THE EFFECTS OF IN-PERSON AND ONLINE HATHA-BASED IYENGAR YOGA PROGRAMS ON PHYSICAL FITNESS, PERCEIVED STRESS, PERCEIVED HEALTH, AND YOGA SELF-EFFICACY AMONG YOUNG HEALTHY ADULT WOMEN

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ÖZLEM ASLAN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
THE DEPARTMENT OF PHYSICAL EDUCATION AND SPORT

JULY 2025

Approval of the thesis:

THE EFFECTS OF IN-PERSON AND ONLINE HATHA-BASED IYENGAR YOGA PROGRAM ON PHYSICAL FITNESS, PERCEIVED STRESS, PERCEIVED HEALTH, AND YOGA SELF-EFFICACY AMONG YOUNG HEALTHY ADULT WOMEN

submitted by **ÖZLEM ASLAN** in partial fulfillment of the requirements for the degree of **Doctor of Philosophy in Physical Education and Sports, the Graduate School of Social Sciences of Middle East Technical University** by,

Prof. Dr. Sadettin KİRAZCI
Dean
Graduate School of Social Sciences _____

Assoc. Prof. Dr. Mustafa SÖĞÜT
Head of Department
Department of Physical Education and Sport _____

Assoc. Prof. Dr. Irmak HÜRMERİÇ ALTUNSÖZ
Supervisor
Department of Physical Education and Sport _____

Examining Committee Members:

Prof. Dr. Settar KOÇAK (Head of the Examining Committee)
Lokman Hekim University
Department of Sport Sciences _____

Assoc. Prof. Dr. Irmak HÜRMERİÇ ALTUNSÖZ (Supervisor)
Middle East Technical University
Department of Physical Education and Sport _____

Prof. Dr. Ayşe KİN İŞLER
Hacettepe University
Department of Exercise and Sport Sciences _____

Prof. Dr. Yeşim ÇAPA AYDIN
Middle East Technical University
Department of Education _____

Assoc. Prof. Dr. Mustafa SÖĞÜT
Middle East Technical University
Department of Physical Education and Sport _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name: Özlem ASLAN

Signature:

ABSTRACT

THE EFFECTS OF IN-PERSON AND ONLINE HATHA-BASED IYENGAR YOGA PROGRAMS ON PHYSICAL FITNESS, PERCEIVED STRESS, PERCEIVED HEALTH, AND YOGA SELF-EFFICACY AMONG YOUNG HEALTHY ADULT WOMEN

ASLAN, Özlem

Ph.D., The Department of Physical Education and Sports

Supervisor: Assoc. Prof. Dr. Irmak HÜRMERİÇ ALTUNSÖZ

July 2025, 261 pages

Following the COVID-19 pandemic, online yoga practices became increasingly popular. This study employed a convergent parallel mixed-methods design to compare the effects of in-person and online Hatha-based Iyengar yoga on physical fitness (strength, balance, flexibility, body composition), perceived health, perceived stress, yoga self-efficacy, and one-year adherence with participants' subjective experiences and perceptions among healthy women aged 18–30

In the quantitative phase, 57 participants (19 per group) completed a quasi-experimental pretest-posttest control group design. The qualitative phase involved semi-structured interviews with 24 participants from the in-person and online groups to explore participants' subjective experiences and perceptions. Quantitative data were analyzed statistically, while qualitative data were examined through inductive thematic analysis.

Significant between-group differences were found in balance (p=.005), perceived stress (p=.02), and perceived health (p=.036). Yoga self-efficacy scores (body,

breath, mind, total) also showed significant group differences. Within-group analysis revealed significant improvements in strength (p=.003), flexibility (p=.001/.03), balance, and perceived stress (in-person: p=.006; online: p=.02) in intervention groups. The control group showed no such gains. A significant association was found between group type and one-year yoga adherence (p=.04).

Participants from both groups reported enhanced physical and psychological well-being, increased self-awareness, and more favorable views toward yoga. Instructional quality, motivation, and environment shaped their experiences. While both formats were beneficial, the in-person format fostered stronger long-term adherence, and the online format was appreciated for convenience and accessibility. Integration of findings confirmed the effectiveness of both yoga approaches in promoting health and self-efficacy.

Keywords: Iyengar yoga, online yoga, in-person yoga, physical fitness, self-efficacy

ÖZ

YÜZ YÜZE VE ÇEVRİMİÇİ HATHA TEMELLİ IYENGAR YOGA PROGRAMLARININ GENÇ SAĞLIKLI YETİŞKİN KADINLARDA FİZİKSEL UYGUNLUK, ALGILANAN STRES, ALGILANAN SAĞLIK VE YOGA ÖZ-YETERLİLİĞİ ÜZERİNDEKİ ETKİLERİ

ASLAN, Özlem

Doktora, Beden Eğitimi ve Spor Bölümü

Tez Yöneticisi: Doç. Dr. Irmak HÜRMERİÇ ALTUNSÖZ

Temmuz 2025, 261 sayfa

COVID-19 pandemisinin ardından, çevrim içi yoga uygulamaları giderek daha popüler hale gelmiştir. Bu çalışma, 18–30 yaş aralığındaki sağlıklı kadın bireyler arasında yüz yüze ve çevrim içi Hatha temelli Iyengar yoga uygulamalarının fiziksel uygunluk (kuvvet, denge, esneklik, vücut kompozisyonu), algılanan sağlık, algılanan stres, yoga öz-yeterliliği ve bir yıllık devamlılık üzerindeki etkilerini; katılımcıların öznel deneyimleri ve algılarıyla birlikte karşılaştırmak amacıyla yakınsak paralel karma yöntem desenini kullanmıştır.

Nicel aşama, 57 katılımcı (her bir grupta 19 kişi) yarı deneysel ön test-son test kontrol gruplu bir tasarım ile tamamlamıştır. Nitel aşamada ise yüz yüze ve çevrim içi gruplardan 24 katılımcıyla yarı yapılandırılmış görüşmeler yapılarak katılımcıların öznel deneyim ve algıları derinlemesine incelenmiştir. Nicel veriler istatistiksel analizle, nitel veriler ise tümevarımsal tematik analiz yoluyla değerlendirilmiştir.

Gruplar arasında denge (p=.005), algılanan stres (p=.02) ve algılanan sağlık (p=.036) açısından anlamlı farklılıklar bulunmuştur. Yoga öz-yeterliliği (beden, nefes, zihin,

toplam) puanları da gruplar arasında anlamlı farklılık göstermiştir. Grup içi analizlerde ise müdahale gruplarında kuvvet (p=.003), esneklik (p=.001/.03), denge ve algılanan stres (yüz yüze: p=.006; çevrim içi: p=.02) açısından anlamlı gelişmeler gözlenmiştir. Kontrol grubunda bu tür iyileşmeler görülmemiştir. Ayrıca, grup türü ile bir yıllık yoga devamlılığı arasında anlamlı bir ilişki saptanmıştır (p=.04).

Her iki grup da fiziksel ve psikolojik iyilik halinde artış, öz-farkındalıkta gelişme ve yoga hakkında daha olumlu görüşler bildirmiştir. Katılımcı deneyimlerini etkileyen başlıca unsurlar eğitimin kalitesi, motivasyon ve uygulama ortamı olmuştur. Her iki format da yararlı bulunurken, yüz yüze uygulamalar uzun vadeli devamlılık açısından daha etkili olmuş; çevrim içi uygulamalar ise erişilebilirlik ve esneklik açısından katılımcılar tarafından tercih edilmiştir. Bulguların bütüncül analizi, her iki yoga yaklaşımının da sağlık ve öz-yeterliliği artırmada etkili olduğunu doğrulamıştır.

Anahtar Kelimeler: Iyengar yoga, çevrimiçi yoga, yüz yüze yoga, fiziksel uygunluk, öz-yeterlilik

To my father and beloved mother

ACKNOWLEDGMENTS

First and foremost, I extend my heartfelt thanks to my advisor, Assoc. Prof. Dr. Irmak HÜRMERİÇ. Without her determination, hard work, and especially her unwavering guidance during a particularly challenging period in my life, this study would not have been completed. I am deeply grateful to Irmak Hocam for never withholding her support at any stage of the process and, on the contrary, for always being by my side with encouragement. I feel truly fortunate to have had the opportunity to work with you, Hocam.

Additional gratitude is extended to Prof. Dr. Settar Koçak. I am grateful to him for sincerely listening to me from the very beginning and encouraging me to join this department, and for urging me to continue during a time I was considering quitting by saying, "*If you quit, I won't give you my blessing*." Although he is at a different university, he has never failed to attend the thesis monitoring committee and offer his support. Settar Hocam, this study would not have been possible without you.

I would also like to extend my sincere thanks to Assoc. Prof. Dr. Mustafa Söğüt. From the very beginning, his trust in me, by granting access to all the laboratory facilities, as well as his contributions to the implementation of the tests and shaping of the study, laid the foundation of this research.

Although I was once on the verge of failing statistics during my undergraduate years, I am deeply grateful to Prof. Dr. Yeşim Çapa Aydın, who taught us statistics with great dedication and patience, reviewed and corrected my analyses multiple times throughout the research process, and offered invaluable insights as a jury member for my thesis.

I also offer my sincere respect and gratitude to Prof. Dr. Ayşe Kin İşler, who kindly accepted to be a jury member and provided valuable feedback and contributions to my thesis.

I would like to thank TÜBİTAK for the financial support provided through Project No. 223K746 under the TÜBİTAK 1002 Rapid Support Program, which enabled the smooth execution of this project.

I would like to express my gratitude to all the participants who joined my study and attended the classes regularly for eight weeks and tests; to dear Derya, Gizem, and İnci, who did not hesitate to help with the tests in response to my emergency calls; to Hilal and Murat for offering their support throughout every stage of the study; to Nil, for her contribution by providing the course schedule; to Sine, who, quite coincidentally, enabled me to start teaching at a studio before the yoga intervention, thereby supporting the development of my teaching practice; and to all the members of the METU PES family who have always stood by me whenever I needed them.

I would also like to thank my valued yoga instructors who helped me develop a love for yoga and made it a part of my life. I extend my deepest gratitude to the great teacher B.K.S. Iyengar, whose passion, discipline, and unique teaching approach continue to inspire us all.

I tried to complete this thesis during one of the most challenging periods of my life. Throughout this process, this thesis has become not only a product of my scientific efforts but also a symbol of resistance that has emerged through a pandemic and three major health crises. Despite all these difficulties, I am deeply grateful to my beloved mother, who continues to stand by my side; who, while fighting her own battle for life, strives to be there for me; whose unwavering presence gives me strength without ever cutting her bond with life. Her patience, perseverance, resilience, resistance, and determination to keep moving forward have been the true sources of inspiration behind this study.

Thank you all.

TABLE OF CONTENTS

PLAGIARISM iii
ABSTRACT iv
ÖZ vi
DEDICATION viii
ACKNOWLEDGMENTS ix
TABLE OF CONTENTS xi
LIST OF TABLES xvi
LIST OF FIGURES xviii
LIST OF ABBREVIATIONS xix
CHAPTERS
1. INTRODUCTION 1
1.1. Background of the Study 1
1.2. Purpose of the Study 4
1.3. Research Questions and Null Hypothesis of the Study 4
1.3.1. Research Questions of the Study 4
1.3.1.1. Between-Group Differences Research Questions 5
1.3.1.2. Within-Group Changes Research Questions 5
1.3.1.3. Qualitative Study Research Question 6
1.3.1.4. Long-Term Adherence Research Question 6
1.3.1.5. Mixed Method Integration Research Question 6
1.3.2. Null Hypothesis of the Study 6
1.3.2.1. The Null Hypothesis of the Study Corresponding to Between-Group Differences Research Questions 7
1.3.2.2. The Null Hypothesis of the Study Corresponding to Within-Group Changes Research Questions 7
1.3.2.3. The Null Hypothesis of the Study Corresponding to Long-Term Adherence Research Question 8
1.4. Significance of the Study 8

1.5. Definition of Terms 10
2. LITERATURE REVIEW 13
2.1. Yoga 13
2.1.1. History of Yoga 13
2.1.2. Definition of Yoga 14
2.1.3. Schools of Yoga 15
2.1.4. Emergence and Key Features of Iyengar Yoga 17
2.1.5. Benefits of Yoga 19
2.1.5.1. Effects on Physical Fitness 20
2.1.5.2. Effects on Perceived Health 22
2.1.5.3. Effects on Perceived Stress 23
2.1.5.4. Effects on Self-Efficacy 24
2.2. Yoga Teaching Methods 26
2.2.1. In-Person Approach to Practising Yoga 26
2.2.2. Online Approach to Practising Yoga 27
2.2.3. Hybrid Approach to Practising Yoga 29
3. METHODOLOGY 31
3.1. Research Design 31
3.2. Data Collection Procedures 32
3.3. Participants 35
3.4. Yoga Intervention Program 40
3.5. Data Collection Instruments 50
3.5.1. Physical Activity Readiness Questionnaire (PAR-Q) 51
3.5.2. Statistical Information Questionnaire 52
3.5.3. Physical Fitness Assessment 54
3.5.3.1. Strength Tests 56
3.5.3.1.1. The Implementation of the Hand Grip Strength Test (HGST) ... 56
3.5.3.1.2. The Implementation of Sit Up Test (One Minute) 58
3.5.3.2. Flexibility Tests 60
3.5.3.2.1. The Implementation of the Sit and Reach Test (SRT): 60
3.5.3.2.2. The Implementation of Back Scratch Test (BST): 63
3.5.3.3. Balance Test 65
3.5.3.3.1. The Implementation of Single Leg Balance Test (SLBT): 66

3.5.3.4. Body Composition 69
3.5.4. Perceived Health Status Scale (PHSS) 71
3.5.5. Perceived Stress Scale (PSS) 71
3.5.6. Yoga Self-Efficacy Scale 72
3.5.7. Qualitative Data Collection Procedures 73
3.5.8. Adherence to Yoga Questionnaire (AYQ) 74
3.6. Data Analysis 75
3.6.1. Quantitative Data Analysis 75
3.6.2. Qualitative Data Analysis 76
3.7. Threats to Internal Validity 77
3.8. Trustworthiness 79
3.9. Researchers Role 80
3.10. Limitations 81
4. RESULTS 83
4.1. Demographics of Participants 83
4.2. Research Questions and Results 90
4.2.1. Between-Group Differences Research Questions and Results 91
4.2.1.1. Research Question and Results Related to Strength 91
4.2.1.2. Research Question and Results Related to Balance 92
4.2.1.3. Research Questions and Results Related to Flexibility 94
4.2.1.4. Research Question and Results Related to Body Composition 95
4.2.1.5. Research Question and Results Related to Perceived Health Status. 96
4.2.1.6. Research Question and Results Related to Perceived Stress 97
4.2.1.7. Research Question and Results Related to Yoga Self-Efficacy 99
4.2.2. Within-Group Changes Research Questions and Results 102
4.2.2.1. Research Question and Results Related to Strength 102
4.2.2.2. Research Question and Results Related to Balance 103
4.2.2.3. Research Question and Results Related to Flexibility 105
4.2.2.4. Research Question and Results Related to Body Composition 107
4.2.2.5. Research Question and Results Related to Perceived Health Status 108
4.2.2.6. Research Question and Results Related to Perceived Stress 109
4.2.2.7. Research Question and Results Related to Yoga Self-Efficacy 110

4.2.3. Qualitative Study Research Question and Results 114
4.2.3.1. Perceived Effects of Yoga Practice 115
4.2.3.2. Challenges and Barriers to Yoga Practice 118
4.2.3.3. Changing Views on Yoga 122
4.2.3.4. Implementation Perception of Yoga Intervention 124
4.2.4. Long-Term Adherence Research Question and Results 127
4.2.5. Mixed Method Integration Research Question and Results 129
5. DISCUSSION 134
5.1. Interpretation of The Quantitative Data Results 134
5.1.1. Strength 134
5.1.2. Balance 136
5.1.3. Flexibility 138
5.1.4. Body Composition 140
5.1.5. Perceived Health 141
5.1.6. Perceived Stress 143
5.1.7. Self-Efficacy 144
5.1.8. Adherence to Yoga 146
5.2. Interpretation of The Quantitative Data Results 147
5.2.1. Perceived Effects of Yoga Practice 147
5.2.2. Challenges and Barriers to Yoga Practice 148
5.2.3. Changing Views on Yoga 149
5.2.4. Implementation Perception of Yoga Intervention 151
5.3. Suggestions for Future Research 155
REFERENCES 157
APPENDICES
A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE 209
B. GUIDELINES FOR TEST PREPARATION 212
C. QUALITATIVE DATA COLLECTION QUESTIONNAIRE 215
D. STATISTICAL INFORMATION FORM 216
E. PERCEIVED HEALTH STATUS SCALE 219
F. ALGILANAN STRES ÖLÇEĞİ 220
G. PERCEIVED STRESS SCALE 221
H. YOGA ÖZ-YETERLİLİK ÖLÇEĞİ (Turkish Adaptation) 222

I. YOGA SELF-EFFICACY SCALE (Original English Version) 223
J. HERKES İÇİN EGZERSİZE HAZIRBULUNUŞLUK ANKETİ (EGZ-A+) / PHYSICAL ACTIVITY READINESS QUESTIONNAIRE (PAR-Q) 224
K. CONSENT FORM 230
L. 8 WEEKS YOGA PROGRAM 233
M. ADHERENCE TO YOGA QUESTIONNAIRE (AYQ) 236
N. DESCRIPTIVE SUMMARY OF WITHIN-GROUP PRE-POST CHANGES 237
O. OVERALL RESULTS OF QUANTITATIVE DATA 239
P. ATTENDANCE LIST 240
R. FIDELITY OF INTERVENTION CHECKLIST (IN-PERSON AND ONLINE) 242
S. CURRICULUM VITAE 243
T. TURKISH SUMMARY / TÜRKÇE ÖZET 244
S. THESIS PERMISSION FORM / TEZ İZİN FORMU 261

LIST OF TABLES

Table 2.1. Eight Limbs of Patanjali's Yoga 15
Table 3.1. Overview of Data Collection Instruments and Testing Timeline by Group 34
Table 3.2. Demographics of Participants (N=57) 37
Table 3.3. Socio-Economic Conditions of Participants (N=57) 38
Table 3.4. Overview of the Yoga Intervention Program Structured by Group 40
Table 3.5. Example of the First Two Weeks of the Eight-Week Yoga Program 42
Table 3.6. Comparative Overview of In-Person and Online Yoga Programs 43
Table 3.7. Instruments Used for Quantitative and Qualitative Data Collection 50
Table 3.8. Internal Validity Threats Summary 77
Table 4.1. Participant Habits Practiced Four or More Days Per Week 84
Table 4.2. Participants' Self-Reported Personal Barriers to Engaging in Physical Activity 85
Table 4.3. Participants' Self-Reported Emotional and Psychological Barriers to Engaging in Physical Activity 86
Table 4.4. Participants' Self-Reported Environmental Barriers to Engaging in Physical Activity 87
Table 4.5. Participants' Self-Confidence Levels in Making a Behaviour Change or Developing a New Behaviour 89
Table 4.6. In-Person and Online Education Experience Ratings of Participants 90
Table 4.7. Kruskal-Wallis H Test Results for Strength Tests Across Groups 91
Table 4.8. Kruskal-Wallis H Test Results for Balance Across Groups 92
Table 4.9. Pairwise Comparison of Groups among DLEO 93
Table 4.10. Kruskal-Wallis H Test Results for Flexibility Tests Across Groups 94
Table 4.11. Kruskal-Wallis H Test Results for Body Composition Across Groups . 95
Table 4.12. Chi-square Test Results for Perceived Health Status (Pre-and Post-Test) 96
Table 4.13. Distribution of Perceived Health Status at Post-Test by Group 97

Table 4.14. Kruskal-Wallis H Test Results of Perceived Stress Across Groups 98
Table 4.15. Pairwise Comparison of Groups 98
Table 4.16. Kruskal-Wallis Test Results for Yoga Self-Efficacy Subscale 99
Table 4.17. The Pairwise Comparison of Groups Under Dimensions of Yoga Self-Efficacy 101
Table 4.18. Comparison of Strength Test Results Across Groups 102
Table 4.19. Comparison of Balance Test Results Across Groups 103
Table 4.20. Comparison of Flexibility Tests Results Across Groups 105
Table 4.21. Comparison of Body Composition Across Groups 107
Table 4.22. Chi-Square Results for Perceived Health Change 109
Table 4.23. Comparison of Perceived Stress Results Across Groups 109
Table 4.24. Comparison of Yoga Self-Efficacy Results Across Groups 110
Table 4.25. Thematic Coding of Perceived Effects of Yoga Practice 115
Table 4.26. Thematic Coding of Challenges and Barriers to Yoga Practice 118
Table 4.27. Thematic Coding of Participants' Views on Changing Views on Yoga 122
Table 4.28. Thematic Coding of Implementation Perception of Yoga Intervention 124
Table 4.29. Yoga Adherence Summary by Group 127
Table 4.30. Initiation of a New Sport Activity Within the Past Year 128
Table 4.31. Integrated Results on Physical Fitness Parameters 129
Table 4.32. Integrated Results on Perceived Stress, Perceived Health, and Yoga Self-Efficacy 131

LIST OF FIGURES

Figure 2.1. Schools of Yoga (Nalbant et al., 2022) 16
Figure 2.2. Exploring the Multifaceted Benefits of Yoga 20
Figure 2.3. Components of Social Cognitive Theory (Bandura, 2005) 25
Figure 3.1. Key Features of the Convergent Parallel Design 32
Figure 3.2. Data Collection Procedures in the Study 33
Figure 3.3. Participant Enrollment and Intervention Completion Flowchart 37
Figure 3.4. Hand Grip Strength Test Demonstration 57
Figure 3.5. One-Minute Sit-Up Test Demonstration (OpenAI, 2025) 59
Figure 3.6. Sit-and-Reach Test Demonstration (OpenAI, 2025) 62
Figure 3.7. The Back-Scratch Test Demonstration (OpenAI, 2025) 64
Figure 3.8. Single Leg Balance Test Implementation (OpenAI, 2025) 67
Figure 3.9. Body Composition Test Implementation (OpenAI, 2025) 70
Figure 3.10. Measuring Height Implementation (OpenAI, 2025) 70
Figure 4.1. Within Group Percentage Change with Estimated Standard Deviations (Across Physical Fitness Parameters and Body Composition) 113
Figure 4.2. Within Group Percentage Change with Estimated Standard Deviations (Across Perceived Stress, Perceived Health, and Yoga Self-Efficacy) 113

LIST OF ABBREVIATIONS

ACSM	American College of Sports Medicine
AYQ	Adherence to Yoga Questionnaire
AYQ	Adherence to Yoga Questionnaire
BC	Before Christ
BCE	Before Common Era
BFP	Body Fat Percentage
BST	Back Scratch Test
BMI	Body Mass Index
BKS	Bellur Krishnamachar Sundararaja
CI	Confidence Interval
COVID-19	Coronavirus Disease of 2019
DLEO	Dominant Leg Eyes Open
DLEC	Dominant Leg Eyes Closed
EGZ-A+	Herkes için Egzersize Hazırbulunuşluk Anketi
HGST	Hand Grip Strength Test
IBM	International Business Machines Corporation
ICC	Intraclass Correlation Coefficient
METU	Middle East Technical University
Non-DLEO	Non-Dominant Leg Eyes Open
Non-DLEC	Non-Dominant Leg Eyes Closed
PAR-Q	Physical Activity Readiness Questionnaire
PHSS	Perceived Health Status Scale
PHSQ	Perceived Health Status Questionnaire
PSS	Perceived Stress Scale
RIMYI	Ramamani Iyengar Memorial Yoga Institute
SCT	Social Cognitive Theory
SLBT	Single Leg Balance Test
SPSS	Statistical Package for the Social Sciences

SRT	Sit and Reach Test
TÜBİTAK	The Scientific and Technological Research Council of Türkiye
TÜBİTAK-1002	A Rapid Support Program financed by TÜBİTAK
YSES	Yoga Self-Efficacy Scale
YDEÖ	Yoga Dönüşüm Etkisi Ölçeği
YSEQ	Yoga Self-Efficacy Questionnaire

CHAPTER 1

INTRODUCTION

This chapter provides an overview of the study's background, purpose, and significance. It concludes with the research questions and hypotheses, along with definitions of key terms used in the study.

1.1. Background of the Study

Over the past several years, yoga has emerged as a significant mind-body intervention that integrates a person's physical, mental, and spiritual dimensions to improve overall well-being (Büssing et al., 2012; Feuerstein, 2001). Founded in ancient Indian philosophical schools and practiced for thousands of years, yoga has long integrated physical yoga poses (asanas), regulated breath exercises (pranayama), and meditations to encourage body-mind harmony (Feuerstein, 2001; Iyengar, 1988; Mohanty, 2020). Over the years, this traditional practice has transcended cultural and geographical boundaries and is now widely adopted worldwide as a valuable means to promote physical well-being, reduce stress, and enhance psychological resilience (Gard et al., 2012; Ross et al., 2010; Yoshihara et al., 2014).

Numerous studies have demonstrated that regular yoga practice helps reduce stress, improve mood, and enhance self-efficacy (Büssing et al., 2012b; Cohen et al., 1983). It also promotes healthy habits and enhances body image, particularly in women (Neumark-Sztainer et al., 2018). This matter because poor body image is linked to anxiety and depression (Bucchianeri et al., 2013). Yoga is also helpful for people with obesity, improving both stress levels and quality of life (Lauche et al., 2016; Telles et al., 2019). Overall, yoga builds both physical and mental strength.

Beyond its psychological benefits, yoga plays a significant role in physical well-being. Research consistently indicates that yoga can positively influence various health-related physical fitness parameters, including muscular strength, cardiovascular endurance, flexibility, and body composition (Ross et al., 2010; Tran et.al, 2001). It can also contribute to skill-related attributes such as balance, coordination, and agility—components often linked to injury prevention, functional autonomy, and overall quality of life (Gonçalves et al., 2011; Jeter et al., 2015; Woodyard, 2011). Therefore, yoga can significantly enhance both skill-related and health-related aspects (Büssing et al.,2012b; Lau et al., 2015; Roland et al., 2011; Ross et al., 2010; Woodyard, 2011). These benefits are frequently attributed to the demands on postural control and proprioception inherent in yoga postures, in conjunction with the concentrated attention and structured breathing techniques that collectively facilitate enhanced mind and body integration (Büssing et al., 2012; Balasubramaniam et al., 2013)

It is evident that studies on yoga have been conducted with a wide range of participant groups (Cramer et al., 2014). However, young women can be considered as a special participant group in studies on health because they experience unique physiological and psychological challenges, such as hormonal fluctuations, higher rates of stress and anxiety, and societal pressures, which make them more susceptible to mental health issues and lifestyle-related diseases (Matud, 2004; Riley et al., 2015). Additionally, they are at a life stage where establishing healthy habits can have long-term benefits for their overall well-being (Dishman et al., 2013). With an emphasis on both physical action and mindfulness, yoga is an effective way to address these issues in young adult women. Furthermore, it has been shown to reduce perceived stress, which is particularly relevant for young adult women coping with educational, professional, and personal stress (Shohani et al., 2018). By improving physical fitness, creating a positive body image, and developing psychological resilience, yoga can potentially empower young adult women with effective coping mechanisms for handling the social, educational, and occupational demands of their world (Neumark-Sztainer et al., 2018).

One of the most accessible and widely practiced styles, Hatha yoga is also the most frequently referenced in the literature. Hatha yoga is a form of yoga that includes yoga

poses (asanas), breathing techniques (pranayama), and meditation, with an emphasis on achieving balance between the body and mind (Feuerstein, 2008). Iyengar yoga is a hatha-yoga discipline developed by Bellur Krishnamachar Sundararaja (B.K.S) Iyengar. Analyzing the practice of hatha-based Iyengar yoga is another essential aspect of the research. Iyengar yoga is a type of hatha yoga that differs from the rest because of its progressive approach to alignment, the use of props, and the sequence of poses practiced. This feature makes it especially suitable for individuals with varying levels of physical capability and experience **(**Iyengar**,** 2005). Its flexibility and scientific approach, along with its emphasis on body awareness, offer a disciplined framework for analyzing both psychological and physical advantages (Kolasinski et al., 2005). This makes Iyengar yoga a suitable option for examining its impact on self-efficacy, perceived stress, physical fitness, and general health.

Understanding the various methods of practicing and teaching yoga is crucial for developing effective and well-structured yoga programs. Yoga has traditionally been taught in-person, with the teacher and student sharing the same physical space. However, with technology advancing in recent years, along with increased connectivity to the web, the mode of delivery for yoga practice has undergone significant changes. The COVID-19 pandemic had a significant impact on the practice method of yoga. At the time when the COVID-19 pandemic disrupted all forms of education, the world began working remotely, utilizing online platforms for emergency remote teaching (Agormedah et al., 2020; Patel & Patnaik, 2021). Online teaching was a more accessible method of alternative teaching compared to in-person teaching in classrooms, particularly during crises like the COVID-19 pandemic, which necessitated social distancing protocols (Dhawan, 2020). These internet channels are increasingly popular with young adults who usually balance the demands of studies and work (Nandlall et al., 2022). As a result of these technological advancements, yoga has undergone significant evolution. Since the online yoga channel is a cost-effective way to connect with clients, many yoga instructors and schools have begun adopting it (Jagannathan et al., 2021). Online yoga classes, thus, began as a novel idea for academic researchers (Jagannathan et al., 2021; James et al., 2022; Strömberg et al., 2021). Despite the numerous findings on online yoga practice, concerns persist

regarding its effectiveness in promoting psychological and physical well-being compared to in-person yoga practice (Suman et al., 2021; Telles et al., 2020).

As a result, the mode of yoga practices—in-person or online—may also significantly affect its advantages. Considering this, the present study aims to investigate the comparative effects of in-person and online yoga programs on physical fitness, perceived stress, perceived health, and self-efficacy in yoga among young adult women, as well as adherence to yoga. The findings of this study will enhance the existing body of knowledge on the effectiveness of online health interventions and provide valuable insights for yoga practitioners and health professionals. By evaluating the outcomes, this research aims to assess the efficacy and comparative advantages of in-person and online yoga delivery modes in fostering physical and psychological well-being, thereby informing evidence-based recommendations for yoga practices specifically designed for this population.

1.2. Purpose of the Study

The primary aim of this study was to compare the effects of in-person and online hatha-based Iyengar yoga programs on various variables: physical fitness components (strength, balance, flexibility, body composition), perceived health status, perceived stress levels, yoga self-efficacy, and adherence to yoga practice among healthy young adult women aged 18 to 30. Additionally, the study aimed to explore participants' perceptions and personal experiences regarding the effects of in-person and online yoga practices through a qualitative approach.

1.3. Research Questions and Null Hypothesis of the Study

Following the purpose of the study, the main research questions guided this study, and subsequently, the hypotheses were formulated.

1.3.1. Research Questions of the Study

This study aims to address five distinct research questions: The first part of the research question concerns whether there are significant differences between the groups regarding the study variables. The second examines whether the variables

exhibit significant changes from the pre-test to the post-test within each group. The third part focuses on participants' subjective experiences and perceptions derived through qualitative analysis. The fourth part investigates adherence to yoga practice over one year, based on two different programs (in-person and online). Lastly, the fifth research question, which is a mixed-methods research question of this study, aims to integrate quantitative variables and qualitative insights.

1.3.1.1. Between-Group Differences Research Questions

RQ-1: Is there a significant difference among the intervention group (in-person and online yoga group) and the control group in ***physical fitness parameters [(a) strength, (b) balance, (c) flexibility, and (d) body composition]*** after an 8-week hatha-based Iyengar yoga program?

RQ-2: Is there a significant difference among the intervention group (in-person and online yoga group) and the control group in ***perceived health status*** after an 8-week hatha-based Iyengar yoga program?

RQ-3: Is there a significant difference among the intervention group (in-person and online yoga group) and the control group on ***perceived stress*** after an 8-week hatha-based Iyengar yoga program?

RQ-4: Is there a significant difference among the intervention group (in-person and online yoga group) and the control group regarding ***yoga self-efficacy*** after an 8-week hatha-based Iyengar yoga program?

1.3.1.2. Within-Group Changes Research Questions

RQ-5: Is there a statistically significant change in ***physical fitness parameters [(a)strength, (b)balance, (c)flexibility, and (d)body composition]*** within each group (in-person yoga group, online yoga group, and control group) from pre-test to post-test?

RQ-6: Is there a statistically significant change in ***perceived health status*** within each group (in-person yoga group, online yoga group, and control group) from pre-test to post-test?

RQ-7: Is there a statistically significant change in ***perceived stress*** within each group (in-person yoga group, online yoga group, and control group) from pre-test to post-test?

RQ-8: Is there a statistically significant change in ***yoga self-efficacy*** within each group (in-person yoga group, online yoga group, and control group) from pre-test to post-test?

1.3.1.3. Qualitative Study Research Question

RQ-9: How do young adult women participants perceive and experience the effects of in-person and online yoga practices on their physical fitness, perceived health, perceived stress, and yoga self-efficacy?

1.3.1.4. Long-Term Adherence Research Question

RQ-10: Is there a significant difference ***in yoga adherence*** (i.e., not practicing, occasional practice, regular practice, etc) between participants who engaged in in-person versus online yoga practices during the one year following the completion of the intervention?

1.3.1.5. Mixed Method Integration Research Question

RQ-11: How do we combine quantitative and qualitative findings to explain the effects of yoga intervention?

1.3.2. Null Hypothesis of the Study

The hypotheses were structured according to the corresponding research questions: the null hypothesis for the between-group differences research questions, the null

hypothesis for the within-group change research questions, and the null hypothesis for the long-term adherence research question. No hypotheses were formulated for the qualitative and mixed-method research questions, as these components are exploratory and do not involve hypothesis testing.

1.3.2.1. The Null Hypothesis of the Study Corresponding to Between-Group Differences Research Questions

H_0-1: There is no statistically significant difference in ***physical fitness parameters [(a)strength, (b)balance, (c)flexibility, and (d)body composition]*** among the in-person, online, and control groups following the 8-week hatha-based Iyengar yoga intervention. (**H_0:** $\mu1 = \mu2 = \mu3$)

H_0-2: There is no statistically significant difference in ***perceived health*** status among the in-person, online, and control groups following the 8-week hatha-based Iyengar yoga program. (**H_0:** $\mu1 = \mu2 = \mu3$)

H_0-3: There is no statistically significant difference in *perceived stress among* the in-person, online, and control groups following the 8-week hatha-based Iyengar yoga program. (**H_0:** $\mu1 = \mu2 = \mu3$)

H_0-4: There is no statistically significant difference in *yoga self-efficacy* status among the in-person, online, and control groups following the 8-week hatha-based Iyengar yoga program. (**H_0:** $\mu1 = \mu2 = \mu3$)

1.3.2.2. The Null Hypothesis of the Study Corresponding to Within-Group Changes Research Questions

H_0-5: The null hypothesis (H_0) states that there is no statistically significant change in ***physical fitness parameters [(a)strength, (b)balance, (c)flexibility, and (d)body composition)]*** from pre-test to post-test within each group (in-person yoga, online yoga, and control) (**H_0:** $md=0$)

H_0-6: The null hypothesis (H_0) states that there is no statistically significant change in ***perceived health status*** from pre-test to post-test within each group (in-person yoga, online yoga, and control) (**H_0:** *md*=0)

H_0-7: The null hypothesis (H_0) states that there is no statistically significant change in ***perceived stress*** from pre-test to post-test within each group (in-person yoga, online yoga, and control) (**H_0:** *md*=0)

H_0-8: The null hypothesis (H_0) states that there is no statistically significant change in ***yoga self-efficacy*** from pre-test to post-test within each group (in-person yoga, online yoga, and control) (**H_0:** *md*=0)

1.3.2.3. The Null Hypothesis of the Study Corresponding to Long-Term Adherence Research Question

H_0-9: The null hypothesis (H_0) states that there is no statistically significant difference in yoga adherence (i.e., not practicing, occasional practice, regular practice) between participants who engaged in in-person yoga practices and those who engaged in online yoga practices during the one-year following the completion of the intervention (H_0: $\mu 1=\mu 2$).

1.4. Significance of the Study

The importance of the study lies in its ability to address gaps in existing research with the presence of a control group on the comparative effects of in-person and online hatha-based Iyengar yoga program on physical fitness components (strength, balance, flexibility, and body composition), perceived health status, perceived stress levels, self-efficacy in yoga, adherence to yoga practice and personal experience among the effects of in-person and online yoga programs among healthy young adult women aged 18 to 30.

An additional significance of this study lies in the choice of young adult women as the target population for the intervention. Young adult women face unique challenges such

as stress, hormonal fluctuations, and societal pressures that can impact their physical and mental well-being. Additionally, they are at a critical stage in establishing long-term health behaviors. The change in well-being among young adult women can also impact their families and the health of their communities (Dishman, Heath, & Lee, 2013; Matud, 2004).

Another important aspect of this study is its focus on both in-person and online yoga programs. Online exercise formats have become increasingly popular, particularly following the COVID-19 pandemic, which highlighted the need for accessible, flexible, and home-based health interventions. (Brosnan et al., 2021; Jasti et al., 2020). Since then, many studies have examined the effectiveness of online exercise on various physical and psychological outcomes. While international research has demonstrated the benefits of both in-person and online yoga practices, few studies have directly compared these delivery methods (Brinsley et al., 2021; Şaşmaz, 2022; Ulusal Tez Merkezi | Anasayfa, n.d.; Uysal, 2022), making this study a valuable contribution to both national and global literature.

Another important contribution of this study is its focus on yoga as the intervention method. It is a holistic practice that integrates physical movement, breath regulation, and mindfulness, promoting both physiological and psychological well-being. Therefore, yoga is a highly popular subject in the current literature and continues to gain increasing attention, including in Turkey across different subjects (Çetinoğlu & Pehlivan, 2024; Göl, 2025).

Another significance of the research is that no study to date has compared in-person and online programs in terms of both physical (balance, flexibility, strength, body composition) and psychological (perceived stress, health, self-efficacy, adherence) outcomes. Online yoga has been studied primarily in the context of psychological subjects, stress, and chronic pain, with most studies focusing on the safety and effectiveness of online programs (Günebakan et al., 2022; Malik et al., 2022; Nongkhai et al., 2022). There are very few studies that choose physical parameters in the context of body composition, balance, strength, and the 6-minute walk (Nongkhai et al., 2022; Mehta et al., 2017; Park et al., 2022). No studies have been found that

compare both physical and psychological subjects together, examining in-person and online programs.

This study compares in-person and online yoga programs to demonstrate the importance of offering flexible and accessible programs. At the individual level, the results can support personalized guidance depending on whether a person's needs are physical or psychological. On a broader scale, the findings can inform health policymakers, fitness professionals, and digital health designers in developing more effective and engaging yoga programs that support long-term participation.

1.5. Definition of Terms

Yoga: Yoga is an ancient mind-body practice originating in India that promotes overall health and well-being. The word 'Yoga' is derived from the Sanskrit root 'yuja', meaning 'to unite' or 'to integrate'. It is the practice that fosters harmony between the body, mind, and spirit, enabling one to live a peaceful life (Büssing et al., 2012b; Feuerstein, 2001; Singh, 2022).

Hatha Yoga: It is a form of yoga that incorporates yoga poses (asanas), breathing techniques (pranayama), and meditation, focusing on achieving balance between the body and mind (Feuerstein, 2008).

Iyengar Yoga: Iyengar yoga, a different variety of hatha yoga, is a specific style of yoga developed by B.K.S. Iyengar, a renowned yoga teacher from India (Baghel, 2021). It is characterized by its emphasis on precise physical alignment within yoga poses (asanas) and the use of props such as belts, blocks, and blankets to assist practitioners (Shapiro et al., 2004; Speed-Andrews et al., 2012).

Online Yoga: Online yoga is a form of yoga that is delivered over the internet. It includes teaching yoga poses, breathing practices (pranayama), and relaxation techniques using cloud technology to connect one source (the trainer's venue) to multiple video conferencing centers (participants' homes) via online software such as "Skype" and "Zoom" (Brinsley et al., 2021).

In-Person Yoga: In-person yoga refers to the traditional method of practicing yoga, where students attend courses in a physical studio or other group setting with a yoga instructor.

Yoga Self-Efficacy: Yoga self-efficacy refers to an individual's belief in their ability to perform yoga postures and practices effectively. It is a measure of one's confidence in their ability to practice yoga, and it can significantly impact their overall experience with yoga (Birdee et al., 2017). When someone has high yoga self-efficacy, they are more likely to approach yoga practice with a positive attitude. They are more likely to persist in their practice, even in the face of challenges or obstacles On the other hand, low yoga self-efficacy can lead to feelings of discouragement, frustration, and avoidance of yoga practice (Birdee et al., 2017; Campbell et al., 2019; Nicosia et al., 2020).

Perceived Health Status: Perceived health status is an individual's assessment of their overall health, encompassing physical, mental, and social well-being. While it may not always correspond with objectively measured health indicators, it serves as a valuable and clinically significant measure (McHugh et al., 2013).

Perceived Stress: Perceived stress refers to an individual's subjective view of the stress they feel in daily life. This idea is based on how a person assesses the intensity, frequency, and length of stressful events. Perceived stress not only considers evaluating stressful life events but also how stressful those situations seem; therefore, it is an important predictor of life satisfaction (Lee et al., 2016).

Physical Fitness: Physical fitness refers to an individual's ability to perform daily tasks efficiently and safely without fatigue, as well as their capacity to engage in physical activities. The components of physical fitness consist of subcategories of skill-related and health-related components. Skill-related fitness includes power, balance, coordination, speed, and reaction speed (Apriani et al., 2020; Sumaryanti et al., 2018). Health-related fitness, on the other hand, involves cardiovascular endurance, muscular strength, muscle endurance, body composition, and flexibility (Apriani et al., 2020; Yusuf et al., 2020).

Body composition: It is one of the five key components of health-related physical fitness (Hart, 2017). It refers to the amounts of fat, muscle, and bone in the body (Stodden et al., 2015). Body composition is important because it can significantly impact an individual's performance in physical fitness tests, particularly those involving muscle strength and movement (Plowman, 2014). It also plays a role in overall health and can influence various health outcomes (Heyward, 2006).

CHAPTER 2

LITERATURE REVIEW

The chapter describes the literature review for the study. It provides an overview of the history and definition of yoga, offering accounts of the various major schools and types of yoga, with a particular focus on Iyengar yoga. This was followed by an overview of earlier work on the benefits of yoga and its impacts on the primary outcome measures that are the focus of this study.

The section on yoga teaching and practicing methods begins by assessing the principles of traditional yoga instruction methods. It then proceeds to the historical developments of yoga training, both in-person and online, and describes the pros and cons of these methods. The reason for not including hybrid yoga education in this study is clearly explained. Finally, the chapter concludes with a summary of the main points from the literature, which serves as the basis for the subsequent chapters of the study.

2.1. Yoga

2.1.1. History of Yoga

The origins of yoga date back thousands of years. Some historians believe yoga began around 5000 B.C., while others suggest it began around 2700 B.C. during the Pre-Vedic period (Maity et al., 2021). The Vedas, which were written between 1500 and 500 B.C.E., are the oldest known written accounts of yoga. These texts, which include hymns, prayers, and rituals, were first passed down verbally before being written (Flood, 2003; McGonigal, 2010). The Vedas describe yoga as a way to reach spiritual awareness and physical well-being (Feuerstein, 1999; Kushwaha et al.,

2021). Practices like meditation, breath control, and ethical rules (Yamas) are also mentioned in the Vedas. These Vedas are: Rigveda, Yajurveda, and Atharvaveda (Singh et al., 2020; Shah et al., 2023).

Besides the Vedas, many classical texts discuss yoga, including Yoga Vasistha, Hatha Yoga Pradipika, Gheranda Samhita, and Siva Samhita (Feuerstein, 2001). Ancient Tamil texts and the Nepalese Dharmaputrikā Saṃhitā also cover yogic practices (Barois, 2020). Among these, the Yoga Sutras of Patanjali are the most important. Patanjali is recognized as the founder of formal yoga philosophy. He lived around the second century and organized yoga into eight steps, emphasizing the mind (Sharma et al., 2018; Varambally et al., 2016). His 196 sutras offer clear guidance on overcoming physical and mental issues for spiritual growth (Suriyaprakash et al., 2014).

Over time, yoga developed into a comprehensive system of philosophy and lifestyle. Its aim is to balance the body, mind, and soul. Today, yoga is seen not only as a spiritual path but also as a way to improve health and promote healing (Desikachar et al 2005).

2.1.2. Definition of Yoga

The word "yoga" comes from the Sanskrit root "yuj," meaning "union" or "to join" (Feuerstein, 1999; Iyengar, 1988). It refers to the connection between the body, mind, and soul, as well as the unification of the individual self with the divine (Kalimuthu, 2022; White, 2022). Iyengar (1988) described this unity as three pillars of yoga: physical postures (yoga poses or asanas), breathing techniques (pranayama), and meditation, each offering physical, mental, and spiritual benefits (Mohanty, 2020; The Significance of the Asanas and Pranayamas, 2022). Yoga combines movement, breath, and mindfulness, creating a holistic mind-body practice (Gothe et al., 2019). The Bhagavad Gita, a sacred text, describes yoga as both mental balance and skillful action in life (Kawari, 2018).

Patanjali systematized the philosophy and structure of yoga in the Yoga Sutras, a classical text containing 196 aphorisms (Iyengar, 1993). These teachings aim to help individuals overcome mental and physical distractions on the path to spiritual

development (Soni, 2010). Table 2.1 presents Patanjali's eight limbs of yoga, which are widely regarded as a step toward achieving self-realization (Ali, 2010; Iyengar, 2001).

Table 2.1. Eight Limbs of Patanjali's Yoga

Stages	Explanation
Yama	Ethical disciplines or universal moral commandments
Niyama	Self-purification by discipline
Asana	Posture/Poses
Pranayama	Rhythmic control of the breath
Pratyahara	Withdrawal and emancipation of the mind from the domination of the senses and exterior objects
Dharana	Concentration
Dhyana	Meditation
Samadhi	A state of super consciousness brought about by profound meditation

Note. Adapted from "Astadala Yogamala Volume 2" by Iyengar, BKS, 2001, Allied Publisher Private Limited

Each of the eight limbs of yoga has a unique purpose in guiding the practitioner. *Yama* includes ethical rules such as non-violence, truthfulness, and non-possessiveness (Büssing&Beerenbrock, 2021; Nanthakumar, 2022; Paudel, 2023). *Niyama* emphasizes personal discipline, encompassing purity, contentment, and self-study (Nanthakumar, 2022). *Asana* refers to physical postures for strength and health, while *Pranayama* involves breathing techniques to connect the body and mind. Pratyahara refers to controlling the senses, while Dharana and Dhyana relate to concentration and meditation, respectively, which help improve focus and mental clarity. *Samadhi* is the final stage, characterized by a profound state of spiritual unity and enlightenment. Understanding these eight limbs can support the use of yoga in therapy, helping individuals maintain mental and physical balance, grow in self-awareness, and move toward spiritual well-being (Iyengar, 2001; Lacasse et al., 2019; Paudel, 2023; Singh, 2022; Schmid et al., 2021; Woodyard, 2011;).

2.1.3. Schools of Yoga

Yoga is a vast and diverse system that encompasses various practices and paths to spiritual realization and self-discovery. Different types of yoga serve the varying needs and tendencies of individuals. These include: hatha, raja, bhakti, jnana, karma, mantra,

and kundalini yoga (Nalbant et al., 2022). Figure 2.1 illustrates the seven primary branches or schools of yoga, each with its distinct focus and approach.

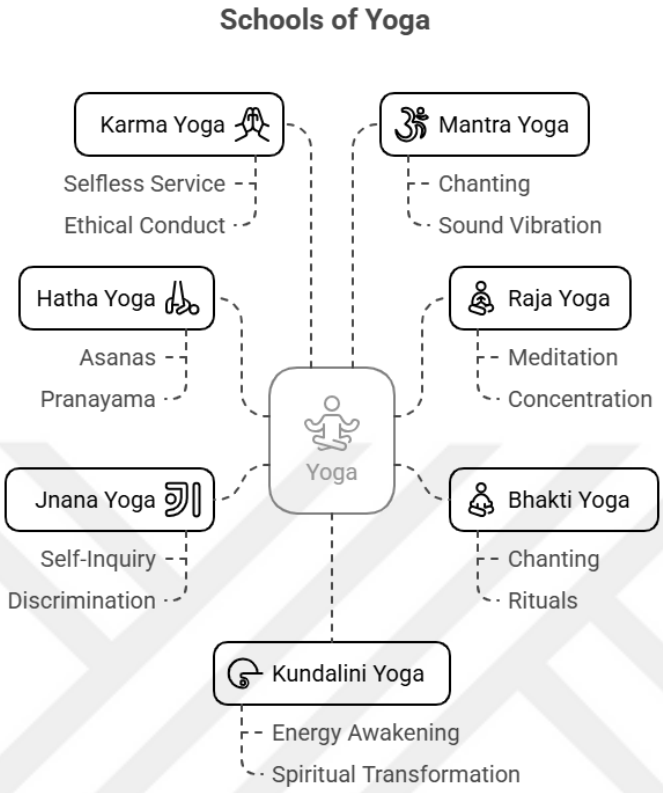


Figure 2.1. Schools of Yoga (Nalbant et al., 2022)

Hatha yoga is a branch of yoga that emphasizes physical poses (asanas), breathing techniques (pranayama), and meditation. It is the most popular style of yoga practiced in the West and includes various sub-styles such as Iyengar, Kundalini, Bikram, Ananda, Vinyasa, and Anusara (Khanna & Greeson, 2013). Raja yoga, also known as the "royal path," emphasizes meditation and mental control. It involves practices such as concentration, meditation, and self-discipline (Menezes et al, 2015). Bhakti Yoga is a form of yoga that emphasizes devotion and surrender to a higher power. It is a part of yoga philosophy and involves practices that cultivate a sense of connection and dedication to a Supreme or Higher power (Telles et al., 2009). Jnana Yoga is a form of yoga that focuses on knowledge and wisdom. It involves cultivating intellectual knowledge and understanding to attain spiritual enlightenment. Karma Yoga is a form of yoga that emphasizes selfless action and service to others. Karma Yoga involves performing actions without attachment to the results and with a sense of duty and

service. Mantra Yoga is a type of yoga that involves the repetition of sacred sounds, words, or phrases known as mantras. It is a practice that combines sound, vibration, and intention to focus the mind and cultivate a state of inner peace and spiritual connection. Kundalini Yoga is a form of yoga that focuses on awakening the dormant spiritual energy within the body, known as Kundalini. It involves a combination of physical postures, breathing techniques, chanting, meditation, and mantra repetition to activate and raise the Kundalini energy (Feuerstein, 2001).

Hatha yoga, a form of yoga chosen in this study, focuses on physical postures and offers solid support for academic research, resulting in its prevalence in the literature. The fact that hatha yoga is based on physical postures contributes to its prevalence in academic studies. As mentioned above, Hatha yoga's emphasis on physical movements and postures makes it a tangible and measurable intervention, which aligns well with the scientific approach of academic research (Büssing et al., 2012b). This enables researchers to objectively evaluate the impact of hatha yoga on various health outcomes, including mental health and physical fitness (Cramer et al., 2013; Ross & Thomas, 2010). Additionally, the physical nature of hatha yoga makes it accessible and appealing to a wide range of individuals, making it a popular choice for research studies (Ross & Thomas, 2010).

2.1.4. Emergence and Key Features of Iyengar Yoga

Before studying Iyengar yoga individually, it is essential to understand the significant factors that influenced its development. Yoga has evolved due to historical, cultural, personal, and social development. With the expansion into other regions, it was developed based on local needs, leading to the emergence of many styles. Below, the major factors that influence the emergence of new yoga styles are explained.

Historical and Cultural Influences: Yoga evolved as other cultures and philosophies influenced it. Teachers and gurus helped form different styles based on their experience (Arnet, 2023).

Individual Preferences: People choose types of yoga based on their goals. Some prefer vigorous styles, such as Ashtanga, while others favor more passive styles, like

Yin Yoga. Props are sometimes used for treatment and support in Iyengar Yoga (Baghel, 2021; Birdee et al., 2017).

Adaptation to Needs: Yoga has been modified for various groups, like the elderly, athletes, or pregnant women, to make it more inclusive (Cartwright et al., 2020; Neumark-Sztainer et al., 2018).

Teaching Traditions: Indian gurus preserved the yoga tradition and developed modern styles, including Iyengar, Ashtanga, Kundalini, and Bikram Yoga, which are still applied in the modern world today (Innes & Selfe, 2016; Maity et al., 2021; Telles et al., 2017).

Integration with Other Practices: Various forms have been developed through the fusion of yoga with other practices, such as dance, pilates, or martial arts.

This section explores the reasons for choosing Iyengar yoga. The choice of Iyengar yoga for this study is based on several key features that distinguish it from other styles and support its effectiveness in structured health interventions, including:

1. **Emphasis on precise physical alignment:** Iyengar yoga places a strong emphasis on precise physical alignment in each pose to prevent injury and reduce strain. Proper alignment activates the right muscles, promoting balance, strength, and stability (Rajendran & Sethuraman, 2023). Physical alignment in yoga poses also helps cultivate a deeper connection between the mind and body. By focusing on alignment cues and bodily sensations, practitioners can cultivate greater body awareness and mindfulness during their practice (Barooah, 2023).

2. **Use of props:** Iyengar yoga utilizes a wide range of props to assist practitioners in achieving proper alignment and adapting poses to individual needs and abilities. Props are such as blocks, straps, blankets, and wooden benches to support and modify poses. They can help individuals with limited flexibility or mobility practice yoga safely (Rod, 2024).
3. **Systematic and disciplined approach:** Iyengar yoga follows a systematic and disciplined approach to practice. Sequences of poses are carefully planned and timed,

allowing practitioners to progress gradually and build strength, flexibility, and stability (Baghel, 2021).

4. **Therapeutic Applications:** Iyengar yoga is recognized for its therapeutic benefits. The therapeutic effects of Iyengar yoga have been supported by various research studies and clinical trials (Bower et al., 2012; Innes et al., 2016; Michalsen et al., 2012; Williams et al., 2005; Williams et al., 2009). It has been used as an intervention for various health conditions, including chronic low back pain, depression, rheumatic diseases, common cold, motherhood, menopause, cancer, neck-shoulder and knee ailments and scoliosis (Baghel, 2021; Casagrande et al., 2022; Iyengar et. al, 2010; Keller, 2022; Williams et al., 2005).

5. **Attention to detail and precision:** Iyengar yoga instructors pay close attention to the details of each pose, providing precise instructions and adjustments to ensure proper alignment and body engagement (Csala et al., 2020).

Iyengar yoga was selected for this study due to its strong emphasis on physical alignment, the use of supportive props, and a systematic structure, which makes it especially suitable for beginners and individuals with varying physical needs. Additionally, its proven therapeutic benefits and focus on precision have been supported by numerous studies, making it a widely used method in health-related yoga research. These qualities make it especially effective for addressing health issues and supporting specific goals (Cramer et al., 2013; Williams et al., 2005) and these make Iyengar yoga widely used in clinical research due to its structured and accessible format, making it suitable for both beginners and individuals with physical or therapeutic needs (Bower et al., 2012; Streeter et al., 2017).

2.1.5. Benefits of Yoga

Yoga has been found to have numerous benefits for both physical and mental health. Research studies have shown that yoga can be as effective as exercise in improving various health-related outcomes (Ross & Thomas, 2010). It has been associated with improvements in mental health, including reducing anxiety, depression, and stress

(Cramer et al., 2013). Regular yoga practice has been shown to have therapeutic effects on various ailments and conditions (Woodyard, 2011). Figure 2.2 reveals the impact of yoga on physical, mental, and therapeutic effects.

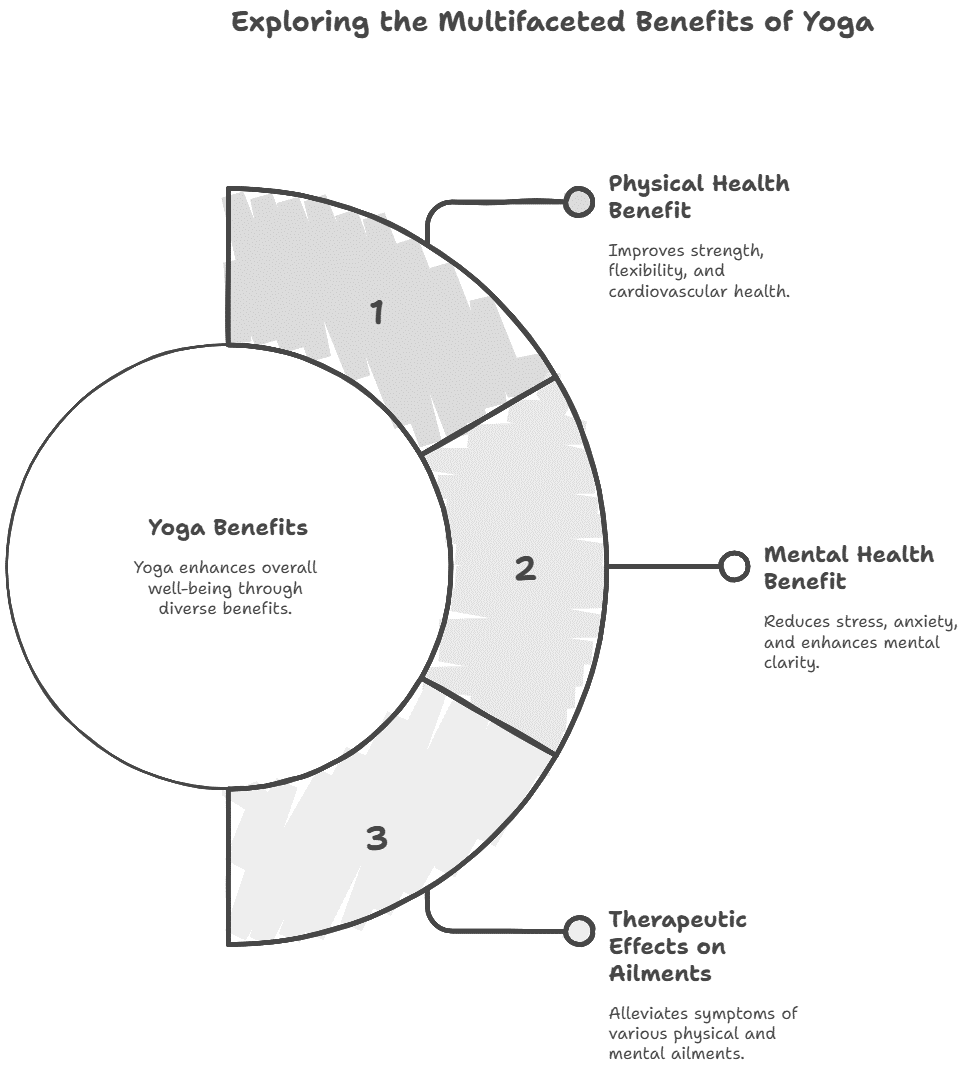


Figure 2.2. Exploring the Multifaceted Benefits of Yoga

2.1.5.1. Effects on Physical Fitness

Physical fitness is generally understood as a set of attributes related to an individual's physical abilities and performance. It refers to the overall health and well-being of an individual concerning their physical abilities and performance. Physical fitness is defined as the ability to perform daily activities with enthusiasm and alertness,

without being too tired, and with sufficient energy to enjoy leisure activities and tackle unforeseen events (Caspersen et al., 1985).

Two categories of components are most typically cited: related to health and related to skills (Caspersen et al., 1985). Health-related physical fitness refers to the specific components of physical fitness that are closely linked to overall health. It is a subset of physical fitness that focuses on attributes and abilities that contribute to overall health and well-being. These components may include cardiorespiratory endurance, muscular strength and endurance, flexibility, and body composition (Mihailova et al., 2014). Skills-related physical fitness refers to the components of physical fitness that are related to the development and improvement of specific motor skills and abilities. These components include agility, balance, coordination, power, reaction time, and speed (Healy et al.,2018).

Research has shown that Hatha yoga can enhance various aspects of health, including muscular strength, flexibility, cardiorespiratory fitness, body composition, and overall well-being. It may also help individuals with chronic conditions such as arthritis and assist in weight management by improving metabolic health and physical performance. These findings are supported by several studies and reviews conducted across different populations and contexts (Batrakoulis, 2022; Hagins et al., 2007; Moonaz et al., 2015; Tran et al., 2001). Observations have been made in children, older adults, individuals with Parkinson's disease, and athletes (Bartos et al., 2022; Bhunia et al., 2024; Colgrove et al., 2012; Kartal & Ergin, 2020; Roland et al., 2011; Sivaramakrishnan et al., 2019; Shin, 2021; Telles et al., 2013).

In addition to scientific research, the experiences and perceptions of yoga practitioners also provide valuable insights. In this context, a large-scale global survey was conducted in 2021 by the platform *doyou.com*, gathering responses from over 10,000 yoga practitioners across 124 countries. Participants identified flexibility, strength, and balance as the most significant physical benefits of yoga. Additionally, some reported practicing yoga for chronic pain management and weight control, while a smaller group cited other physical reasons.

Among the various important areas explored in the literature, in the present research, physical fitness variables were selected as the primary outcome measures. Specifically, the study emphasizes key components, including strength, balance, flexibility, and body composition.

2.1.5.2. Effects on Perceived Health

Perceived health refers to an individual's subjective evaluation of their overall well-being. It is a comprehensive but straightforward indicator that reflects both physical and mental health, general wellness, attitudes toward illness, and certain health behaviors (Liao, 2023).

Perceived health is commonly assessed using self-rated health questionnaires or single-item scales that ask individuals to evaluate their overall health status (Atchison & Gift, 1997). Because health is a subjective and socially influenced concept, respondents often consider their health within the context of their socioeconomic status and broader social environment (Atchison & Gift, 1997; Erengin et al., 1997; Lankila et al., 2022). In the literature, terms such as "self-perceived health," "perceived health," and "self-perception of health" are frequently used interchangeably.

Research indicates that perceived health is closely tied to overall well-being and life satisfaction. For example, physically active individuals often report feeling healthier, which can in turn improve their emotional well-being (Liao, 2023). Perceived health is influenced by various factors, including social support, personal beliefs, and income level. It also affects how people take part in daily life, including family, social, and work roles (Piatt et al., 2016; Young-Speirs et al., 2021). Regular exercise, such as attending a fitness club, has been linked to higher self-rated health (Heiestad et al., 2020), whereas economic hardship can lower perceived health (Saez et al., 2019). In yoga, feeling healthy is important because it can increase motivation and help people stay committed to the practice (Cartwright et al., 2020). For example, a study in Turkey found that individuals who practiced yoga for an extended period reported better physical health (Erkin et al., 2018). Another study with breast cancer survivors found that yoga improved their physical, mental, and social well-being (Puymbroeck et al.,

2013). In a randomized controlled trial, Bower et al. (2012) studied the effects of Iyengar yoga on breast cancer survivors with fatigue. Although perceived health was not directly measured, the 12-week yoga program reduced inflammation-related gene activity, which may suggest better overall health.

The existing literature indicates that perceived health is a crucial factor in understanding health outcomes, behavior change, and the success of interventions. It has been studied in different contexts such as neighborhood environment (Yen et al., 2009), physical activity (Liao et al., 2023), health coaching (Ryd et al., 2022), yoga adherence (Erkin et al., 2018), and cancer recovery (Bower et al., 2012; Puymbroeck et al., 2013). However, more research is needed to explore its role across diverse populations and settings.

2.1.5.3. Effects on Perceived Stress

Perceived stress is a crucial concept in psychological studies, as it reveals how people cope with and perceive stress in their lives (Varughese & Rema, 2021). Stress is the body's and mind's response to outside demands (Damaske et al., 2016; Reis et al., 2010). Perceived stress, on the other hand, refers to a person's assessment of those demands and their ability to handle them. Personal attributes, life events, and daily problems can all impact it (Cohen et al., 2012). Researchers can gain a deeper understanding of how people cope with and perceive stress by examining their thoughts about it.

Studies demonstrate that yoga can help people of all ages and backgrounds feel less stressed. Cramer et al. (2013) did a meta-analysis and showed that yoga can benefit people with depression. Yoga has also been shown to benefit specific populations, including women who work from home (Sadawarte & Sahasrabuddhe, 2022), nursing students, and medical students (Giri et al., 2021; Kalavalli et al., 2022). Zou et al. (2018) stated that yoga and Tai Chi are mind-body therapies that help alleviate stress by restoring neurological balance. Yoga was more effective than education in reducing stress among low-income individuals with persistent back pain (Berlowitz et al.,

2020). A systematic review also indicated that yoga, breathwork, and mindfulness consistently made people feel less stressed (Stillwell et al., 2017).

Many researchers have investigated the impact of Iyengar yoga on the stress levels of individuals. Bower et al. (2012) reported that breast cancer survivors who practiced Iyengar yoga felt less tired, depressed, and stressed. Fischer et al. (2022) also found that women experiencing stress who engaged in Iyengar yoga for 12 weeks reported feeling better about their stress, anxiety, depression, and quality of life. In 2012, Michalsen et al. demonstrated that Iyengar yoga improved the self-esteem of women facing anxiety and reduced their stress levels. In general, perceiving stress through scales is useful in psychology research for understanding how people feel and rate their stress. Because of this, present study used this scale to determine how stressed individuals believed they were.

2.1.5.4. Effects on Self-Efficacy

Albert Bandura's Social Cognitive Theory (SCT) is one of the most widely used psychological theories, applicable in various fields, including education, healthcare, rehabilitation, law, business, and sports and exercise (Bandura, 1986; Bandura, 2001). Social Cognitive Theory explains how individuals learn and acquire new behaviors by illustrating the interaction among personal, behavioral, and environmental factors. As shown in Figure 2.3, Social Cognitive Theory emphasizes the dynamic and reciprocal interaction between these factors (Bandura, 2004). It highlights the significance of cognitive processes in understanding how individuals learn and develop behaviors.

According to Bandura (2005), self-efficacy affects behavior both directly and indirectly, influencing factors such as outcome expectations, goal setting, and awareness of potential challenges. These factors help shape a person’s motivation, decisions, and ability to maintain a behavior. In Social Cognitive Theory, self-efficacy is considered crucial for achieving positive behavioral changes (Bandura, 1977). It plays a big role in building healthy habits and improving performance (Michie et al., 2011; Vakola, 2016). In healthcare, individuals with higher self-efficacy tend to be

more effective in managing their own care and addressing long-term health issues (Almutary & Tayyib, 2021; Ertaş et al., 2022; McAuley et al., 2010).

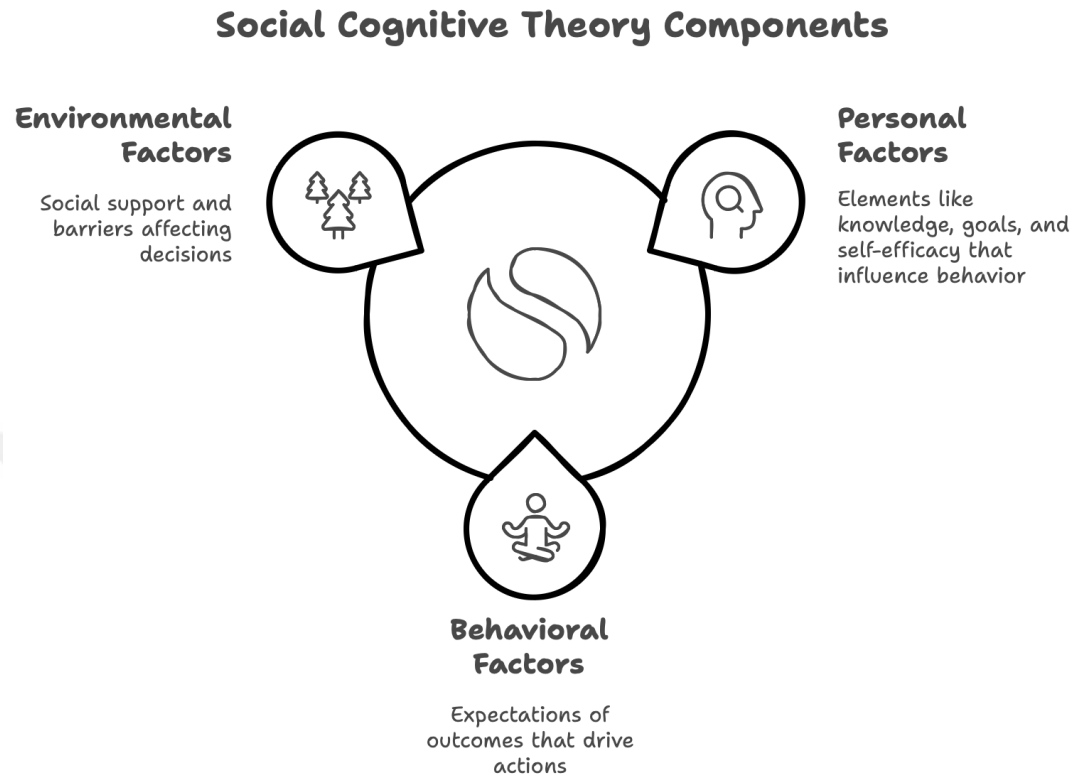


Figure 2.3. Components of Social Cognitive Theory (Bandura, 2005)

Self-efficacy is key in yoga. Several studies have demonstrated that yoga can enhance self-efficacy across various populations and settings. The Yoga Self-Efficacy Scale (YSES) was developed by Birdee et al. (2015) attached as Appendix I as a standardized measure to evaluate individuals' beliefs in their ability to practice yoga. Research has found that yoga can increase self-efficacy in different areas, including pregnancy and childbirth (Campbell & Nolan, 2019; Koyuncu & Bülbül, 2021; Sun et al., 2010), mental health and trauma healing (Martin et al., 2015), and adolescent development (Das et al., 2016; Kwasky & Serowoky, 2018). Positive effects on self-efficacy have also been reported in specific groups such as breast cancer survivors (Puymbroeck et al., 2013) and patients with chronic pain (Marshall et al., 2022), with improvements reported in coping ability and general quality of life. In the context of education, yoga-based interventions have also been reported to increase self-efficacy among school teachers and students (Justice et al., 2016; Mookkiah & Kumar, 2021).

The presence of these correlations highlights the importance of self-efficacy as a valuable end and process by which yoga impacts behavioral and psychological health. Assessment of this construct, Birdee et al.'s (2015) Yoga Self-Efficacy Scale, was utilized in the present study. These differences in outcomes related to self-efficacy across the two formats of yoga courses were examined.

2.2. Yoga Teaching Methods

Yoga teaching has evolved, and the methods used to teach it have undergone significant changes. Traditionally, yoga has been primarily taught in an in-person format, and for many years, this approach has remained consistent. New models for delivering education and training, including online courses and hybrid courses (a combination of in-person and online instruction), have become more readily available due to technological advancements and global events such as the COVID-19 pandemic. Today, there are three primary models of instruction for teaching yoga courses: in-person, online, and hybrid. Each instructional model has its own set of pros/cons depending on the context, needs of the students, and objectives of the education. This section will describe these different methodologies in detail, including definitions, advantages, and disadvantages for yoga practice and research.

2.2.1. In-Person Approach to Practising Yoga

In-person teaching is a traditional method of education that involves face-to-face interaction between teachers and students. It allows for real-time communication, immediate feedback, and direct engagement in a shared physical space (Mowles et al., 2020; Petchamé et al., 2021). Several terms are used interchangeably with in-person teaching, including face-to-face teaching, traditional classroom instruction, on-site instruction, conventional teaching, and in-person education. All of these emphasize the physical presence of both teachers and learners, distinguishing this format from online or remote methods (Petchamé et al., 2021). For this research, the term "in-person" was chosen due to its common usage in comparison to remote or online education and its prevalence in the research literature.

Examining the literary sources, it is evident that the educational methodology adopted for yoga studies is in-person. Apart from the *guru-sishya* approach, which has its roots in the history of yoga mentioned above, there are certain benefits to be had from in-person yoga instruction. In-person teaching enables interaction among students and instructors, supporting real-time communication, immediate feedback, and engagement (Bernard et al., 2009; Muste, 2022). In yoga specifically, the experience can be more immersive, with individualized feedback on alignment, physical assistance, and safe practice (Brinsley et al., 2021). Furthermore, in-person courses enable social interaction, continuous motivation of participants, as well as a sense of community – all of which have been found to enhance higher adherence and well-being (Bhargav, 2018). Lastly, in-person programs provide researchers with the opportunity for direct observation and the possibility of physical and psychological measurements (Adams et al., 2019).

Although in-person yoga is beneficial, it also has limitations that have been discussed in the literature. The requirement of in-person attendance can limit access for clients in remote settings or those with disabilities who are unable to attend the class location physically. Furthermore, in-person classes have inflexible scheduling. Space in the physical classroom or environment may also impact in-person courses. Hygiene, distractions, space, and the number of participants involved in courses are also concerns (Brinsley et al., 2021; Brisson et al., 2015). In-person programs also create financial challenges to participant access in terms of the costs of a course or transit to and from the studio (Avery et al., 2021). The challenges described may impact the scalability and access to in-person programs.

2.2.2. Online Approach to Practising Yoga

Online education is a form of instruction delivered remotely using digital tools and platforms, such as telelearning, video conferencing, and learning management systems. There are various terms, such as tele-teaching, distance learning, and virtual education, which are sometimes used interchangeably; however, there are slight distinctions (Tomlinson et al., 2013; Zheng et al., 2022). Telelearning typically refers

to the use of audio or video conferencing tools. In contrast, online learning encompasses a broader range of activities, including accessing course information and materials, attending virtual classes, and submitting assignments on digital platforms (Fábián et al., 2022). In yoga research, the term 'online' is used most often in reference to internet-based delivery. In this study, the term online was chosen for consistency and clarity.

The evolution of online education began in the 1980s, developed with the increasing popularity of internet technology in the 2000s, and experienced significant growth and momentum during the COVID-19 pandemic (Zou et al., 2025; Cutri & Mena, 2020; Veletsianos & Seaman, 2020). The pandemic also altered the delivery of yoga education, increasing access to virtual yoga courses, communities, and connections worldwide (Sharma et al., 2022; Nagarathna et al., 2021). Research indicates that online yoga offers numerous benefits and advantages, including flexibility, as it allows participants to attend classes from home without considering travel time, parking, or childcare (Nagarathna et al., 2021; Brinsley et al., 2021). Additionally, the decreased cost of participating in online learning can save money for both the school and students, as well as eliminate the barrier of performing yoga in a dormitory, at home, or wherever required (Zheng et al., 2022). There can be a significantly greater level of privacy and autonomy in doing so, and it assists participants in developing a home practice (Brinsley et al., 2021). There are numerous online systems that offer participants a range of resources, including videos, meditation, and a support community (Kumaratungga et al., 2022; Nagarathna et al., 2021). There are many types of instructional resources and modalities for instructors and learners to utilize; thus, they virtually enhance the learner/student experience and significantly improve education. Having reusable materials, such as recorded classes, means learners can revisit difficult-to-understand concepts they have previously learned and continue to improve their skills and practice (Zheng et al., 2022). In Sharma et al.'s (2022) study, yoga instructors in India reported that the primary benefits of teaching online during the COVID-19 lockdown were avoiding the risk of infection, saving money, and reaching a wider audience of trainees across the country.

Although online yoga can be beneficial, it has some disadvantages. A key issue is often the lack of instructor feedback through physical guidance. In in-person courses, the instructor would provide hands-on feedback, adjustments, and corrections to ensure safety, alignment, and, regardless of the instructor, help participants learn accurate alignment. With the absence of instructor feedback and correction, online yoga may also lack social interaction and emotional connections, which are essential for maintaining motivation and a sense of community (Zheng et al., 2022). Also, barriers such as network connectivity and instructor instructions that participants struggle to follow can contribute to the drawbacks of online learning (Wadhen & Cartwright, 2021). Furthermore, learners desire the discipline of in-person learning, while instructors struggle to monitor their students' engagement and the extent to which they are developing (Zheng et al., 2022).

Sharma et al. (2022) surveyed yoga instructors and found that 74.03% experienced technical problems teaching online, and 63.90% regretted not being able to see their students in person. Many instructors were also concerned that without hands-on instruction, there was a risk of injury (59.16%). These practical issues aside, some traditionalists felt critical about teaching online. According to Simões (2022) and Danhauer et al. (2017), the online format may compromise the fundamental elements of yoga, particularly the teacher-student relationship, which they believe is crucial for promoting a deeper understanding of the practice. According to Jamatia (2022), conveying the meditative and spiritual aspects of yoga can also be more challenging in virtual environments, which may limit the comprehensive experience of yoga.

2.2.3. Hybrid Approach to Practising Yoga

Hybrid learning, also known as blended learning, combines in-person and online instruction to provide a flexible and personalized learning experience (Picciano, 2019; Ulla & Perales, 2022). It supports various learning styles, enhances access, and promotes active participation and self-paced study (Ahmed, 2010; Ponniah et al., 2023).
However, it also has disadvantages. Hybrid models can lead to unequal student engagement, especially between in-person and remote learners (Nebrida & Bangud, 2022). Challenges include teachers' limited tech skills, students' lack of focus, internet

issues (Dwi et al., 2023), and reduced motivation or discomfort with the mixed format (Osaili, 2023). Additionally, it can be time-consuming and emotionally stressful for teachers due to the need to manage both formats (Aji & Ardin, 2020).

Although present in other academic fields, there is a notable lack of studies on hybrid learning and education in the context of yoga practices. Therefore, hybrid model training was not included in this study.

CHAPTER 3

METHODOLOGY

This chapter offers a comprehensive overview of the research methodology used in the study. The primary aim of this study was to compare the effects of in-person and online hatha-based Iyengar yoga programs on various variables: physical fitness components (strength, balance, flexibility, body composition), perceived health status, perceived stress levels, yoga self-efficacy, and adherence to yoga practice among healthy young adult women aged 18 to 30. Another aim is to explore participants' perceptions and personal experiences regarding the effects of in-person and online yoga practices. Accordingly, the chapter is organized into five sections: research design, study participants, data collection procedures, statistical analysis methods, and the strengths and limitations of the study.

3.1. Research Design

A quasi-experimental pretest–posttest design with a control group structure was adopted in this study. This design method is widely accepted for evaluating interventions in naturalistic or real-world settings where random assignment is not feasible (Campbell & Stanley, 1963; White & Sabarwal, 2014). Due to participants' logistical conditions, such as residential status and access to a suitable practice environment, randomization could not be implemented. Instead, the group assignment was based on practical factors like residential proximity and access to an appropriate yoga practice environment. Although quasi-experimental design does not offer the full experimental control of randomized controlled trials (RCTs), this study allowed for testing causal hypotheses by comparing outcomes before and after the intervention between the intervention (in-person and online) and control groups.

The intervention was implemented over 8 weeks, during which both intervention groups followed the same yoga program in terms of content, sequencing, and instructional delivery, with the only difference being the mode of delivery (in-person vs. online). The control group, on the other hand, did not receive any yoga training during this period but completed the same pre- and post-test measurements as the intervention groups.

In addition to the quantitative component, the study employed a mixed methods approach to obtain a more comprehensive and integrative understanding of the research problem by combining multiple sources of data (Fraenkel et al., 2012; Kopač et al., 2020). Specifically, a convergent parallel design was used, adapted from Creswell and Plano Clark (2011), in which quantitative and qualitative data were collected and analyzed independently but concurrently. This design allowed for both forms of data to be interpreted side by side, enabling the integration of results and enhancing the validity and depth of the conclusions (Hesse-Biber, 2012; Morse, 1991; Younas et al., 2023). The process followed in this convergent design is illustrated in Figure 3.1.

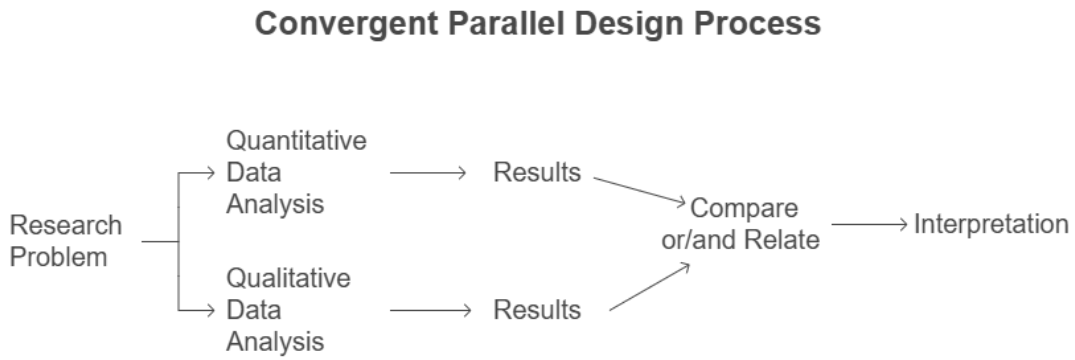


Figure 3.1. Key Features of the Convergent Parallel Design
(Creswell & Clark, 2011)

3.2. Data Collection Procedures

The study was conducted following the principles outlined in the Declaration of Helsinki. Before data collection, detailed information regarding participants' data, variables, data collection procedures, and study objectives was submitted for ethical

review. Ethical approval was granted by the Middle East Technical University (METU) Human Research Ethics Committee under three separate protocols (0204-ODTUIAEK-2023; 331-ODTUIAEK-2023; 0072-ODTUIAEK-2024), as documented in Appendix A. Following ethical approval and before the start of the study, informed consent forms (Appendix K) were signed and collected from all participants in the three groups. After the approval of the ethical protocol, pre-tests were conducted in October 2023. The intervention study commenced afterward. Quantitative analysis was completed by December 2023, and qualitative analysis was done by January 2024.

Figure 3.2 outlines the data collection procedures in the present study. The study's collection, analysis, and integration of both qualitative and quantitative data are seen from the table, which offers a thorough grasp of the research question.

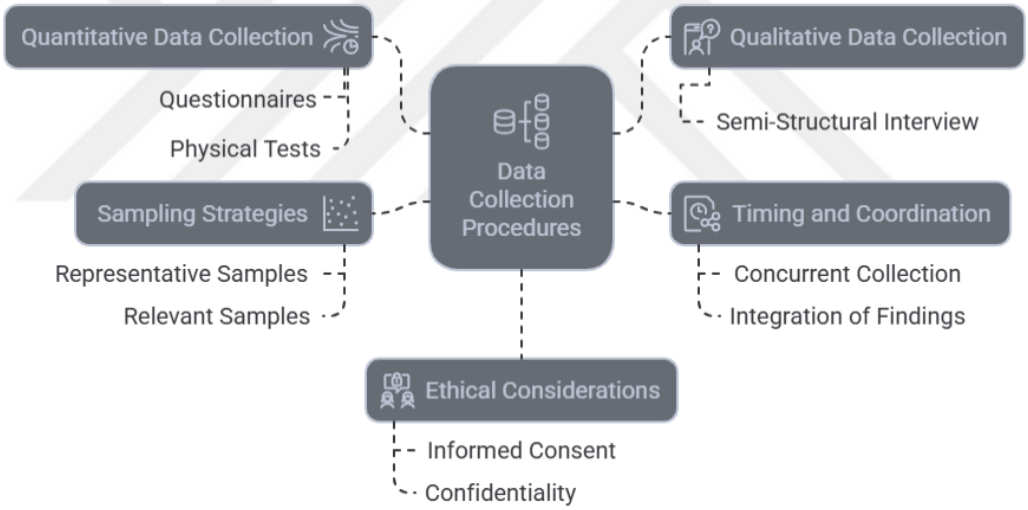


Figure 3.2. Data Collection Procedures in the Study

The figure provides a comprehensive overview of the research method, illustrating how qualitative and quantitative data were analyzed, merged, and collected during the study. The quantitative data for the research included the dependent variables are the components of physical fitness (strength, balance, flexibility, and body composition), perceived health, perceived stress, yoga self-efficacy, and adherence to yoga practice. The qualitative data included the experiences, motivations, and perspectives of the participants involved in the yoga intervention, which were collected from semi-

structured interviews. The qualitative and quantitative data were then analyzed and compared to gain a clear perspective on the data obtained from this study.

Table 3.1 presents the measurement tools used in the study, outlining the variables assessed, the timing of data collection (pre- and post-intervention or at the 1-year follow-up), and the application of each tool across the in-person yoga, online yoga, and control groups.

Table 3.1. Overview of Data Collection Instruments and Testing Timeline by Group

Test / Instrument	***Type***	***Pre-Test***	***Post-Test***	***One-Year Follow Up***	***In-Person***	***Online***	***Control***
PAR-Q+	Physical Readiness	✓	–	-	✓	✓	✓
Physical Fitness Tests	Strength, Balance, Flexibilty Body Composition	✓	✓	-	✓	✓	✓
PSQ (Perceived Stress)	Psychological Measure	✓	✓	-	✓	✓	✓
PHQ (Perceived Health)	Psychological Measure	✓	✓	-	✓	✓	✓
YSQ (Yoga Self-Efficacy)	Self-Efficacy	✓	✓		✓	✓	✓
Semi-Structured Interviews	Qualitative Research	-	✓	-	✓	✓	-
Adherence to Yoga Questionnaire (AYQ)	Adharence	-	-	✓	✓	✓	-

Note: ✓means "Test taken or applied"; PAR-Q+: Physical Activity Readiness Questionnaire

Most instruments were administered at both the beginning and end of the 8-week intervention. The only follow-up measure was the Adherence to Yoga Questionnaire,

which was distributed exclusively to participants in the intervention groups (in-person and online) and not administered to the control group.

3.3. Participants

This study focused on young adult women in Ankara, aged 18 to 30. Research has shown that this population is suitable for assessing physical and psychological outcomes, confirming its suitability for research examining the benefits of yoga (Erkin & Akçay, 2018; Halder et al., 2015).

The convenience sampling method was employed to recruite participants for quantitative data analysis; purposive sampling method was utilized for qualitative analysis. Participants were recruited from university campuses, workplaces, and public areas in Ankara through posters and social media. Posters were shared in common areas at Middle East Technical University (METU), like dorms, departments, cafes, the library, and the marketplace. As a social media platform, Instagram and Facebook were used to connect with people.

Participants included in the study were required to be;

- Young adult woman (aged between 18 and 30),
- Unfamiliarity with yoga and not practicing yoga,
- Sedentary lifestyle.

And excluded if they had;

- Familiarity with yoga and practicing yoga,
- Currently engaging in regular sports activities,
- Major orthopedic or neurological disorders,
- Active musculoskeletal pain holders prevent the yoga intervention from being completed.

Based on the inclusion and exclusion criteria, 142 individuals applied to participate in the study. Following the exclusion of 22 applicants, 110 were decided eligible. Of these, 63 consented, and 60 completed the pre-test. A total of 60 participants began the intervention. A total of three participants withdrew from the study due to personal or

health-related reasons. One participant from the online group discontinued participation in the sixth week due to relocating to another country. Another participant from the in-person group withdrew at the end of the first week following a cancer diagnosis. One individual assigned to the in-person group did not attend any sessions from the beginning of the intervention, without providing a reason.

The intervention (in-person and online) and control groups procedures were conducted independently but in parallel. At this stage, all groups were considered finalized, and a total of 41 individuals were determined to be eligible for participation. However, allocating this relatively small sample size equally across three groups would have further diminished the statistical power of the study. Furthermore, assigning individuals who were highly motivated to practice yoga to a control group was deemed inappropriate, as doing so could have negatively impacted their motivation and engagement. As a result, the control group was formed from individuals who had not applied to participate in the intervention, but who met the same inclusion and exclusion criteria with those in the intervention groups.

Convenience sampling was employed during the group assignment. In preliminary interviews with 41 applicants for the intervention group, 18 individuals reported living in dormitories with shared rooms and lacking a private, quiet space suitable for yoga practice. As a result, these participants were directly assigned to the in-person group. Among the remaining applicants, 16 stated that they lived far from the yoga studio and had work commitments, making it difficult for them to regularly attend in-person sessions; therefore, they were assigned to the online group. Of the remaining 7 participants, a random selection was conducted via Zoom, allocating three to the in-person group and four to the online group. Thus, convenience sampling was utilized during the group assignment.

The control group, unlike the intervention group, did not participate in yoga practice during the study. After confirming the eligibility of control group participants via email, their adherence to the inclusion criteria was further verified through a follow-up phone call. Similar to the intervention group, information about the test procedures was sent to the control group via email. To ensure that the procedures were carried out

consistently for all three groups, the process was monitored under the supervision of an external expert. All participants underwent the pre-test and post-test assessments in a mixed order. During the pre-tests, participants were instructed not to engage in any physical activity or change their dietary habits for the duration of the study period.

Finally, as shown in Figure 3.3, 57 participants completed the intervention across in-person, online, and control groups.

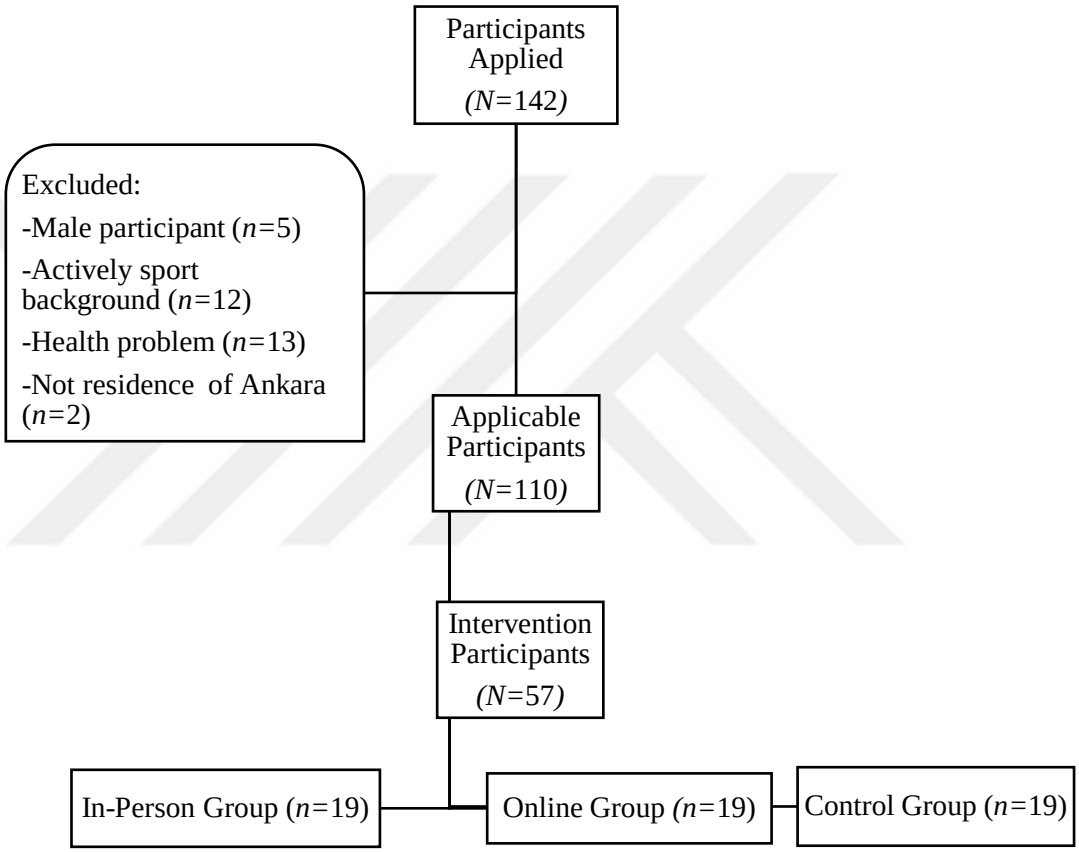


Figure 3.3. Participant Enrollment and Intervention Completion Flowchart

An overview of the demographic profiles of all participants is provided in Table 3.2.

Table 3.2. Demographics of Participants (N=57)

Variable	*Total*		*In-Person*		*Online*		*Control*	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Age (18-30)	57	100	19	%100	19	%100	19	%100
18-25	44	77.19	18	94.75	5	26.32	13	68.42
26-30	13	22.81	1	5.25	14	73.68	6	31.58
Marital Status								
Single	28	49.1	12	63.16	8	42.11	8	42.11
In a Relationship	23	40.4	7	36.84	6	31.58	10	52,63
Married	4	7	-	-	3	15.79	1	5.26
Decline to specify	2	3.5	-	-	2	10.53	-	-
Education Level								
Undergraduate Student	40	70.2	18	97.74	8	42.11	14	73,68
Bachelor's Degree	7	12.3	-	-	6	31.58	1	5.26
Master's Student	3	5.3	-	-	1	5.26	2	10.53
PhD's Student	7	12.3	1	5.26	4	21.05	2	10.53
Field of Study (Graduated/Currently Enrolled)								
Education	15	26.32	-	-	7	46.67	8	53.33
Engineering	17	29.83	7	41.18	5	29.41	5	29.41
Architecture/City Planning/Landscape Architecture	8	14.04	5	-	1	-	2	-
Medical Science	2	3.51	-	-	2	100	-	-
Social Science	14	24.56	6	42.86	4	28.57	4	28.57
Economics/Administrative Science	1	1.76	1	100	-		-	-

The demographic profiles of the 57 participants are presented in Table 3.2 across the in-person, online, and control groups. The in-person group was the youngest and most homogeneous, consisting mostly of single undergraduate students aged 18–25, primarily from engineering and architecture fields. The online group was the oldest and most diverse in terms of age, marital status, and education level, with participants from education, engineering, and medical sciences. The control group was more balanced in age and marital status, and included a mix of undergraduate and graduate students, predominantly from education and social sciences.

The employment and perceived socio-economic status, living conditions of the study participants are shown in Table 3.3.

Table 3.3. Socio-Economic Conditions of Participants (N=57)

Variable	*Total*		*In-Person*		*Online*		*Control*	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Employment Status								
Student (Unemployed)	39	68.4	16	41.03	8	20.51	15	38.46
Employed Full Time	9	15.8	-	-	8	88.89	1	11.11
Student (Employed)	7	12.3	3	42.86	2	28.57	2	28.57
Employed Part Time	1	1.8	-	-	1	100	-	-
Unemployed	1	1.8	-	-	-	-	1	100
Industry employed in								
Education	8.	44.44	1	12.5	4	50.00	3	37.5
IT (Information Technology), Software, Defence Industry	3	16.67	-	-	3	100	-	-
Engineering	2	11.11	-	-	2	100	-	-
Health	2	11.11	-	-	2	100	-	-
Public Service	1	5.56	1	100	-	-	-	-
Designer/Landscaping	2	11.11	-	-	1	100	-	-
Perceived Economic Status								
Lower Income	5	8.77	2	40	2	40	1	20
Lower -Middle Income	19	33.3	9	47.37	3	15.79	7	36.84
Middle Income	25	43.86	6	24	10	40	9	36
Upper-Middle Income	8	14.04	2	25	4	50	2	25
Accommodation Types								
Dormitory	23	40.4	17	73.91	-	-	6	26.09
Live with parents	22	38.6	1	4.55	12	54.55	9	40.91
Alone at own home	7	12.3	-	-	4	57.14	3	42.86
Shared home with friends	5	8.8	1	4.55	3	60	1	20

The socio-economic characteristics of the participants among the total and three groups were shown in Table 3.3. Participants in the in-person group were predominantly unemployed university students (41.03%), most of whom lived in dormitories (73.91%) and identified as lower- to lower-middle-income. The online group consisted mainly of full-time professionals (88.89%) working in fields such as IT, education, engineering, and health. They mostly lived with their parents (54.55%) or alone (57.14%) and reported middle to upper-middle income levels.

The control group had a more mixed composition in terms of employment, income, and accommodation, with the majority being students or middle-income individuals living with parents or in dormitories.

3.4. Yoga Intervention Program

The intervention was implemented among two distinct groups: an in-person and an online group. Participants (*n*=38) took part in an 8-week hatha-based Iyengar yoga program, attending two sessions per week for a total of 16 courses. Each course lasted one hour. The overview of the intervention in the two groups is shown in Table 3.4.

Table 3.4. Overview of the Yoga Intervention Program Structured by Group

Structure of Program	***In-Person***	***Online***
Sample Size (*n*)	19	19
Program Duration	8 weeks	8 weeks
Session Frequency & Duration	2 times per week / 1 hour	2 times per week / 1 hour

According to Table 3.4, the intervention was implemented over 8 weeks, with two sessions per week, each lasting one hour. This structure is supported by research indicating that most yoga studies employ an 8-week duration, which is effective in improving physical and mental health outcomes (Elwy et al., 2014; Sherman, 2012).

A twice-weekly schedule was chosen to balance effectiveness with adherence, as it is more manageable for participants (McCall et al., 2013). Integrated yoga methods, including yoga poses (asana), pranayama, and guided relaxation, showed the most significant benefit in anxious participants (Elwy et al., 2014). Therefore, in this study, a 1-hour course begins with 45 minutes of yoga poses (asana) practice, followed by 10 minutes of pranayama (breathing exercises) and 5 minutes of meditation.

The structure and content of the yoga program were developed based on established literature in both classical yogic texts and modern evidence-based sources. Classical sources such as the Hatha Yoga Pradipika mention 15 primary yoga poses (Svatmarama, 2017). In contrast, modern yoga literature, such as B.K.S. Iyengar's "Light on Yoga" (2006), provides detailed descriptions of over 200 yoga poses, along with their therapeutic applications, serving as a comprehensive reference.
Two books were used as guidance for structuring the whole program., Geeta Iyengar's Yoga: Beginner Level (2000) was used as the primary source in this study, as it offers

a well-structured approach designed explicitly for beginner-level practice. "*Advisory on Tele Yoga Services"* published by the Ministry of Health in the Government of India (2020) was also taken into consideration during the development of the program. Another important work is that of Iyengar and Iyengar (2003) on the basic principles for teacher education. This book was also used for the dos and don'ts of teaching during the lessons.

Based on the sources and texts mentioned above, the yoga program was designed with several key considerations:

- The intervention utilized between 10 and 30 yoga poses for practical implementation,
- Structure included a warm-up series, a sequence of strength, stretching, and balance-focused yoga poses, and a cool-down phase. Yoga poses are carefully considered and put in the series,
- The sequence of yoga poses consisted of standing poses, forward bends, backbends, twists, inversions, and breath technique.
- Poses built from basic to more complex poses,
- Advanced poses such as handstands, headstands, deep backbends, and extreme body stretches were excluded for safety.
- Similarly, advanced breath techniques (pranayama) were not included in the program.

After the researcher developed the program, expert opinions were obtained through consultations with two yoga instructors. The program was shared via email with two experienced Turkish Iyengar yoga teachers: one holding a Level 2 certification based in New York, and the other holding a Level 3 certification based in Türkiye. Both teachers have extensive experience (more than 20 years) in conducting yoga sessions in both in-person and online formats. One teacher reviewed the program via email and approved the overall structure without suggesting changes. A one-hour Zoom meeting was arranged with the other teacher, during which the weekly program was reviewed in detail. The teacher reviewed the programme and improved it regarding safety, accessibility, and instructional clarity issues for young adult beginners. The following modifications were made to the programme by the expert:

- The program's overall sequence was reorganized.
- Some yoga poses were added based on the specific needs of the participants, considering their student lifestyle, such as postures that open the chest and lengthen the spine to alleviate the effects of prolonged sitting.
- Some beginning yoga poses were replaced with more beginner-friendly variations.
- Every week, new yoga poses are introduced.
- Props were encouraged to be used in the program, and yoga poses were adjusted to incorporate their use.
- The weekly flow was revised to allow a more gradual progression in difficulty.
- Due to some limitations of the online technique, simpler versions of the yoga poses were included to suit the home environment.
- Based on the participants' level, basic breathing techniques were chosen.

Based on the expert opinions, the latest version of the program was developed, as seen in Table 3.5, and an extensive sample of the program is provided in Appendix L. In the program, it was seen that the names of the yoga poses are provided in Sanskrit. It is worth noting that not all English (or Turkish) translations of Sanskrit names for yoga poses have standardized or equivalent translations. Although some are widely accepted in English translations (e.g., Adho Mukha Svanasana being "Downward-Facing Dog" as *"Aşağı Bakan Köpek"* in Turkish), others are not standard, or their translations differ in the shape of poses in the yoga books. Therefore, the original Sanskrit names were used in this study following traditional practice. However, during the intervention, Turkish translations were used, and postures with unknown translations were explained verbally to participants.

Table 3.5. Example of the First Two Weeks of the Eight-Week Yoga Program

Structure	***1st week***	***2nd week***
Introduction	Start course in Swastikasana (3* Om Chants)	Start course in Swastikasana (3* Om Chants)

Table 3.5. (continued)

Warm-Up Series	Adho Mukha Virasana to Adho Mukha Svasana Uttanasana in baddanguliyasana Samasthiti Tadasana Urdhva Hastasana to Utkatasana Uurdhva Baddanguliyasana Namaskarasana to Urdhva Namaskarasana Namaskarasana to Urhdva Hastasana	Adho Mukha Virasana to Adho Mukha Svasana Uttanasana in baddanguliyasana Samasthiti Tadasana Urdhva Hastasana to Utkatasana Uurdhva Baddanguliyasana Namaskarasana to Urdhva Namaskarasana Urdhva Namaskarasana to Urdhva Hastasana
Strength-Stretching-Balance Series	Gomukasana Uthita Hasta Padasana Parshva Hasta Padasana Utthita Trikonasana Virabhadrasana II Parshva Konasana (hands on the waist) Vrksasana Urdhva Prasaritta Padasana	Gomukasana Variations (Belt Usage and walk) Uthita Hasta Padasana Parshva Hasta Padasana Utthita Trikonasana Virabhadrasana II Parshva Konasana (hands on the waist) Virabhadrasana I Prasaritta Padottanasana (Head Down-Concave back)
Cool-Down	Eka Pada Pawan Muktasana Dwi Pada Pawan Muktasana Jathara Parivatasana Variation Supta-Padangustasana I	Eka Pada Pawan Muktasana Dwi Pada Pawan Muktasana Dandasana Urdhva Hasta Dandasana Padangustha Dandasana Paschimottanasana Chatuspadasana as Setu Bandha Sarvangasana
Pranayama	10 Min Pranayama (Observe breathing-10 min)	10 Min Pranayama (Observe breath where it starts where it ends)
Shavasana-Meditatiton	Shavasana (5 min)	Shavasana (5 min)

The program development process, as previously described, was informed by both classical and modern literature, along with expert opinions. Subsequently, the main components of the intervention were differentiated for the two groups—those conducted in-person and those conducted online, as detailed in Table 3.6. The following table presents the key features of the intervention for both groups, including session location, technical setup, teaching strategies, use of props, attendance tracking, and fidelity of monitoring.

Table 3.6. Comparative Overview of In-Person and Online Yoga Programs

Major Components	*In-Person*	*Online*
Session Location	-University sports hall	-Home-based practice
Session Time	Wednesday 7-8 pm Saturday 4-5 pm	Tuesday 8-9 pm Thursday 8-9 pm
Technical Infrastructure	Not applicable	-Home internet -The mobile operator's internet -Zoom-Premium -40inch TV -2 cameras (one laptop, one phone)
Visibility Support	-Demonstrated poses from various positions in the hall	-2 cams provided a different view angle -Change cameras position if needed
Group communication	No group communication tools used	A WhatsApp group created for coordination and announcements
Teaching Approach	-Mirror method in front of participants -Real-time/personalized/verbal feedback -Hand adjustment	-Mirror method in front of the screen -Real-time/personalized/verbal feedback -No hand adjustment
Access to Materials / Extra Practice	-Program not shared with participants - No additional practice advised	- No recordings allowed - Program not shared with participants - No additional practice advised
Props Used	-Belt -Weight (0.5 kg) -Wall	-Belt -Weight (0.5 kg) -Wall
Attendance Tracking	By the instructor during the course	By the instructor during the course
Make-up Sessions	2 sessions added at the end of the intervention	2 sessions added at the end of the intervention
Attendance Rate	88.49%	86.84%
Drop-Out Rate	9.54%	5%
Fidelity Monitoring	-Observed 5 times -By the Tubitak Project (1002) scholar -Schedule was shared beforehand, and verbal feedback was provided on time	-Observed 5 times -By the Tubitak Project (1002) scholar -Schedule was shared beforehand, and verbal feedback was provided before the course

Table 3.6. (continued)

Competence of the Instructor	Same instructor for both groups	Same instructor for both groups
Schedule	An identical weekly schedule was followed	An identical weekly schedule was followed

As shown in Table 3.5, both the in-person and online programs were designed to meet the specific needs of each program. Below, each principal component is explained by highlighting the similarities and differences between the in-person and online in terms of session location, technical infrastructure, visibility support, group communication, teaching approach and feedback, access to materials or extra practice, props used, attendance tracking, make-up sessions, attendance rate, drop-out rate, fidelity monitoring, instructor competence, and schedule.

Session Location and Technical Infrastructure: The in-person yoga sessions were held in a designated campus sports hall, providing a consistent physical environment. Online sessions, on the other hand, were conducted in participants' homes. The in-person sessions were scheduled on Wednesdays from 7:00 to 8:00 PM and Saturdays from 4:00 to 5:00 PM, while the online sessions were held on Tuesdays and Thursdays from 8:00 to 9:00 PM. No technical support needed for in-person group; however, technical setups are needed for online group. For online group, home internet or mobile data access, Zoom-Pro for live video conferencing, licensed for use through METU, a 40-inch TV for improved visibility, and a dual-camera setup (using both a laptop and a phone) to provide varied angles during instruction were set. Camera positions were adjusted as needed to ensure optimal visual clarity.

Visibility Support: At the in-person program, the instructor demonstrated yoga poses from various positions throughout the hall. The instructor occasionally moved around the room, but all new pose demonstrations were consistently given at the front of the class. On the other hand, in the online program, the instructor used two camera angles and adjusted them during the session as necessary to ensure visibility of the pose.

Group Communication: No WhatsApp group was created for the in-person participants, as the course schedule remained consistent throughout the 16 sessions and required no further updates. In contrast, a WhatsApp group was established for the online participants to facilitate one-way communication from the researcher. The

group was used exclusively to share Zoom links at least 30 minutes before each session and to send timely reminders about course times, and also offer technical support when needed (e.g., troubleshooting Zoom access or sound issues). It was not intended for group discussion or peer interaction, and communication was limited to organizational updates provided by the instructor.

Teaching Approach: Unlike other yoga styles, the Iyengar method emphasizes the importance of demonstration (Iyengar & Iyengar, 2003). The instructor provided real-time, personalized feedback and helped participants adjust their poses to ensure they used correct alignment and technique. In this study, the mirror technique was used to demonstrate yoga poses. The mirror method is a technique where the instructor faces the students and performs movements as if the students are looking into a mirror. It is most useful in a group class because it is strongly recommended for flow-style or dynamic yoga classes, as it facilitates synchronization, understanding, and participation (AlphayogaschoolAdmin, 2024; Douglah, 2020; Iyengar & Iyengar, 2003; Stephens, 2012).

In the mirror technique;

- The teacher does the opposite side of what she/he is teaching (i.e., the teacher lifts her/his left leg, while saying "lift your right leg").
- Helps students follow more easily without confusion. It is supported in yoga teaching literature for improving visibility and learning.
- Enables students to follow more easily because they can mirror the teacher's movements without needing to reverse sides mentally.
- Provides visibility and clarity because students face the teacher and do not need to turn their necks or change position to see the demonstration.
- Enhances body awareness through multimodal cues such as verbal instructions, visual demonstrations, gestures, facial expressions, and the use of tools like mirrors.
- Prevents physical strain during instruction.

According to the literature mentioned above, the mirror method was utilized in both groups.

The teaching approaches and feedback strategy in this study were informed by Basic Guidelines for Teachers of Yoga by Geeta S. Iyengar and B.K.S. Iyengar (2003). This guide provided foundational principles for delivering effective yoga instruction, including the use of clear verbal cues, accurate posture demonstrations, attentive observation, and timely, appropriate corrections. During the intervention, these principles were carefully applied across both the in-person and online programs.

The following general principles are derived from the Basic Guidelines for Teachers of Yoga and adapted for use in both in-person and online settings. These guidelines helped ensure clarity, safety, and engagement during instruction, supporting effective teaching and learning among both groups. It is indicated in parentheses which group(s) the guideline was applied to.

- The teacher positioned herself where she was visible to all students (for both groups).
- Duration of the poses was (Iyengar, 2001);
    - Standing poses: 20-60 seconds
    - Seated poses: 20-60 seconds
    - Forward bends: 30-60 seconds, gradually increasing
    - Twists: 20-30 seconds each side
    - Inversions (like shoulderstand, with props): Start with 1 minute or less
    - Restorative poses for menstruation participants: 3–5 minutes
- Movements were demonstrated from multiple angles, especially in the in-person group.
- Every yoga pose was visually demonstrated, as visual demonstrations are more effective than verbal explanations (for both groups).
- Instructions were limited to two or three key points per pose to avoid detailed instructions (for both groups).

- If any menstruating women were in the groups, inversions, abdominal asanas, and twists were eliminated, and instead forward extensions, supine yoga poses were instructed for them (Iyengar, 2014) (for both groups)
- Instructions were repeated using slightly different wording to reinforce understanding (for both groups).
- Attention was given not only to front-row students but also to those further away (for the in-person group).
- Poses were demonstrated 2–3 times initially to provide a clear image (for both groups).
- Instructions were repeated for both sides of the body (for both groups).
- The teacher ensured her voice was heard by all participants (for both groups).
- Demonstrations matched verbal instructions (for both groups).
- Extended explanations were avoided (for both groups).
- Pose names were introduced first in Turkish, then in Sanskrit (for both groups).
- Hand adjustments were only applied when necessary, and students were asked if they felt uncomfortable or preferred not to be touched (for in-person group).
- When props were used, the teacher first demonstrated with the prop before asking students to use it (for both groups).
- No student was pushed beyond their physical limits (for both groups).
- Only demonstrates the mistakes that you observed in the participants. Then show how to correct them (for both groups).
- Students were encouraged to try poses, with an emphasis on building confidence and respecting individual fears and limitations (for both groups).

Access to Materials and Extra Practice: Maintaining the structure and consistency of the intervention, the daily program was not shared with participants in either the in-person or online groups. In the online sessions, no recordings were made, and recording was not permitted. Additionally, participants were not encouraged to engage in any yoga practice beyond the scheduled intervention sessions. This approach ensured that all participants in both groups received a standardized experience guided solely by the instructor during the intervention sessions.

Props, Attendance, Make-Up Sessions, and Participation Metrics: Participants in both groups used yoga props, such as yoga belts and 0.5 kg weights, as well as wall support, to aid in alignment and safety practices. Participants arranged their mats and props. They were asked to bring the necessary props before the session in which the props would be used.

The instructor recorded attendance during every session. If a session was missed, the reason was asked in a friendly manner, which helped encourage regular attendance. To accommodate absences, two make-up sessions were added at the end of the intervention for both groups. Students who have not missed a course are not allowed to attend make-up courses. As a result, a notably high attendance rate was seen in both groups. The overall attendance rate in the in-person group was 88.49%, and in the online group was 86.84%. However, the online group demonstrated a lower drop-out rate (5%) than the in-person group (9.54%).

Program Fidelity: To ensure the fidelity of the intervention, the checklist attached to Appendix R was used. Data were collected to assess whether the sessions were conducted according to the set plan. The fidelity criteria were organized under specific headings as follows:

- Starting the session at the scheduled time
- Completing the 45-minute yoga practice
- Including the 10-minute basic pranayama (breathing practice) and the final 5-minute Shavasana/meditation
- Demonstrating newly introduced yoga poses
- Providing quality and clear explanations during the session
- Giving real-time verbal or physical feedback to participants
- Following the planned program content
- Responding to participants' questions

The attached checklist of fidelity (Appendix R) was applied to both groups. The fidelity of the intervention was observed through five observation sessions per group, with observation dates selected randomly by the observers. Both groups were monitored by a project scholar from TÜBİTAK-1002. In each case, the yoga program

was shared in advance with observers. Due to the suitability of the classroom environment, the observer in the in-person group was verbally informed about the stage of the session and the name of the yoga pose. This assistance was not possible in the online sessions due to technical limitations. However, information was provided to the online observer before the course started. As a result, the observers of both programs indicated in their completed forms whether the course content was consistent with the planned program or not.

Competence of the Instructor: A certified yoga instructor led the intervention with a 200-hour Hatha Yoga Teacher Training certificate and teaching experience both abroad and in Türkiye. Additionally, the instructor completed a six-month training program at the Ramamani Iyengar Memorial Yoga Institute (RIMYI) in Pune, India, and has participated in international workshops and yoga courses conducted by senior Iyengar yoga teachers since 2015.

3.5. Data Collection Instruments

At both the beginning and end of the intervention, all participants underwent a comprehensive set of assessments. These assessments included a Physical Activity Readiness Questionnaire (PAR-Q) and various tests designed to evaluate physical fitness parameters (strength, balance, and flexibility). Furthermore, a body composition analysis was conducted. Participants also completed the Statistical Information Questionnaire, Perceived Health Status Questionnaire (PHSQ), the Perceived Stress Scale (PSS), and the Yoga Self-Efficacy Questionnaire (YSEQ). Notably, only the in-person and online yoga groups participated in additional assessments, which included the Adherence to Yoga Questionnaire (AYQ) and semi-structured interviews. During these interviews, participants were encouraged to respond to open-ended questions, allowing them to share their experiences and perspectives in greater depth. Table 3.7 lists the variables to be investigated in the study, along with the methods used to measure them.

Table 3.7. Instruments Used for Quantitative and Qualitative Data Collection

Variables	Quantitative Data Collection Tools	Qualitative Data Collection Tools
Readiness of Physical Activity	Physical Activity Readiness Questionnaire (PAR-Q)	Semi-Structured Interview
Strength	Hand Grip Strength Test (HGST) Sit Up Test (One Minute)	
Balance	Single Leg Balance Test	
Flexibilty	Sit and Reach Test Back Scratch Test	
Body Composition	BMI and Body Fat Percentage (BFP)	
Perceived Health	Perceived Health Status Scale	
Perceived Stress	Perceived Stress Scale	
Yoga Self-Efficacy	Yoga Self-Efficacy Scale (YSES)	
Adherence	Adherence to Yoga Questionnaire (AYQ)	

3.5.1. Physical Activity Readiness Questionnaire (PAR-Q)

The American College of Sports Medicine (Riebe et al., 2018) states that the Physical Activity Readiness Questionnaire (PAR-Q) is the most effective method for assessing individuals who are not clinically trained. The Physical Activity Readiness Questionnaire is a helpful tool in health and fitness settings that helps determine if someone is ready to exercise without putting their health at risk. This tool is invaluable for individuals who already have health issues or have been inactive for an extended period. The Questionnaire helps people identify potential health hazards associated with exercise, encouraging them to do so safely. It is one of the most widely used screening methods for finding exercise-related risk factors (Bredin et al., 2013). The Physical Activity Readiness Questionnaire is a brief, self-administered questionnaire with seven questions that aims to identify common medical issues that may increase the risk of injury or adverse event during exercise. These inquiries typically assess whether the person has ever experienced heart problems, chest pain, dizziness, joint pain, or other symptoms that may require caution. If someone responds "yes" to any of the questions, they should obtain medical permission before engaging in any moderate or vigorous exercise. This process is crucial in preventing unnecessary health risks during exercise, especially in structured fitness programs. It serves as an early screening tool to ensure individuals with specific health risks are referred for medical advice before starting an exercise regimen (Thomas et al., 1992; Warburton et al., 2011).

Healthy women were one of the eligibility requirements for the intervention, which comprised an eight-week physical exercise program; therefore, these questions were asked to be answered before the physical tests. According to the questionnaire results, everyone is eligible to participate in both the intervention and the physical tests.

The Turkish adaptation of the Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) is known as *EGZ-A+* in Turkish and has demonstrated high test-retest reliability (r=0.87, p< 0.001), confirming its suitability for pre-exercise screening in Turkish primary care settings (Ertekin, 2018). Permission was obtained from the author for the use of the test. Once the questionnaire was administered, the researcher immediately analyzed the results before conducting the physical tests. According to the questionnaire results, everyone is eligible to participate in both the intervention and the physical tests.

3.5.2. Statistical Information Questionnaire

The statistical information form was designed and administered to all participants (N=57) to properly assess elements of physical activity habits. The Statistical Information Questionnaire attached to Appendix D had 17 questions organized into four thematic sections: (1) socio-demographic information, (2) health and lifestyle behaviors, (3) perceived barriers to physical activity, and (4) psychosocial views on behavior change and educational experiences. The form was designed based on behavioral and ecological models (Cerin et al., 2010; Herazo-Beltrán et al., 2017; Ilić et al., 2024) to analyze individual, interpersonal, and environmental variables influencing physical activity participation at several levels.

The first section (Items 1–10) gathered data on age, education, marital and employment status, employment sector, residence, and income level. These items formed a basis for subgroup analysis based on demographic and socioeconomic variables, which are known to affect physical activity participation and the perception of barriers (Koh et al., 2022; Borodulin et al., 2016).

The second section (Item 11) asked participants to indicate which health-related habits they engaged in at least four times per week (e.g., smoking, sleep, diet, screen time, and physical exercise). This item was designed to capture behavioral patterns that may correlate with physical activity engagement or reflect broader lifestyle choice profiles.

The third section (Items 12–14) examined perceived barriers to physical activity, categorized into three empirically supported domains:

Psychological and emotional barriers (e.g., lack of motivation, shame, fear of injury), capturing intrapersonal emotional and cognitive states that inhibit behavior (Edmunds et al., 2013; Dombrowski, 2011),

Personal barriers (e.g., time constraints, fatigue, financial limitations), reflecting individual-level limitations rooted in daily routines and perceived effort (Herazo-Beltrán et al.; Bowles et al., 2002)

Environmental barriers (e.g., poor infrastructure, safety concerns, lack of social support), align with contextual and structural determinants of behavior consistent with ecological frameworks (Koh et al., 2022; Ilić et al., 2024).

Participants were allowed to select up to three items per category, enabling identification of their most prominent perceived obstacles to regular physical activity.

The final section (Items 15–17) addressed self-efficacy and educational context, adding a psychosocial dimension to the analysis. Item 15 measured self-confidence in behavior change, aligned with Bandura's Social Cognitive Theory, which defines self-efficacy as a key determinant of motivation and sustained action (Bandura, 1997). This item provided insight into individuals' perceived ability to initiate or maintain physical activity and health-related behaviors. Items 16 and 17 assessed participants' experiences with distance and face-to-face education, respectively, using 10-point rating scales. These questions aimed to capture satisfaction and perceptions regarding educational formats during and after the COVID-19 pandemic, with attention to aspects such as enjoyment, convenience, benefit, and opportunities for social

connection—factors that may indirectly influence lifestyle choices, including physical activity.

Overall, the statistical information form was designed to be concise, structured, and multidimensional, enabling a comprehensive understanding of how personal, social, and contextual factors interact to shape young adults' physical activity behaviors and perceived barriers.

3.5.3. Physical Fitness Assessment

Data on strength, balance, flexibility, and body composition before and after the measurements were collected. The hand grip and sit-up tests were used to measure strength, while the sit-and-reach and back scratch tests were used to measure flexibility. The single-leg stance test was used to examine balance. Body composition was also assessed by determining the Body Mass Index (BMI) and Body Fat Percentage (BFP).

Standardizing exercise testing ensures that the results are reliable, valid, and safe assessments. This lets people and groups compare their results consistently (ACSM, 2018; Atkinson et al., 1998; Morrow et al., 1994; Riebe et al., 2018; Pescatello et al., 2014). Because of this, the study followed conventional procedures for both the individuals and the testing setting. The tests took place in a calm, well-ventilated environment with controlled conditions to ensure the participants were comfortable and less stressed. There was a chair to sit in, and workers were calm and helpful (Heyward, 2006).

Another crucial aspect of the test's validity and reliability is the readiness of the participants before and following the test. To ensure readiness, an email titled "Guidelines for Test Preparation" was sent to participants several days before the test date. This email provided detailed instructions on testing protocols and preparation requirements, both before and during the test. The email included as Appendix B emphasized three key areas for participant preparation: Nutrition, Physical Readiness, and Post-Test Responsibilities.

This email included clear advice on how to prepare for and take the test, both before and during it. Appendix B of the email emphasized three key areas for participants to prepare: nutrition, physical readiness, and post-test responsibilities.

The email gave precise advice on what to eat in the days leading up to the test and on the day of the test. For physical preparedness, participants were instructed to wear comfortable clothing that allowed them to move freely. Additionally, participants were instructed to perform a warm-up that included light repetitions of the test exercise and engage in moderate aerobic activity for five to ten minutes, followed by dynamic stretching, before the muscular conditioning test. It was also important to have a cool-down regimen after the exam that included flexibility exercises that slowly lowered the amount of effort and intensity (Riebe et al., 2018). We sent out emails with pictures of the warm-up and cool-down routines and put them on the wall near the warm-up and cool-down area in the test lab.

This intervention employed the testing order suggested by ACSM (Riebe et al., 2018). We utilized Riebe's (2018) ideas to alleviate the stress associated with taking tests. The general framework proposed by ACSM for organizing physical fitness assessments is summarised as follows (Riebe et al., 2018):

1. Anthropometric measurements
    - Height
    - Weight
    - Body composition

2. Muscular Strength Tests
    - Hand grip strength test
    - Sit-up test

3. Balance Tests
    - Single-leg balance test
4. Flexibility Tests
    - Sit-and-reach test
    - Back scratch test

This intervention employed the testing order suggested by ACSM (Riebe et al., 2018). Riebe (2018) recommended ways to lower stress before an exam, and those were used.

These included providing clear directions, allowing participants to practice tests in advance, demonstrating how to complete tasks, and offering calm verbal encouragement to reduce stress and support their performance. (Riebe et al., 2018).

3.5.3.1. Strength Tests

Strength is a crucial aspect of yoga, as it enhances balance, posture, and flexibility, and helps prevent injuries (Bhowmik & Ray, 2024; Polsgrove et al., 2016). In this study, the handgrip strength test was employed to measure the maximum force exerted by a muscle in a fixed position without any joint movement (Massy-Westropp et al., 2011). Additionally, according to the ACSM (2018), the sit-up test was utilized to evaluate muscular endurance, specifically the capacity of muscles to perform repeated contractions or sustain a static contraction over time (Riebe et al., 2018).

3.5.3.1.1. The Implementation of the Hand Grip Strength Test (HGST)

Handgrip strength (HGS) is a widely used measure of grip force and an important indicator of overall muscular strength and functionality. It provides valuable insights into general health when considered alongside other biological parameters (Quattrocchi et al., 2024). The Hand Grip Strength Test (HGST) assesses the strength of hand and forearm muscles at rest and is commonly used in both clinical and fitness settings to evaluate muscle function (Roberts et al., 2011). It is also a strong predictor of general strength, health outcomes, and athletic performance (Bohannon, 2008; García-Hermoso et al., 2018; Leyk et al., 2007).

In clinical studies that included yoga (Lai et al., 2023; Reuter et al., 2011), the Hand Grip Strength Test has been demonstrated to be a viable and reliable method for measuring muscle fitness and assessing rehabilitation effects. Across several experiments, the HGST is reasonably reliable when retested. According to Bai et al. (2019), an Intraclass Correlation Coefficient (ICC) of 0.974 (95% CI=0.963, 0.982) was reported. Villafañe et al. (2016) demonstrated that HGST is quite reliable in older individuals, while Nikodelis et al. (2021) showed that different dynamometers are highly accurate. This level of reliability makes sure that changes in grip strength during

things like yoga are real improvements and not just mistakes in measuring. Another sign of general physical competence is grip strength. Vaishya et al. (2024) stressed its importance as a health biomarker and even a new vital sign, while Telles et al. (2011) showed that yoga can help people with rheumatoid arthritis get stronger grips.

In short, HGST is a reliable and valid way to measure the effects of yoga. We followed a standard methodology suggested by the American College of Sports Medicine to do this test (Riebe et al., 2016).

1. Preparation: A handgrip dynamometer was needed to perform the test. A selected dynamometer was calibrated and validated for accuracy. Before the test, the participants were shown how to perform the test in a practical setting. The grip bar was adjusted so that the second knuckle of the fingers fits comfortably under the handle and takes the weight of the instrument. The dynamometer was set to zero. Grip strength should be assessed while participant standing (Figure 3.4).



Figure 3.4. Hand Grip Strength Test Demonstration (OpenAI, 2025)

2. Starting Position: The subject was instructed to place their feet flat on the floor and to hold their arms parallel to the body, elbow extended, ensuring a neutral standing posture throughout the test (Barut & Demirel, 2012). The fingers should wrap around the handle, and the thumb should be placed over the top of the dynamometer to secure the grip. The arm should be positioned at the side of the body, with the wrist in a neutral position (not flexed or extended). This positioning helps to isolate the grip

strength measurement and reduces the influence of other muscle groups. For the right and left hands, this procedure had been done twice, with a pause between each.

3. **Execution:** Participants were instructed to exert maximum effort during the test. Clear verbal instructions were provided, emphasizing the importance of squeezing the dynamometer as hard as possible. Participants should be encouraged to take a deep breath and relax their muscles before each attempt. Participants squeezed the dynamometer with maximal effort for approximately 3-5 seconds without holding their breath. The tester should ensure that the participant maintains the correct posture and grip throughout the execution. Neither the hand nor the hand dynamometer should touch the body or any other object. Before it started, the participants were asked to make an experiment for their right and left hands to squeeze once, without using too much force.

4. **Measurement:** The highest value obtained from the two attempts was recorded. It is essential to note the unit of measurement (kg) and to ensure that the dynamometer is reset to zero before each attempt to avoid cumulative errors.

5. **Scoring:** The score recorded in kilograms is seen on the display. The total score of the individual was calculated by summing the highest score obtained from both hands.

3.5.3.1.2. The Implementation of Sit Up Test (One Minute)

The one-minute sit-up test is a reliable and valid measure of abdominal muscular endurance, linked to improved core strength and overall fitness. Diener (1992) supports its effectiveness, while Bianco et al. (2015) highlight its usefulness as a practical field test, especially for sedentary individuals.

The validity and reliability of the sit-up test demonstrate that it is a generally acceptable method for evaluating this fitness component, although results may vary depending on the specific population and protocol used. The Sit-Up Test has demonstrated high test-retest reliability in young adult populations, with correlation coefficients often exceeding 0.90 (Augustsson et al., 2009)

A standardized protocol was applied for the implementation of the sit-up test (Riebe et al., 2018). The test was conducted using the following procedural steps:

1. Preparation: Participants should lie supine on a flat surface with their knees bent at a 90-degree angle and their feet firmly placed on the ground, secured by an assistant to minimize movement during the test. Hands should be positioned at the sides of the head, with fingers resting lightly over the ears. Participants are instructed to curl upward until their elbows touch their knees, then lower their torso back down until their shoulders touch the mat, ensuring that the elbows remain directed forward throughout the movement (Bianco et al., 2015). The assistant is responsible for maintaining the participant's feet on the mat throughout the test. As participants rise, the elbows should move forward consistently until they touch the knees. During the movement, the hands must stay at the sides of the head with fingers over the ears (Figure 3.5). The return phase to the starting position should be controlled, allowing the shoulders to touch the mat. Participants are required to perform as many sit-ups as possible within one minute (Brill et al., 2000).



Figure 3.5. One-Minute Sit-Up Test Demonstration (OpenAI, 2025)

2. Starting Position: In preparation for the test, the participants were given a demonstration of how to execute the test in a practical setting.

3. Execution: After the necessary explanations have been given and before the test begins, a subject repeats the entire movement once to ensure that the explanations have been correctly understood.

4. Measurement: The timer starts on the 'Ready and Go' signal and stops after one minute. Each correct sit-up is verbally counted. A complete sit-up consists of the upper body straightening to a sitting position, elbows touching knees, and shoulders returning to the mat. If a number is not called out, it shows that the shuttle was not done properly.

5. Scoring: Within 60 seconds, the correct and completed sit-ups are counted and recorded as a score.

3.5.3.2. Flexibility Tests

Flexibility, essential in yoga, allows joints to move fully and supports alignment, reduces stiffness, aids balance, and helps with advanced poses (Chaudhary et al., 2021; Luo et al., 2023; Jones et al., 2002; Riebe et al., 2018; Woods et al., 2007). The Sit and Reach Test (SRT) and Back Scratch Test (BST) are widely used measures of flexibility, a key aspect of yoga practice. The Sit and Reach Test assesses hamstring, lower back, and hip flexibility, crucial for forward bends and seated stretches (Riebe et al., 2018). Back Scratch Test evaluates shoulder flexibility, essential for poses in yoga like *gomukhasana* (cow-face pose) and arm-extending postures (Smith,2024; Jones et al., 2002).

Both tests are reliable, valid, and relevant for quantifying flexibility improvements in yoga studies (Castro-Piñero et al., 2009; Csala et al., 2021; Luo et al., 2023). SRT uses a sit-and-reach box, while the BST requires only a ruler or tape measure, allowing for easy implementation (Jones et al., 2001).

3.5.3.2.1. The Implementation of the Sit and Reach Test (SRT):

The Sit-and-Reach Tests (SRT) are widely used in flexibility and yoga studies due to their simplicity and effectiveness in assessing hamstring and lower back flexibility, both of which are essential for many yoga poses. Common variations include the Standard, Modified, Back-Saver, V-Sit-and-Reach, and Chair Sit-and-Reach Tests (Hui et al., 2000). The Standard Sit-and-Reach Test (*hereinafter referred to as the sit and reach test*) is often preferred in yoga research due to its simplicity, broad acceptance, and relevance in measuring flexibility improvements associated with yoga practice (Amin et al., 2014; Bal & Kaur, 2009). Therefore, it was utilized in this study,

The Sit and Reach Test has been shown to have good reliability and validity for measuring hamstring flexibility, although it may not accurately reflect lumbar flexibility (Muyor et al., 2014; Mayorga-Vega et al., 2014). The reliability of the SRT has been established in several Turkish studies, demonstrating its consistency as a measure of flexibility (Kabul et al., 2018; Şahiner et al., 2010; Tan et al., 2021). For instance, a study highlighted the SRT as a reliable tool for assessing flexibility in recreational male football players, confirming its utility in sports settings (Seçer et al., 2021). The study emphasized that the SRT is a valid and reliable method for evaluating flexibility.

The Sit and Reach Test was performed according to the procedures outlined in the ACSM Manual by Riebe et al. (2018). The following steps were followed to perform the SRT:

1. Preparation: The participant was instructed to remove their shoes and sit on the floor with their legs extended straight ahead. The soles of the feet should be approximately hip-width distance apart, and the participant's knees should remain straight throughout the test with bare feet. A sit-and-reach box, which has a measuring scale attached to the top, should be positioned in front of the participant. The box should be calibrated to ensure accurate measurements. A subject sits on the floor with the sole of the bare foot flat on the test box (Figure 3.6).



Figure 3.6. Sit-and-Reach Test Demonstration (OpenAI, 2025)

2. Starting Position: The participant sits with their back straight and feet flat against the edge of the box, ensuring that their heels are aligned with the measuring scale. The toes should be pointed upward, and the knees must remain fully extended throughout the test. Participants are instructed to place one hand on top of the other with the middle fingers overlapping.

3. Execution: Participants were told to reach forward along the measuring device as far as possible, keeping their knees straight. The reach should be performed in a slow and controlled manner to avoid injury (Mayorga-Vega et al., 2014). The practical implementation was demonstrated to the participants to prepare them for it. They were told to inhale deeply and, while exhaling as they reach forward, hold the position for a moment to allow for accurate measurement. Importantly emphasized that the participant should not bounce or jerk during the reach, as this could lead to injury and affect the validity of the results. The test was carried out twice.

4. Measurement: The distance reached is recorded at the point where the fingertips touch the measuring scale. The best of two trials is typically recorded to account for variability in performance (Muyor et al., 2014).

5. Scoring: The score was measured in centimeters from the starting position (where the fingertips are at the edge of the box) to the furthest point reached. Following the initial measurement, the nail length of participants with long or decorative nails was recorded. The nail length was then reduced from the final results to ensure accuracy.

3.5.3.2.2. The Implementation of Back Scratch Test (BST):

The Back-Scratch Test (BST), also known as the Apley Scratch Test, is a common tool for assessing upper-body flexibility, particularly shoulder mobility. Yoga frequently emphasizes shoulder flexibility due to various arm movements and overhead poses, such as Downward-Facing Dog and Handstand (Kaminoff et al., 2012). The test involves reaching one hand over the shoulder and down the back to touch or overlap the fingers of the opposite hand placed behind the back (Foley et al., 2016; Gavilán-Carrera et al., 2019).

The Back-Scratch Test (BST) is a simple and practical way to measure shoulder flexibility. Unlike complex tools like goniometers, the BST is easy to use and doesn't require much training (Foley et al., 2016). It has been shown to reflect upper-body flexibility well and is commonly used in yoga studies to track flexibility improvements (Goethe et al., 2016; Petrič et al., 2014). The test also links to functional outcomes and provides consistent results (Carbonell-Baeza et al., 2011). Because it's quick and practical, the BST is a useful tool for both research and yoga practice.

Test-retest reliability of the BST was with studies reporting intraclass correlation coefficients (ICC) was 0.96, indicating strong reliability across repeated tests under consistent conditions (Rikli et al., 1999). Keith et al. (2014) reported that the test has a high-reliability coefficient (left-hand *rxy*=0.77 and right-hand *rxy*=0.75). Cronbach's Alpha internal consistency coefficient was 0.83 for the left and right hands.

1. Preparation: Performing the test, a measuring tape, a flat surface for the participant to stand on, and a clear space to ensure safety were needed. Information was given to the participant about the purpose of the test and clear instructions on how to perform the movements. It was ensured that participants understood the importance of attempting to touch or overlap their fingers behind their backs. It was ensured that the individual was dressed comfortably so that their arms and shoulders could move freely (Figure 3.7). Participants were given a demonstration of how to perform the test in a practical setting in preparation for the test (Rikli et al., 1999).

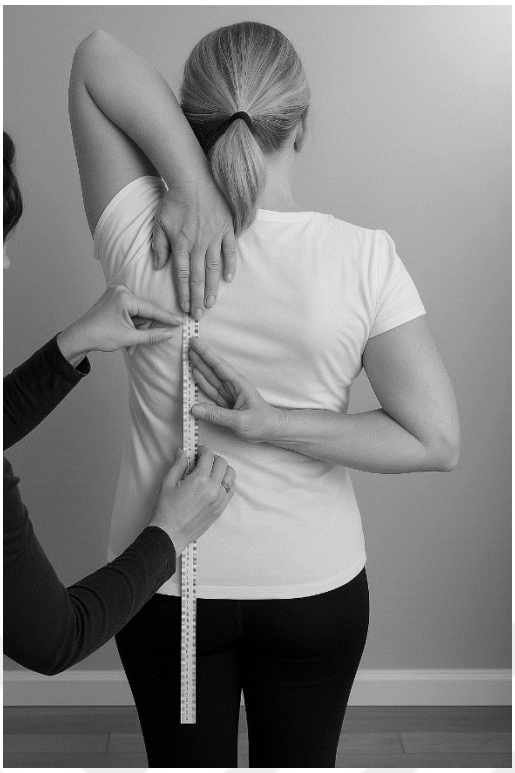


Figure 3.7. The Back-Scratch Test Demonstration (OpenAI, 2025)

2. Starting Position: The participant stands with her back straight. The participant raised one arm (starting with the right hand) over their shoulder, bending the elbow so that the hand reached down the back. The other arm should be positioned behind the back, with the palm facing outward and fingers extended upward. Ensured that the participant maintained a neutral spine and relaxed shoulders throughout the test. The participant stood upright with their feet shoulder-width apart. As a result, one arm was raised overhead, and the other arm was placed behind the back with the palm facing outward. The goal is for the fingers of both hands to touch or overlap behind the back (Jones et al., 2002; Riebe et al., 2018).

3. Execution: The participant was instructed to reach with one hand down behind their head and back, while simultaneously reaching up behind their back with the other hand. The participant should move slowly and avoid straining or bouncing. The movement should be performed slowly to avoid injury (Heyward, 2010).

Care was taken to record the measurement accurately, noting whether the fingers touched, overlapped, or how far apart they were. In case the participant had long nails

or artificial nails, the measurement was taken from the beginning of the nail. The participants performed the test twice, alternating hands for each trial. The best scores from these attempts were recorded for analysis.

4. Measurement: The distance between the tips of the middle fingers was measured. If the fingers overlap, the overlap distance was measured as a positive value. If the fingers did not touch, the gap was measured as a negative value. The score is zero if the fingertips make a touch (Heyward, 2010; Jones et al., 2002).

5. Scoring: The participant's score was the distance between the fingers in centimeters. Positive scores indicated overlap, while negative scores indicated a gap. The score was used to evaluate shoulder flexibility, with higher scores (more overlap) indicating better flexibility (Rikli et al., 2001).

3.5.3.3. Balance Test

A Balance Test is an assessment that evaluates an individual's ability to maintain stability in various positions, either while standing still (static balance) or during movement (dynamic balance). It tests the coordination between sensory inputs, including vision, proprioception, and the vestibular system, which together help control posture and equilibrium (Horak, 2006). Balance tests are often used in clinical settings, sports science, and rehabilitation to assess risk factors for falls, athletic performance, or the effectiveness of treatment interventions (Marcori et al.,2022).

In yoga studies, balance tests are important because yoga poses often require the practitioner to hold positions that challenge their balance. The integration of balance tests into yoga research allows scientists and practitioners to measure how well yoga improves balance and postural control over time (Patel et al., 2016). Yoga has been found to enhance proprioception and balance by promoting mindfulness, muscle strength, and flexibility, which are critical for maintaining stability (Field, 2011). These studies often focus on populations such as older adults, athletes, or individuals recovering from injury, where improved balance is associated with better quality of life and reduced injury risk (Youkhana et al., 2016).

The Single Leg Balance Test (SLBT) was used in the research as it can be preferable for yoga studies due to focusing on unilateral stability, testing improved proprioception, relevance to functional movement, identifying muscle imbalances (Field, 201; Horak, 2006; Patel et al., 2016; Youkhana et al.,2016).

3.5.3.3.1. The Implementation of Single Leg Balance Test (SLBT):

Studies demonstrated that yoga exercises positively impact balance, flexibility, and strength in athletes, suggesting that the incorporation of balance assessments under different visual conditions can enhance understanding of how yoga practice influences these attributes (Kartal & Ergin, 2020). Although there are different applications of the single-leg balance test, in this study it was performed on both legs dominant and non-dominant legs with eyes open and eyes closed condition for one minute.

The assessment of balance through single-leg tests, particularly under conditions of eyes open and eyes closed, while distinguishing between dominant and non-dominant legs, is essential for understanding postural stability and functional performance. This multifaceted approach provides valuable insights into how visual input and leg dominance influence balance capabilities (Hoffman&Payne, 1995). One of the primary reasons for utilizing both eyes-open and eyes-closed conditions in yoga studies is to evaluate the reliance on visual feedback during balance tasks. Yoga poses often require practitioners to maintain balance in various postures, and the ability to do so without visual input can significantly challenge an individual's proprioceptive and vestibular systems (Gauchard, et al., 1999; Mohanty et al., 2014).

Understanding the difference between dominant and non-dominant legs is important for evaluating balance. Looking at both leg dominance and visual input helps us see how these factors affect balance, which is especially useful in yoga practice (Linn et al., 2022). This approach also shows how vision helps maintain stability and how each leg functions differently, which can guide training and rehab programs to improve balance and lower the risk of injury (Paillard & Noé, 2020). In summary, the combination of eyes-open and eyes-closed conditions, along with the assessment of dominant and non-dominant leg performance, provides a thorough understanding of balance capabilities.

The Single Leg Balance Test demonstrates acceptable inter-trial reliability (*ICC* = 0.60-0.81) and acceptable inter-test reliability (*ICC*=0.61-0.89) for rugby union players (Troester et al., 2018); inter-rater and intra-rater reliability were 0.922 (95% *CI*=0.864–0.956) for Thai patients with neck pain (Leungbootnak et al., 2024). Another research indicates that single-leg balance tests exhibit high inter-rater and test-retest reliability, with studies reporting reliability coefficients as high as 0.92 (Hung et al., 2021).

The test duration was selected as a 45-second one since it may be more appropriate for less experienced participants or to avoid fatigue-related instability. The following methods were used to perform the SLBT:

1. Preparation: A flat, stable surface is required for the test, along with a stopwatch or timer to measure the duration of the balance (Knight et al., 2010). Subjects were barefoot on a medium-hard mat. The time participants can stay on each leg is recorded. The maximum duration is 45 seconds. Before the test, the participants were instructed on how to execute the test in a simulated situation (Figure 3.8).

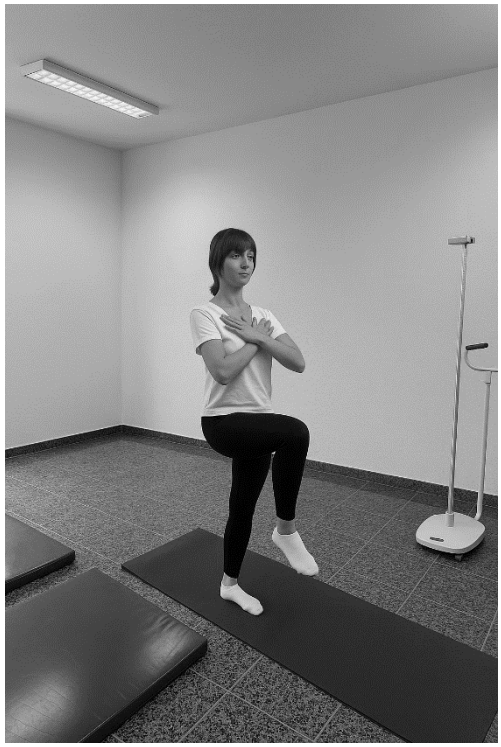


Figure 3.8. Single Leg Balance Test Implementation (OpenAI, 2025)

2. Starting Position: Participant were told to stand upright with their bare foot in feet' hip distance, ensuring a stable base before initiating the test (Elgohary et al., 2019). The participant should lift one leg off the ground and pull it toward the chest, bending the knee at approximately 90 degrees, while keeping the other leg straight (Śliwowski et al., 2021). Before assuming the balance position, cross his arms over the chest. (Springer et al., 2007). After subjects were placed in a testing position and told to stay balanced for 45 seconds. While three trials are often recommended for single-leg balance tests, studies indicate that two trials can be sufficient for reliable assessment, particularly when considering the context of the testing environment, and practicality. and the population being assessed (Marcori et al., 2022; Riemann et al., 2013). Therefore, the test was performed with eyes open and closed with both legs, and the 2-trial times of the test were written down on the record sheet while evaluating to determine the mean value (Leungbootnak et al.,2024; Springer et al.,2007).

3.Execution: The test was started eyes-open on the dominant leg. The eyes are looking in the same direction as the head. The eyes were even told to fix on a point on the wall. Start the timer as soon as the participant lifts their leg off the ground and stops it when they lose balance or touches the ground with the lifted leg (Ludwig et al., 2017). Moreover, if a subject opens her eyes during a closed-eye practice, touch the ground with the passive leg, alter the angle of the test foot through hopping or jumping, lift the front of your foot or heel, touch to support the leg with the passive leg, extend hip joint more than 30°, deviate body from the midpoint, touch the floor with foot, jump or bounce, or use any external support, means balance is impaired, and the time is noted (Hertel et al., 2002).

4. Measurement: It involves assessing the duration of balance. The time (in seconds) was recorded so that the participant could maintain their balance on one leg (Pawar, 2023).

5. Scoring: Scoring based on the duration of balance achieved. The score is simply the total time (in seconds) that the participant was able to maintain their balance on each leg. The test was run, and the mean value was obtained and evaluated as the outcome. A longer duration indicates better balance and stability, while shorter

durations may suggest a need for further assessment or intervention (Gaerlan et al., 2012; Krityakiarana et al., 2016; Leungbootnak et al.,2024).

3.5.3.4. Body Composition

Body composition measurements are important for understanding health, checking how well an intervention works (Choudhury et al., 2024), seeing the benefits of different types of exercise (McGuigan et al., 2009), comparing which exercises are more effective (Telles et al., 2014), and observing long-term changes in body composition (Innes et al., 2016; Nongkhai et al., 2021).

Assessing body composition is important for yoga studies because it provides insights into an individual's physical condition, helping to tailor yoga practices more effectively and monitor progress, preventing injury, and improving posture and alignment (Da Silva et al., 2019). Body Mass Index (BMI) and body fat percentage (BFP) were selected for measuring in this research. Research on BMI and BFP in yoga studies is crucial for understanding the impact of yoga on body composition and overall health. They are to evaluate the effectiveness of yoga as a therapeutic intervention for obesity and related health problems. Research on the effects of yoga on BMI and BFP has yielded mixed results, with some studies indicating minimal or no significant changes in these metrics (Choudhury et al., 2024; Csala et al., 2021; Kumar, 2023; Nongkhai et al., 2021; Popierz-Rydlewska et al., 2024; Varughese et al., 2023).

The implementation of BMI and BFP in this research, Tanita MC-780 MA, and a portable height measure tape were used (Figure 3.9). Tanita is a validated and reliable tool for assessing body composition across various populations, including adults, children, and adolescents. Its ability to provide accurate measurements of muscle mass, fat mass, and total body water makes it an asset in both clinical and research settings (Helder et al., 2018; Helder et al., 2022; Qadah et al., Simon et al., 2022).



Figure 3.9. Body Composition Test Implementation (OpenAI, 2025)

For measuring height, a portable stadiometer (Seca 213) was utilized (Figure 3.10).



Figure 3.10. Measuring Height Implementation (OpenAI, 2025)

It is important to emphasize once again that subjects had been advised to abstain from consuming any food at least three hours before the test. Additionally, it was recommended that the subject wear comfortable, lightweight clothing during the test. Height and weight measurements were taken while the subject was barefoot with no socks. BMI is calculated from body mass (M) and height (H). BMI = M / (H x H), where M is body mass in kilograms and H is height in meters.

3.5.4. Perceived Health Status Scale (PHSS)

The scale of "perceived health" is used to assess the general health of a population simply and effectively (Erengin et al., 1997). It is a subjective health indicator and shows how individuals evaluate their health (Erkin et.al., 2018). Even so, scale is widely used in the assessment of health status as it is closely related to objective health indicators such as mortality and morbidity (Şentürk et al., 2007)

The scale, attached in Appendix E, has only one item: "How do you perceive your current health status?", which is answered by selecting "very good" (1 point), "good" (2 points), "poor" (3 points), or "very poor" (4 points). When assessing the scale, 4 is considered the lowest score, and 1 is the highest.

3.5.5. Perceived Stress Scale (PSS)

Stress is measured through perceived stress and biological stress levels. The biological measurement of stress indicators is the hormones in the body. It is checked by the hormone cortisol, heart rate, and blood pressure (Chrousos, 2009). In this research, biological measurement is not applied. Perceived Stress Scale (PSS) is a classic stress assessment instrument originally developed in 1983 by Cohen et al. and a widely utilized instrument in yoga studies to assess the impact of yoga interventions on stress levels among various populations (Bansal et al., 2013; Jeter et al., 2013; Lee et al., 2022;). The Perceived Stress Scale, attached as Appendix F and G, measures the degree to which situations in one's life are appraised as stressful, making it particularly relevant in evaluating the psychological benefits of yoga practices (Berlowitz et al., 2020; Cohen et al, 1983; Prasad et al, 2016). Questions in this scale asked about the

feelings and stressful thoughts during the last month. Participants used a five-point Likert scale with 14 items and answered by selecting "Never" (0 points), "Almost Never" (1 point), “Sometimes” (2 points), “Fairly Often” (3 points), and “Very Often” (4 points). While PSS-10 scores were being calculated, items 4, 5, 7, and 8 reversed the scores on the positive scores. Higher overall scores indicate greater overall stress. Total scores range from 0 to 40.

The Perceived Stress Scale (PSS) has been adapted and validated for use in the Turkish population (attached as Appendix F), allowing researchers to effectively measure perceived stress levels across various contexts (Ayhan, 2023; Demirtaş et al., 2021; Demir et al., 2021; Güvenkaya, 2019; Sahmurova et al., 2022;). The latest adaptation of the PSS into Turkish was conducted by Eskin et al. (2013), who ensured its validity and reliability for the Turkish-speaking population. The Turkish version's Cronbach's Alpha internal consistency coefficient was 0.82, and test-retest reliability was 0.88. Their study confirmed that the Turkish version of the PSS maintains the psychometric properties of the original scale, making it suitable for assessing stress levels in diverse groups, including university students and clinical populations. The translation of scale into Turkish was done by Örücü et al. (2009) and Eskin et al. (2013). Authorization was granted by Eskin et al. (2013) via e-mail to use the test.

3.5.6. Yoga Self-Efficacy Scale

The Yoga Self-Efficacy Scale (YSES) is a contemporary tool designed to assess an individual's self-efficacy in maintaining a consistent yoga practice. The Yoga Self-Efficacy Scale (YSES) is a measure that assesses an individual's belief in their ability to perform yoga practices and achieve desired outcomes. It assesses an individual's confidence in their ability to perform various yoga postures and practices. The YSES consists of 13 items that were generated based on yoga and self-efficacy theory (Birdee et al., 2016). Body, breath, and mind were the three categories used to group the things on the scale. The original version of YSES is attached as Appendix I, and the ratings for each item ranged from strongly disagree to strongly agree on a 9-point Likert scale. The increase in the score obtained from the scale subscale scores indicates high yoga self-efficacy. The expert group and researchers refined the list to 12 self-efficacy items

with 5 Likert scale tailored to the Turkish population attached as Appendix H (Küçükelci, 2019). Cronbach's alpha value of the scale was found to be 0.93 in the original study (Birdee et al., 2016). Küçükelci (2019) researched a Turkish adaptation of the test, with high validity and reliability was conducted with a 0.89 Cronbach's alpha value. The permission to use the test was obtained from the author through e-mail.

3.5.7. Qualitative Data Collection Procedures

A convergent parallel design was chosen for this study as an approach that combines quantitative and qualitative data collection methods. Considering the literature, conceptual framework, and research variables, three field experts' feedback guided the qualitative research approach of the study, semi-structured interviews. The questions were designed to enable flexibility and in-depth exploration of the topics. This approach allowed the researcher the flexibility to modify the sequence of topics during the interview, ensuring a natural progression of the conversation.

Twelve questions were asked of the participants as part of the study, and the semi-structured questionnaire is included in Appendix C. The questions can be collected under the following main categories: Thoughts on yoga, The effects of yoga, Methodological approaches of the group, Self-efficacy regarding yoga, Suggestions and plans. The full list of questions provided in Appendix C is as follows:

1. What do you think about yoga?
2. How have your thoughts about yoga changed after participating in this study? (Both positive and negative changes)
3. How has participating in the yoga sessions affected your overall health condition?
4. What kind of physical changes have you experienced as a result of our yoga sessions? Could you describe these changes?
5. What kind of emotional changes have you experienced as a result of our yoga sessions? Could you describe these changes?
6. How did your stress levels change during and after the yoga intervention? Could you describe these changes?

7. You were part of the face-to-face or online group. What are your thoughts on in-person/online yoga training? (Things you liked, disliked, found difficult, or enjoyable, etc.)
8. How did you feel after the yoga sessions? (Also, please rate the physical/social/emotional aspects before and after the sessions.)
9. How did your knowledge or ability to do yoga change? (Please rate your experience before and after the sessions.)
10. If you were to join such a program again, what kind of adjustments or additions would you like to see? (In terms of duration, content, the instructor's teaching methods, etc.)
11. Do you plan to continue practicing yoga?
12. Is there anything else you would like to add?

A non-probabilistic, purposive sampling approach was used. The reason to use this sampling method is for suitability for small sample sizes, efficiency, and feasibility, focusing on in-depth understanding and giving a chance to select participants who possess specific characteristics, experiences, or expertise relevant to the study (Patton, 2015). 24 participants were selected from the 38-person intervention group. The selection criteria were their results in physical tests, their suitability, and the personal observations of the researcher during the intervention. Face-to-face (n=3), online (Via Zoom) (n=18), or telephone interviews (n=2) were conducted according to the suitability of the participants and they were informed that the interview was being recorded and their permission was obtained. The interviews lasted between 20-30 minutes. All participants provided consent for the use of their interview data. During the analysis, each of the 24 participants was referenced using anonymized identifiers (e.g., *P*1, *P*2), and no personal information was disclosed.

3.5.8. Adherence to Yoga Questionnaire (AYQ)

Adherence to an exercise program is essential after its initiation, as it significantly influences health outcomes, long-term success, and overall well-being. Notably, research indicates that approximately 50% of individuals who start an exercise

program discontinue within the first six to twelve months, failing to maintain consistent participation (Gjestvang et al., 2019; Schlicht et al, 1999).

To determine whether participants who took part in the yoga intervention continued practicing yoga or engaged in another form of physical activity, a four-question survey was administered approximately one year after the intervention began, in October 2024. The intervention had initially been started in October 2023. The questionnaire, created using Microsoft Office Forms, was distributed to the participants. The survey included questions regarding whether they practiced yoga and whether they had taken up a sport other than yoga. The questions are included in Appendix M.

3.6. Data Analysis

To address the research questions, both quantitative and qualitative data analysis methods were explained.

3.6.1. Quantitative Data Analysis

The quantitative aspect of the study has two main purposes. The first goal was to investigate if any significant difference existed among the groups (in-person, online, and control) in physical fitness parameters (strength, balance, flexibility, and body composition), perceived health, perceived stress, and yoga self-efficacy. The second was to investigate if any significant change in these variables occurred within each group from pre-test to post-test. The third goal was to examine whether there was a relationship between yoga adherence levels (i.e., not practicing, occasional practice, regular practice, etc.) and participation in in-person versus online yoga sessions during the one-year follow-up period.

Descriptive statistics (*n* and *p*) were used to summarize the demographic characteristics and main variables. Since the normality of the assumptions was not met because of the unedequate of sample size (N=57) and group size (n=19); non-parametric statistical approaches were applied for the quantitative data. For the first goal, the Kruskal-Wallis test was used. When significant differences were found in the

post-test, Dunn's post hoc test without Bonferroni correction was applied. Due to the small number of participants in each group (n=19), applying Bonferroni correction could lead to an overly conservative adjustment and increase the risk of Type II errors (failing to detect real differences) (Perneger, 1998). Consequently, raw (uncorrected) p-values (set at p<.05) are reported instead of Bonferroni-adjusted values. For the second aim; The Wilcoxon signed-rank test was run to understand a change within the group from pre-test to post-test. Unlike the other analyses presented above, the perceived health parameter was analyzed by conducting the chi-square test, as it is a categorical variable.

The level of significance was set at p<.05 for all quantitative analyses. For the significant values of continuous variables, Cohen's effect size (d); for categorical data, Cramér's V was calculated as a measure of effect size (Cohen, 1988; Sun et al.,2010).

For the research question of adherence, descriptive and simple-comparative data determined by frequency and percentage were calculated. Also, a Chi-square test of independence with Cramér's V was performed to examine the relationship between adherence and group differences.

The statistical analyses were conducted by using IBM SPSS Statistics (Version 28) and Excel, both of which were accessed through the institutional license provided by METU.

3.6.2. Qualitative Data Analysis

For the qualitative data, a thematic reflexive approach was used, as outlined by Braun and Clarke (2013), to analyze participants' responses to the open-ended survey questions. This approach involves identifying, analyzing, and interpreting patterns of meaning (themes) within the data. It emphasizes the active role of the researcher in the process of coding and theme development, recognizing that meaning is not simply discovered but co-constructed through the interaction between the researcher and the data.

A data-driven, inductive strategy was adopted, whereby codes and themes were developed directly from participants' own expressions rather than being imposed based on pre-existing frameworks. This allowed for a more open and flexible exploration of participants' experiences and perceptions. Thematic reflexive analysis was selected because it offers both structure and flexibility, making it suitable for exploring subjective experiences such as the perceived physical, psychological, and behavioral impacts of a yoga intervention. Moreover, it aligns closely with the study's qualitative goals, which aimed to gain in-depth insight into participants' personal reflections, behavioral changes, and motivations in both the in-person and online yoga contexts. All data were coded and organized using Microsoft Excel to facilitate systematic categorization and theme development

3.7. Threats to Internal Validity

Internal validity refers to the degree of certainty that the changes in the results were caused by the program or activity, rather than by some other factor (Fraenkel et al., 2012). In studies like this one, which employ a pre-test, post-test design with a control group, it is crucial to be aware of any factors that could influence the results. Based on this study, several possible threats to internal validity were identified and are shown in Table 3.8. It is also explained what steps are being taken to reduce the impact of potential threats.

Table 3.8. Internal Validity Threats Summary

Threat	***Why could be threat***	***How to minimize***
Subject Characteristics	Differences in age and life context may affect responses	Same inclusion criteria used; groups had similar pre-test scores; diversity considered in interviews
Location	Home vs. studio settings may influence comfort and focus	Treated as real-world variation; low threat

Table 3.8. (continued)

Instrumentation	Different tools or procedures could affect results	Same validated tools and protocols used in pre-and post-tests

Data Collector Characteristics	Evaluator traits could bias assessments	Same evaluator used; no influence of personal characteristics found
Data Collector Bias	The researcher collected & analyzed data	Standardized procedures, external expert oversight, and peer debriefing
Testing	Pre-test may influence post-test responses	Sufficient time between tests; same tools used
History	External events could impact outcomes	The control group included Short time between pre- and post-tests; no major events occurred
Attitude of Subjects	Participants may change behavior because they know they're being studied	General info provided only; no details on hypotheses, neutral item phrasing used

According to Fraenkel et al. (2012), internal validity refers to the degree to which observed results can be reliably attributed to the intervention rather than to outside influences. Differences in participant age and living circumstances could be a threat to subject characteristics. Though the groups had identical pre-test results at the start, the same selection criteria were applied, and in the interviews, we focused on demographic variation. This threat was thus lessened. Since the difference in place—studio vs. home—reflects real-life circumstances, it was not considered a drawback. The entire process followed accepted procedures, all tests were conducted using the same tools and techniques, by the same person. Blinding was not feasible; thus, engaging with an external expert helped to lower bias. Given enough time between exams to prevent practice effects, the short research duration meant that outside events had no threats on the outcomes. The Hawthorne effect was minimized (Fraenkel et al., 2012; McCarney et al., 2007), as participants were only provided with general information and were not informed of the precise research topics. Although some pre-test questions might have raised awareness, particularly among more educated individuals, the questions were carefully designed to be objective and unbiased. The actions taken ensured that risks to internal validity remained low to moderate and that the study's design and execution adequately addressed them.

3.8. Trustworthiness

Because qualitative data analysis is an interpretive process, this study adheres to the criteria of credibility, transferability, dependability, and confirmability to ensure the trustworthiness of the findings (Creswell, 2013; Glesne, 2016, Guba, 1981; Lincoln & Guba, 1985).

To strengthen credibility, the researcher consulted three field experts while preparing the semi-structured interview guide and revised it based on their suggestions. After the interviews were transcribed verbatim, the researcher checked the consistency between the transcripts and audio recordings. The content analysis was conducted manually using Excel. To minimize subjectivity and improve consistency, peer debriefing sessions were held with two colleagues during the coding process. Supported by external observations, helped enhance the reliability of data-driven interpretations.

To ensure transferability, participants were selected based on predetermined criteria. The selection was made by considering the differences between pre- and post-test results and supported by classroom observations. This approach was intended to guide future studies with similar groups. Themes and codes were created based on participants' statements. An inductive, bottom-up approach was used to move from data to theory.

To provide dependability, a systematic process of data collection and analysis was followed. The planning and implementation of interviews, coding decisions, and theme development were conducted in a clear and structured manner under the supervision of an external expert from the department. Although a formal audit trail was not prepared, the entire analysis process—from transcripts to coding—was explained. Coding reliability was supported by peer reviews conducted with two colleagues. In these sessions, similarities and differences between the codes, as well as ways to express the codes more clearly, were discussed. A consensus was reached to reduce subjectivity in interpretations and ensure consistency.

To ensure confirmability, themes and interpretations needed to be grounded directly in the data. For this reason, all interpretations made during the analysis were supported by participant statements. The original expressions of participants were preserved as much as possible. In this way, the researcher's subjectivity was minimized in the influence on the findings.

3.9. Researchers Role

In mixed-methods research, the researcher has several important roles, including collecting objective data and interpreting it reflectively. The researcher has to be actively involved in both the quantitative and qualitative parts of this investigation (Creswell, 2009)

I used to study urban planning, but I switched to sports sciences and physical education because I became more interested in yoga and other mind-body health practices. As a hatha yoga teacher with a 200-hour teacher training certificate, I attended a six-month Iyengar yoga program in Pune, India. I also have teaching experience in yoga abroad. This expertise in different fields and countries provided me with a strong foundation for planning and implementing a structured yoga intervention as part of scientific research study.

During the quantitative data analysis, I was responsible for leading an 8-week Hatha-based Iyengar yoga program for both in-person and online groups. I was the teacher for all groups, ensuring that the program content, quality of training, and delivery were consistent across all groups. I also managed the administration of pre- and post-test evaluations, which included physical fitness tests, reported stress levels, perceived health status, and yoga self-efficacy ratings. I employed non-parametric approaches, which were suitable for the sample, to conduct the statistical analysis. During this step, I ensured that my role as a teacher remained distinct from the assessment process and followed standard protocols to maintain objectivity.

In the qualitative data analysis, I conducted semi-structured interviews with 24 participants from the intervention group to learn about their personal experiences with yoga. We videotaped all the interviews with the participants' permission, transcribed

them verbatim, and then analyzed them using a reflective thematic method. I manually coded the data using Word and Excel, and generated themes through repeated review of the transcripts. To enhance transparency and trustworthiness, the coding and themes were further refined through peer review discussions. Because I was both a yoga teacher and a researcher, I stayed reflexive throughout the project. I was always aware of how my background, views, and position might affect the research process and my understanding of it. To avoid bias, I documented all my analytical choices and ensured that my conclusions were grounded in actual quotes from participants and verifiable facts.

In general, my job in this study was to mix controlled, quantitative measurements with open-ended, qualitative questions. Because I have a background in multiple fields and have practiced yoga myself, I was able to gain a comprehensive understanding of how in-person and online yoga courses impact young adult women and how they may be affected.

3.10. Limitations

A limitation of this study is the use of convenience sampling, meaning participants were selected based on their availability and willingness to participate. Although this method is common in applied research, it may limit the generalizability of the findings, as the sample may not fully represent the wider population. Additionally, participants were assigned to the in-person or online groups based on their residential conditions, not randomly. Those living in university dormitories were placed in the in-person group, since most dormitory rooms lacked the space and privacy necessary for online participation. Participants living at home or in shared apartments, where such limitations were less of a concern, were assigned to the online group. While this assignment was not random, it followed a logical and practical rationale that ensured feasibility and maximized participation. Although there is a possibility of selection bias, the group allocation was based on contextual realities and aimed at preserving the intervention's integrity and accessibility.

Another limitation is the sample size (*N*=57). Although sufficient for the primary analyses, a larger sample would have allowed greater statistical power and more sensitive subgroup comparisons. The fairly small sample could have limited the ability to detect small effects and could limit the external validity of the outcomes. More representative and larger samples should be recruited in future studies to ensure maximum robustness and external validity of the findings

The inability to control participants' dietary habits and their possibility of doing other physical activities besides the intervention is another limitation of the study. These variations in diet and additional exercise may have affected the main variables of the study: body composition, muscle strength, and stress levels. These factors were neither monitored nor standardized during the intervention period, although participants were explicitly instructed by the researcher—both verbally and through the consent form—to maintain their usual daily routines. Future studies should account for ways to assess and control such factors so as to increase the internal validity of the study and sincerely attribute changes to the intervention.

Maintaining participants' motivation throughout the intervention was a another limitation, as it could influence both adherence and outcomes. Nevertheless, the intervention was implemented successfully. Attendance rates were high, with 88.49% for the in-person group and 86.84% for the online group. Dropout rates were low across all groups: 0% in the control group, 5% in the in-person group, and 9.52% in the online group.

The dual role of the researcher as both yoga instructor and researcher contributed positively to the study by enabling consistent program delivery and ensuring deep subject-matter expertise. However, this dual role also introduced a risk of bias that could affect the objectivity of the research process. To address this, several strategies were used to maintain scientific rigor, including the use of objective measurement tools, transparent reporting procedures, and external expert and peer reviews.

CHAPTER 4

RESULTS

This chapter presents the study's findings in detail, including participants' demographics, non-parametric statistical analyses, and qualitative results. The quantitative results are organized according to the research questions and cover comparisons between and within groups for physical fitness parameters, perceived health, perceived stress, yoga self-efficacy, and adherence to yoga practice. Additionally, the qualitative findings obtained through open-ended responses are presented in the final section of the chapter.

4.1. Demographics of Participants

This section presents the socio-economic and demographic characteristics of the participants, along with their lifestyle habits. It also examines self-reported barriers to physical activity, categorized as personal, emotional-psychological, and environmental factors. Additionally, the section includes data on participants' self-confidence in changing their behavior and their experiences with in-person and online learning since the COVID-19 pandemic.

The questionnaires were administered to all three groups at the time of the pre-test via QR code using Microsoft Forms attached in Appendix D.

The participants (N=57) were asked to indicate which of the habits listed in Table 4.1 they engage in at least four times per week. The results are presented in the table below, highlighting the number of participants who reported behaviours were selected.

Table 4.1. Participant Habits Practiced Four or More Days Per Week

Habits	***Total***		***In-Person***		***Online***		***Control***	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Smartphone use	50	87.72	15	30	18	36	17	34
Sleep between 7-8 hours	48	84.21	16	33.33	16	33.33	16	33.33
Sugar consumption	40	70.18	15	37.50	12	30	13	32.5
Meat and dairy consumption	36	63.16	9	25	12	33.33	15	41.67
Vegetable consumption	36	63.16	7	19.44	14	38.89	13	36.11
Fruit consumption	30	54.39	12	38.71	10	32.26	9	29.03
Healthy breakfast	22	38.6	5	22.72	9	40.91	8	36.36
Smoke cigarette	11	19.30	5	45.46	2	18.18	4	36.36
Alcohol	2	3.51	-	-	2	100	-	-

When the daily habits of participants were observed, the most common among all groups was the use of smartphones at 87.72% (*n*=50), who used their phone four or more hours a day. The greatest number (*n*=18) was found from the online group, followed by the control (*n*=17) and in-person (*n*=15) groups. The sleep routines were evenly distributed—84.21% (*n*=48) of the overall participant sample reported sleeping 7–8 hours on a regular basis, with four from each group (*n*=16 per group). Use of sugar was also common, indicated by 70.18% (*n*=40) of the participants. The in-person had the highest regular users of sugar (*n*=15), followed by the control (*n*=13) and online (*n*=12). In meat and dairy eating, 63.16% (n=36) ate them regularly. Control group here (*n*=15), then online (*n*=12) and in-person (*n*=9). Vegetable consumption had a different distribution—again 63.16% (*n*=36) overall—but greater in the online group (*n*=14) than control (*n*=13) and in-person (*n*=7). Fruit consumption was slightly lower at 54.39% (*n*=30), with greater levels in the in-person group (*n*=12), then online (*n*=10) and control (*n*=9).

Breakfast behaviour was stated by 38.6% of the participants (*n*=22). It happened most frequently in the online group (*n*=9), less frequently in control (*n*=8), and least in the in-person group (*n*=5). Smoking cigarettes was stated by 11 participants (19.30%), with nearly half of them (*n*=5) belonging to the in-person group. Drinking alcohol was remarkably rare—only two participants, both belonging to the online group.

Overall, participants had moderate levels of healthy habits. Most of them slept well and ate some fruits and vegetables on a regular basis. But a lot of people used smartphones and ate a lot of sugar, and not many people ate breakfast on a regular basis. The online group tended to have slightly healthier habits, such eating more vegetables and having breakfast every day. The in-person group, on the other hand, had riskier behaviors, like smoking and eating a lot of sugar.

Understanding the barriers that prevent individuals from engaging in regular physical exercise is essential for designing effective interventions. At the pre-test, the participants were asked about the barriers under 3 headings: personal, emotional-psychological, and environmental. Table 4.2 below shows participants' **s**elf-reported personal barriers to engaging in physical activity, comparing the in-person, online, and control groups.

Table 4.2. Participants' Self-Reported Personal Barriers to Engaging in Physical Activity

Personal Barriers	***Total***		***In-Person***		***Online***		***Control***	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Lack of management such as setting personal goals, monitoring goals	40	70.18	13	32.5	15	37.5	12	30
Lack of time allocation	33	57.9	12	36.36	7	21.21	14	42.42
Feeling fatigued	34	59.65	10	29.41	13	38.24	11	32.35
Lack of a physically active role model	17	29.83	7	41.18	6	35.29	4	23.53
Economic constraints	14	24.56	6	42.86	5	35.71	3	21.43
Perception that exercising is ineffective	2	3.51	-	-	-	-	2	100

In this study, 57 students were asked about the factors that personal barriers of their participation in physical activity. Across all groups, the most common personal barrier mentioned was a lack of personal management skills (i.e., not setting goals or monitoring). It was mentioned by 40 participants (70.18%) and almost evenly distributed across groups, with most being reported by the online group (*n*=15, 37.5%), followed by the in-person group (*n*=13, 32.5%) and the control group (*n*=12, 30%). Feeling fatigue was comparatively consistent overall across groups, affecting 34

participants in total (59.65%). It was most frequently reported in the online group (*n*=13, 38.24%), then the control group (*n*=11, 32.35%), and the in-person group (*n*=10, 29.41%). Lack of time for physical egsersize was another barrier, mainly among the control group, where 14 members (42.4%) cited this challenge. It came second among the in-person group (*n*=12, 36.4%) and the online group (*n*=7, 21.21%). Physical inactivity role model was mentioned by 17 participants (29.83%) in all groups with the highest frequency in the in-person group (n=7, 41.18%), then in the online group (*n*=6, 35.29%) and finally in the control group (*n*=4, 23.53%). Financial limitations were another barrier, which was reported by 14 participants (24.56%). It was most commonly referenced by the in-person group (*n*=6, 42.86%) and the online group (*n*=5, 35.71%), followed by the control group (*n*=3, 21.43%). Finally, the perception that exercise does not work was an unusual barrier but identified in only the control group (*n*=2, 100%). As a result; the findings show that self-regulation skills, fatigue, and time constraints are the most common personal barriers to physical activity.

The participant (*N*=57) was asked another question to gain insight into the obstacles to engaging in physical activity. Emotional and psychological barriers to physical activity are cited in Table 4.3.

Table 4.3. Participants' Self-Reported Emotional and Psychological Barriers to Engaging in Physical Activity

Emotional and psychological barriers	***Total***		***In-Person***		***Online***		***Control***	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Lack of motivation	53	92.98	19	35.85	18	33.96	16	30.19
Lack of enjoyment	23	40.35	5	21.74	9	39.13	9	39.13
Lack of confidence	29	50.88	14	48.28	6	20.69	9	31.04
Concerns about physical appearance (e.g., shame, hesitation, etc.)	11	19.30	7	63.64	1	9.09	3	27.27
Fear of injury or physical harm	2	3.51	-	-	-	-	2	100

Among 57 participants revealed that the most frequently reported barrier to all of the groups was low motivation, expressed by 53 participants (92.98% of the total sample). This was fairly evenly distributed throughout the in-person group (*n*=19, 35.85%),

online group (*n*=18, 33.96%), and control group (*n*=16, 30.19%), indicating motivation was a widespread barrier regardless of groups. Lack of enjoyment of physical egersize felt by 23 subjects (40.35%) and was more dominant in the online and control groups, with 9 subjects in each group (39.13% in each group), while only 5 subjects in the in-person group (21.74%) felt this barrier. Lack of confidence in the ability to perform physical exercise were cited by 29 participants (50.88%), and were most significant in the in-person group (*n*=14, 48.28%). Next was the control (*n*=9, 31.04 %) and then the online group (*n*=6, 20.69%). Concerns about physical appearance (embarrassment, shyness, etc.) were noted by 11 respondents (19.30%) in total. Interestingly, this issue was far more dominant in the in-person group (*n*=7, 63.64% of those choose it), compared to the control group (*n*=3, 27.27%) and especially the online group (*n*=1, 9.09%). Lastly, fear of injury or harm by physical egersize was extremely rare, cited by only 2 participants (3.51%), both of them were in the control group. These findings indicate that motivation**,** confidence**,** and enjoyment are central emotional and psychological barriers to physical activity.

Another question regarding barriers to physical participation, as an environmental barrier, was analyzed, and the values are shown in Table 4.4.

Table 4.4. Participants' Self-Reported Environmental Barriers to Engaging in Physical Activity

Environmental Barriers	***Total***		***In-Person***		***Online***		***Control***	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Transportation (traffic, difficulty with public transportation)	25	43.86	7	28	7	28	11	44
Lack of social groups (at the workplace, on campus, among friends, etc.)	22	38.6	5	22.73	8	36.36	9	40.91
Safety concerns (darkness, stray dogs, fear of harassment)	20	35.09	9	45	5	25	6	30
Lack of sports centre and facilities	17	29.82	5	29.41	7	41.18	5	29.41
Table 4.4. (continued)								
Weather conditions (rain, heat, snow, humidity, etc.)	14	24.56	7	50	4	28.57	3	21.43

Insufficient infrastructure (lack of green spaces, absence of walking/cycling paths, etc.)	9	15.79	1	11.11	3	33.33	5	55.56
Lack of encouragement and support from family, friends, or a partner	7	12.28	1	14.29	2	28.57	4	57.14

Environmental challenges were fairly common across all groups, with transportation issues being the most often cited (*n*=25, 43.86%). This was highest in the control group (*n*=11, 44%), and was reported equally by both in-person and online groups (*n*=7 each, 28%). This absence of social groups such as friends or campus-based exercise groups was another problem mentioned most frequently (*n*=22, 38.6%), with the control group mentioning it most (*n*=9, 40.91%), followed by the online group (*n*=8, 36.36%), and the in-person group (*n*=5, 22.73%). Issues of safety (darkness, dogs, fear of harassment) were reported by 20 participants (35.09%). This was highest in the in-person group (*n*=9, 45%), while online participants (*n*=5, 25%) and control participants (*n*=6, 30%) reported these lower. Lack of sports facilities or centers was noted by 17 participants (29.82%), and the most complaining group about this issue was the online group (*n*=7, 41.18%), followed by both control and in-person groups equally (*n*=5 each, 29.41%). 14 of the participants (24.56%) reported weather conditions such as hot, cold, or rain, as a barrier for exercise with the in-person group reporting most frequently (*n*=7, 50%) than the online group (*n*=4, 28.57%) and the control group (*n*=3, 21.43%).

Poor infrastructure like the lack of green spaces or walking trails was less commonly cited (*n*=9, 15.79%), in the control group (*n*=5, 55.56%) and online group (*n*=3, 33.33%) and one in-person group (11.11%) mentioned this. Finally, the lowest reported environmental barrier was a lack of encouragement or support from family members or friends (*n*=7, 12.28%), this was most common in the control group (*n*=4, 57.14%). less common in the online group (*n*=2, 28.57%), and rarerly in the in-person group (*n*=1, 14.29%). As a conclusion; environmental barriers such as transportation, safety, and social support limitations significantly affect physical activity participation.

Another question, “How would you rate your self-confidence in making a behaviour change or developing a new behaviour?” was asked to participants to understand how confident they feel about making a change or starting a new habit, like doing yoga or sports. Confidence is important because it affects whether someone will try, keep going, or give up. This question also helps us see if people with higher confidence are more likely to stick with yoga. It gives useful information to support people who may need more help to feel confident. Participants were asked to rate their self-confidence on a scale from 1 to 10. For analysis purposes, responses were categorized as follows: scores of 9–10 were classified as very high self-confidence, 7–8 as high self-confidence, 5–6 as moderate, 3–4 as low, and 1–2 as very low self-confidence. As a result of the analysis, the result is given below in Table 4.5.

Table 4.5. Participants’ Self-Confidence Levels in Making a Behaviour Change or Developing a New Behaviour

Self-Confidence Levels	***Total***		***In-Person***		***Online***		***Control***	
	n	***P (%)***	***n***	***P (%)***	***n***	***P (%)***	***n***	***P (%)***
Very high self confidence	4	7.02	1	25	2	50	1	25
High self confidence	22	38.6	9	40.91	5	22.73	8	36.36
Moderate self confidence	18	31.58	3	16.67	9	50	6	33.33
Low self confidence	10	17.54	5	50	2	20	3	30
Very low self confidence	3	5.26	1	33.33	1	33.33	1	33.33

When comparing the three groups in terms of self-reported self-confidence levels in making a behavior change or developing a new habit, overall among all participants (*N*=57), the majority reported high (38.6%, *n*=22) or moderate (31.6%, *n*=18) levels. The in-person group had high percentages of high self-confidence were reported (40.9%, *n*=9), but also had the highest number of low self-confidence responses (50%, *n*=5). The online group showed more moderate (50%, *n*=9) and very high (50%, *n*=2) confidence. The control group was quite evenly distributed across categories, with a high (36.4%, *n*=8) and moderate (33.3%, *n*=6) levels of confidence. Very low self-confidence was uncommon (5.3%, *n*=3) and divided equally between the three groups. Lastly, participants were asked about their experiences with in-person and online learning for understanding how different teaching methods are perceived. These students had experienced online learning during the COVID-19 pandemic, as their

university, college, or workshop courses were delivered remotely at that time. Therefore, they had first-hand experience with both learning formats. Comparing these two experiences helps reveal which method participants find more engaging, effective, or comfortable, which can influence their motivation, participation, and long-term adherence. This also supports the evaluation of the intervention methods used in the study and provides practical insights for designing future programs that align with participant preferences and needs. Two questions were asked how their general education experiences with in-person and online education -during and after Covid-19. Participants were asked to rate their experiences on a scale from 1 to 10 (1 least like -10 most like). Answers categorized as most likely as a positive experience and least likely as a negative experience. Answers from 10-6 categorized as a positive experience; 5-1 as a negative experience. Table 4.6 below shows the results of the in-person experience and the online experience.

Table 4.6. In-Person and Online Education Experience Ratings of Participants

Education Experience/Groups	***In-Person***		***Online***	
	n	***P (%)***	***n***	***P (%)***
Positive experience	53	92.98	12	21.05
Negative experience	4	7.02	45	78.95

According to Table 4.6, out of 57 participants, 53 (92.98%) rated their in-person learning experience positively, while only 4 participants (7.02%) reported negatively. In contrast, only 12 participants (21.05%) reported a positive experience with online learning, whereas 45 participants (78.95%) rated it negatively. Overall majority of participants had a preference on in-person education.

4.2. Research Questions and Results

This section presents the findings of the study concerning the research questions, aiming to clarify the impact of the yoga programs on physical fitness, perceived stress, perceived health, self-efficacy, and adherence among young adult women. Each variable was examined through two separate research questions. Each research question was introduced with its related parameters, followed by the corresponding analyses and results.

4.2.1. Between-Group Differences Research Questions and Results

4.2.1.1. Research Question and Results Related to Strength

RQ-1 (a): Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group in ***strength*** after an 8-week hatha-based Iyengar yoga program?

Results of Strength: To assess group differences among the in-person yoga, online yoga, and control groups in strength performance, Kruskal–Wallis H tests were conducted for the Hand Grip Strength Test (HGST) and Sit-Up Test, measured both before and after the intervention (Table 4.7).

Table 4.7. Kruskal-Wallis H Test Results for Strength Tests Across Groups

Measurements		***In-Person***	***Online***	***Control***		
		Mean Rank	***Mean Rank***	***Mean Rank***	***H***	***p***
HGST	Pre	27.58	30.74	26.68	0.35	0.84
	Post	30.16	32.05	24.79	1.96	0.38
Sit-Up Test	Pre	27.37	30.18	29.45	0.30	0.86
	Post	32.08	30.39	24.53	2.19	0.34

HGST: Hand Grip Strength Test

According to the Kruskal-Wallis analysis of the pre-tests across HGST ($H(2) = 0.35$, $p=0.84$) and Sit-Up performance ($H(2)=0.30$, $p=0.86$) showed no statistically significant differences were found among the three groups at pre-test. This indicates that all groups started with comparable baseline levels of strength before the intervention.

To evaluate differences in post-intervention strength levels among the three groups (in-person yoga, online yoga, and control), Kruskal-Wallis H tests were conducted. The results indicated that there were no statistically significant group differences at post-test for HGST ($H(2)=1.96$, $p=0.38$) and for the sit-up test ($H(2)=2.19$, $p=0.34$). Since the p-values for both pre- and post-test comparisons are greater than $\alpha=0.05$, we fail to reject the null hypothesis, meaning there were no statistically significant

differences in hand grip strength and sit-up tests between the groups before or after the intervention. As none of the comparisons reached statistical significance, post hoc analyses were not conducted.

4.2.1.2. Research Question and Results Related to Balance

RQ-1 (b): Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group in ***balance*** after an 8-week hatha-based Iyengar yoga program?

Results of Balance: A Kruskal-Wallis H test was conducted to determine whether there were statistically significant differences among the three groups (in-person yoga, online yoga, and control) in single-leg balance based on four conditions:

- Dominant Leg Eyes Open (DLEO)
- Dominant Leg Eyes Closed (DLEC)
- Non-Dominant Leg Eyes Open (Non-DLEO)
- Non-Dominant Leg Eyes Closed (Non-DLEC)

Each condition was measured both before (pre-test) and after (post-test) the intervention to assess the impact of in-person and online yoga intervention on balance among the three groups (Table 4.8).

Table 4.8. Kruskal-Wallis H Test Results for Balance Across Groups

Balance Test	***In-Person***	***Online***	***Control***		
	Mean Rank	***Mean Rank***	***Mean Rank***	***H***	***p***
DLEO					
Pre	25.74	31	30,26	1,78	0.41
Post	29.18	34.58	23.24	7.78	0.02*

Table 4.8. (continued)

DLEC					
Pre	29,16	29.47	28.34	0.05	0.98
Post	32.82	29.21	24.97	2.31	0.35
Non_DLEO					

Pre	25.84	32.26	28.89	2.02	0.36
Post	27.11	34.53	25.37	5.20	0.07
Non_DLEC					
Pre	27.26	27.79	31.95	0.91	0.63
Post	27.00	33.66	26.34	2.27	0.32

DLEO: Dominant Leg Eyes Open, DLEC: Dominant Leg Eyes Closed, Non-DLEO: Non-Dominant Leg Eyes Open, Non-DLEC: Non-Dominant Leg Eyes Closed

To investigate differences in balance performance across the in-person yoga, online yoga, and control groups, Kruskal–Wallis H tests were conducted for four balance conditions: DLEO, DLEC, Non-DLEO, and Non-DLEC. Conditions of tests were assessed at both pre- and post-test. At pre-test, there were no statistically significant differences among the groups for any of the conditions (DLEO: $H(2)=1.78$, $p=.41$; DLEC: $H(2)=0.05$, $p=.98$; Non-DLEO: $H(2)=2.02$, $p=.36$; Non-DLEC: $H(2)=0.91$, $p=.63$), indicating that the groups began the study with comparable similar balance abilities.

At post-test, a statistically significant difference among groups was found for the DLEO condition, $H(2)=7.78$, $p=.02.<.05$. Mean ranks revealed that the online yoga group demonstrated better balance performance compared to the in-person group, while the control group had the lowest performance.

For all other post-test conditions—DLEC, Non-DLEO, and Non-DLEC—no statistically significant differences were observed (DLEC: $H(2)=2.31$, $p=.35$; Non-DLEO: $H(2)=5.20$, $p=.07$; Non-DLEC: $H(2)=2.27$, $p=.32$).

Given that only DLEO post-test results reached statistical significance, post-hoc analyses were conducted for DLEO, but not performed for the other three conditions. Post-hoc pairwise comparisons were conducted using Dunn's test without Bonferroni correction. Due to the small number of participants in each group ($n=19$), applying Bonferroni correction could lead to an overly conservative adjustment and increase the risk of Type II errors (failing to detect real differences) (Perneger, 1998). Consequently, raw (uncorrected) *p*-values are reported instead of Bonferroni-adjusted values. The pairwise result for the groups is shown in Table 4.9 below.

Table 4.9. Pairwise Comparison of Groups *among DLEO*

Groups	*p*	*d*
Control vs In-Person	0.14	
Control vs Online	0.005*	0.45
In-Person vs Online	0.185	

According to Table 4.9, post-hoc pairwise comparisons showed that the difference between the online yoga group and the control group was statistically significant**,** p=.005<.05. The effect size (d=0.45) is found to be a small effect by Cohen (1988) and a small effect by Hopkins et al. (2009).

However, the differences between the in-person and control groups (p=.14) and the in-person and online groups (p=.185) were not statistically significant. Therefore, the null hypothesis of the first research question for the balance is rejected.

4.2.1.3. Research Questions and Results Related to Flexibility

RQ-1 (c): Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group in ***flexibility*** after an 8-week hatha-based Iyengar yoga program?

Results of Flexibility: A Kruskal-Wallis H test was conducted to determine whether there was a significant difference in sit and reach test (SRT) and back scratch test (BST) results among the three groups (Table 4.10).

Table 4.10. Kruskal-Wallis H Test Results for Flexibility Tests Across Groups

Measurements/Groups	*In-Person*	*Online*	*Control*		
	Mean Rank	*Mean Rank*	*Mean Rank*	*H*	*p*
SRT					
Pre	31.95	26.5	28.55	1.04	0.59
Post	34.74	29.89	22.37	5.36	0.69
BST_Left					

Table 4.10. (continued)

Pre	29.58	24.5	32.92	2.49	0.29
Post	33.53	24.87	28.61	2.61	0.27
BST_Right					
Pre	27.5	27.66	31.84	0.84	0.66

Post	32.11	27.63	27.26	1.00	0.61

SRT: Sit-and-Reach Test, BST: Back Scratch Test

At pre-test, there were no statistically significant differences among the groups for any of the tests. For the SRT, the groups started at similar levels ($H(2)=1.04$, $p=.59$), The same result was seen in the Back Scratch Test: the left side showed no significant differences at pre-test ($H(2)=2.49$, $p=.29$), and the right side results also remained non-significant ($H(2)=0.84$ $p=.66$). Results indicating that the groups began the study with comparable similar flexibility abilities.

For the post-test for all test results were also non-significant. Sit and reach test ($H(2)=5.36$, $p=.69$), Back Scratch Test for the left side ($H(2)=2.61$, $p=.27$), and the right side ($H(2) =1.00$, $p=.61$) results show no significant. Since the p-values for both post-tests are greater than $p=0.05$, we fail to reject the null hypothesis, meaning there were no statistically significant differences in flexibility among the groups. Therefore pot-hoc test was not evaluated.

4.2.1.4. Research Question and Results Related to Body Composition

RQ-1 (d): Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group in ***body composition*** after an 8-week hatha-based Iyengar yoga program?

Results of Body Composition: A Kruskal-Wallis H test was conducted to determine whether there was a significant difference in body composition measurements (BMI and BFP) among the three groups before and after the intervention (Table 4.11).

According to Table 4.11, it was analysed whether there was a significant difference in body composition among the in-person yoga, online yoga, and control groups. Kruskal–Wallis H tests were conducted for BMI and BFP, measured both before and after the intervention.

Table 4.11. Kruskal-Wallis H Test Results for Body Composition Across Groups

Measurements/Groups	***In-Person***	***Online***	***Control***		
	Mean Rank	***Mean Rank***	***Mean Rank***	***H***	***p***
BMI					

Pre	33.11	24.32	29.58	2.7	0.26
Post	31.95	24.37	30.68	2.27	0.32
BFP					
Pre	30.03	26	30.97	0.96	0.62
Post	29.61	26.71	30.68	0.58	0.75

BMI: Body Mass Index; BFP: Body Fat Percentage

At pre-test, there were no statistically significant differences among the groups for any of the body composition tests, indicating that participants began the study with comparable baseline body compositions. For the BMI, the groups demonstrated similar BMI levels $H(2)=2.7$, $p=.26$). A similar pattern was observed in the body fat percentage, with no significant group differences ($H(2)=0.96$, $p=.62$). At post-test, results also showed no statistically significant group differences at either BMI ($H(2)=2.27$, $p=.32$) or for body fat percentage ($H(2)=0.58$, $p=.75$). Since there were no statistically significant differences detected, it was failed to reject the null hypothesis for body compositions therefore post hoc comparisons were not performed.

4.2.1.5. Research Question and Results Related to Perceived Health Status

RQ-2: Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group in ***perceived health status*** after an 8-week hatha-based Iyengar yoga program?

Results of Perceived Health Status: To assess significant differences among groups in perceived health status, participants' responses to a single-item perceived health scale were analysed through a chi-squared test. The original scale consisted of four categories: 1=Very Good; 2=Good; 3=Fair; 4=Poor.

To facilitate categorical analysis and meet minimum expected cell requirements for Chi-square testing, responses were recoded into two broader categories: Good health: "Very good" and "good" (1–2), and Fair/Poor health: "fair" and "poor" (3–4).
This recoding was applied consistently to both pre-test and post-test responses, and the results for both tests are shown in Table 4.12 below.

Table 4.12. Chi-square Test Results for Perceived Health Status (Pre-and Post-Test)

Test Results	*Pre-Test*	*Post-Test*
Chi-Square (χ^2)	0.671	6.624
df	2	2
p-value	0.715	0.036*
Cramer's *V*	-	0.34

The results indicated that there is no significant difference in perceived health status among the in-person yoga, online yoga, and control groups before the intervention, $\chi^2(2, N=57) = 0.67$, $p=.715$. This suggests that the groups were statistically similar in terms of perceived health at the start of the study, supporting the assumption of group comparability at baseline.

A Chi-square test of independence was conducted to determine whether the three groups differed significantly in their perceived health status after the intervention. A significant association was found between group and post-test perceived health status, $\chi^2(2, N=57)=6.62$, $p=.036$, Cramér's $V=.34$. Based on Cohen's (1988) guidelines, as cited in Sun et al. (2010), a Cramér's V effect size had a medium effect size. Distribution of perceived health status at post-test by group is shown in Table 4.13.

Table 4.13. Distribution of Perceived Health Status at Post-Test by Group

Health Status	*In-person Yoga (n=19)*		*Online Yoga (n=19)*		*Control (n=19)*
	n	*p (%)*	*n*	*p(%)*	*n*
Good	14	73.7	15	78.9	8
Fair/Poor	5	26.3	4	21.1	11

According to Table 4.13, participants in the in-person and online yoga groups reported better perceived health after the intervention than those in the control group. The online group had slightly better reporting of good health (78.9%) than the in-person group (73.7%). This shows that both groups were effective, with the online group performing slightly better perceived health results.

4.2.1.6. Research Question and Results Related to Perceived Stress

RQ-3: Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group on ***perceived stress*** after an 8-week hatha-based Iyengar yoga program?

Results of Perceived Stress: A Kruskal-Wallis H test was conducted to evaluate whether there were statistically significant differences in perceived stress levels among the three groups (in-person yoga, online yoga, and control) before and after the intervention. The results are summarized below (Table 4.14).

Table 4.14. Kruskal-Wallis H Test Results of Perceived Stress Across Groups

Results/Groups	***In-Person***	***Online***	***Control***		
	Mean Rank	***Mean Rank***	***Mean Rank***	***H***	***p***
Stress					
Pre	33.53	25.29	28.18	2.42	0.30
Post	25.08	21.26	37.78	10.31	0.006*

The pre-test analysis revealed there were no statistically significant differences among the groups, $H(2)=2.42$, $p=.30$, indicating that all participants in the three groups began the study with comparable levels of perceived stress. However, a significant difference was observed in the post-test scores, $H(2)=10.31$, $p=.006<.05$. The control group had the highest mean rank (37.78), followed by the in-person yoga group (25.08) and the online yoga group (21.26), suggesting that participants in intervention group (in-person and online) experienced lower levels of perceived stress compared to the control group after the intervention.

Since the Kruskal-Wallis test for post-test of perceived stress was significant, a post-hoc analysis needed to be run to determine which group comparisons show the difference. To analyse that, a Dunn's post-hoc test was performed without Bonferroni correction due to the small sample size ($N=57$, $n=19$ per group). Bonferroni correction is highly conservative and may increase the risk of Type II errors, leading to false negatives in small samples (Perneger, 1998). Therefore, the raw p-values ($p=.05$) were used for interpretation. Pairwise results for the groups are shown in Table 4.15.

Table 4.15. Pairwise Comparison of Groups

Groups	***p***	***d***
In-Person vs Control	*0.02**	*-0.32*
Online vs Control	*0.002**	*-0.41*
In-Person vs Online	*0.45*	

The post hoc test results showed in Table 4.15 that there was a statistically significant difference observed (p=.02) between the in-person and the control group. The effect size (d=-0.32) was found to be a small effect by both Cohen (1988) and Hopkins et al. (2009). The results suggest that the in-person yoga group reported significantly lower stress levels than the control group. Another statistically significant difference was also found (p=.002) between the online and the control group. The effect size *(d*=-0.41) was found to be a moderate to large effect according to Cohen's Guidelines (Cohen, 1988) and a small effect according to Hopkins et al. (2009).

The results demonstrated that both the online and in-person yoga groups experienced significantly lower levels of perceived stress compared to the control group following the intervention. Notably, the reduction in perceived stress was greater in the online group than in the in-person group when each was compared to the control. However, no statistically significant difference was observed between the online and in-person groups themselves (p=.45). Results imply that both yoga interventions were similarly effective in reducing perceived stress. Since one of the groups had a significant change in perceived stress, the null hypothesis was rejected.

4.2.1.7. Research Question and Results Related to Yoga Self-Efficacy

RQ-4: Is there a significant ***difference*** among the intervention group (in-person and online yoga group) and the control group regarding ***yoga self-efficacy*** after an 8-week hatha-based Iyengar yoga program?

Results of Yoga Self-Efficacy: The Yoga Self-Efficacy Scale consists of three subscales: body, breath, and mind. Accordingly, the following analysis will be conducted based on these subdimensions, as well as the overall (total) score representing general yoga self-efficacy.

A Kruskal-Wallis H test was conducted to evaluate whether there were statistically significant differences in yoga self-efficacy among the three groups (in-person, online, and control). The results are summarized below (Table 4.16).

Table 4.16. Kruskal-Wallis Test Results for Yoga Self-Efficacy Subscale

Measurements/Groups	*In-Person*	*Online*	*Control*		
	Mean Rank	*Mean Rank*	*Mean Rank*	*H*	*p*
Body					
Pre	28.18	33.95	24.87	2.94	0.23
Post	35.16	33.74	18.11	12.46	0.002*
Breath					
Pre	30.16	27.26	29.58	0.33	0.85
Post	37.37	32.16	17.47	15.00	0.001*
Mind					
Pre	31.18	30.76	25.05	1.68	0.43
Post	34.71	33.66	18.63	11.43	0.003*
Total					
Pre	29.03	32.11	25.87	1.35	0.51
Post	37.95	33.03	16.03	18.30	0.001*

According to the Kruskal-Wallis analysis of the pre-tests across the four self-efficacy dimensions; Body_Pre ($H(2)=2.94$, $p=.23$), Breath_Pre ($H(2)=0.33$, $p=.85$), Mind_Pre ($H(2)=1.68$, $p=.43$), and Total_Pre ($H(2)=1.35$, $p=.51$) showed no statistically significant differences were found among the three groups at pre-test. This indicates that all groups started with comparable baseline levels of yoga self-efficacy before the intervention.

To evaluate differences in post-intervention yoga self-efficacy among the three groups (in-person yoga, online yoga, and control), Kruskal-Wallis H tests were conducted on the four subscales. The results indicated statistically significant differences across all dimensions. Specifically, the results were as follows: Body_Post ($H(2)=12.46$, p=.002), Breath_Post ($H(2)=15.01$, $p=.001$), Mi nd_Post ($H(2)=11.43$, $p=.003$), and Total_Post ($H(2)=18.30$, $p=.001$). The results indicate that at least one group in each subscale of yoga self-efficacy differed from the others significantly after the intervention. As *p*-values for all cases were less than $\alpha=0.05$, the null hypotheses were rejected for each of the subscales, indicating that the intervention had a significant impact on yoga self-efficacy.

Since the Kruskal-Wallis test for post-test yoga self-efficacy was significant, a post-hoc analysis was needed to determine which group comparisons showed the difference. To address this, a Dunn's post-hoc test was conducted without applying the Bonferroni correction, because of the relatively small sample size ($N=57$, $n=19$ per group). Since the Bonferroni adjustment is known to be overly conservative, especially

in small samples, it can increase the likelihood of Type II errors, leading to false negatives in small samples (Perneger, 1998). For this reason, raw *p*-values (with a significance level of p=0.05) were used in the interpretation of the results.

A Dunn's post-hoc tests were performed on the post-test scores of the four yoga self-efficacy subscales: body, breath, mind, and total self-efficacy of yoga. Pairwise comparison of the group differences with *p* and *r* values is shown in Table 4.17.

Table 4.17. The Pairwise Comparison of Groups Under Dimensions of Yoga Self-Efficacy

Results/Groups	***In-Person vs Control***		***Online vs Control***		***In-Person vs Online***
	p	***d***	***p***	***d***	***p***
Body					
Post	0.001*	0.67	0.004*	0.64	0.79
Breath					
Post	<0.001*	0.72	0.006*	0.62	0.33
Mind					
Post	0.003*	0.65	0.005*	0.63	0.84
Total					
Post	<0.001*	0.76	0.002*	0.67	0.36

Pairwise comparisons of post-test yoga self-efficacy scores (Table 4.17) revealed there was a statistically significant difference found between both the in-person and online yoga groups compared to the control group across all self-efficacy dimensions. The in-person group, specifically, reported significantly higher self-efficacy than the control group in body (p=.001), breath (p<.001), mind (p=.003), and total self-efficacy (p<.001), while the online group also demonstrated significantly higher scores in body (p=.004), breath (p=.006), mind (p=.005), and total self-efficacy (p=.002). Although no statistically significant differences were observed between the in-person and online groups across any of the subscales (p>.05), effect size values indicated that the in-person group exhibited higher improvements in body (d=.67 vs. .64), breath (d=.72 vs. .62), and total self-efficacy (d=.76 vs. .67) compared to the online group. For the mind subscale, the effect sizes are slightly higher (in-person d=.65; online d=.63), indicating comparable outcomes. According to Cohen's (1988) guidelines, both the online and in-person yoga programs demonstrated medium to large effect sizes. Similarly, based on the classification proposed by Hopkins et al. (2009), the observed effects can be

interpreted as moderate**.** These findings demonstrate that intervention formats were effective in enhancing yoga self-efficacy; however, the in-person format was associated with relatively greater gains in all sub-scales.

These findings demonstrate that at least one group differed significantly from the others in each of the yoga self-efficacy dimensions following the intervention. Given that *p*-values were below the α=0.05 significance, the null hypotheses were rejected.

4.2.2. Within-Group Changes Research Questions and Results

4.2.2.1. Research Question and Results Related to Strength

RQ-5 (a): Is there a statistically significant ***change*** in ***strength*** within each intervention group (in-person and online yoga group) and control group from pre-test to post-test?

Results of Strength: The Wilcoxon Signed-Rank test was conducted to examine whether there was a statistically significant change in hand grip strength and sit-up test from pre-test to post-test within each of the three groups. Table 4.18 presents the results of the changes in the HGST and Sit-Up tests.

Table 4.18. Comparison of Strength Test Results Across Groups

Strength Test	***In-Person***	***Online***	***Control***
Pre-to-Post HGST			
Negative Ranks	4	2	8
Positive Ranks	15	17	11
Ties	0	0	0
Z	-2.96	-3.02	-1.21
Table 4.18. (continued)			
p	0.003*	0.003*	0.23
r	−0.68	−0.69	
Pre-to-Post Sit-Up			
Negative Ranks	3	1	5
Positive Ranks	15	17	12
Ties	1	1	2
Z	-3.12	-3.60	-2.12

p	0.002*	<0.001*	0.34
r	−0.74	−0.85	

HGST: Hand Grip Strength Test

To evaluate changes in strength within each group from pre- to post-test, Wilcoxon Signed-Rank tests were conducted by the Hand Grip Strength Test and the Sit-Up Test. For HGST, statistically significant improvements were found in both the in-person yoga group (Z=-2.96, p=.003, r=0.68) and the online yoga group (Z=-3.02, p=.003, r=0.69), with the number of positive ranks substantially exceeding negative ranks in both cases. Moreover, results indicate large effect sizes (Cohen, 1988). No significant change was observed in the control group (Z=-1.21, p=.23). Similarly, for the Sit-Up Test, significant improvements were observed in the in-person group (Z=-3.12, p=.002, r=0.74) and the online group (Z=-3.60, p=<0.001, r=0.85), again with more positive ranks than negative ranks, indicating overall increases in performance. According to Cohen (1988), both results reflect large effect sizes; according to Hopkins et al. (2009) results reflect a medium effect size. The control group did not show a statistically significant change (Z=-2.12, p=0.34). Since the p-value of the HGST test for the in-person and online group, as well as the sit-up test for the in-person and online group greater than α=0.05, the null hypothesis is rejected.

4.2.2.2. Research Question and Results Related to Balance

RQ-5 (b): Is there a statistically significant ***change*** in ***balance*** within each intervention group (in-person and online yoga group) and control group from pre-test to post-test?

Results of Balance: The Wilcoxon Signed-Rank test was conducted to determine whether there were statistically significant changes in the single-leg balance test from pre-test to post-test within each of the three groups (in-person yoga, online yoga, and control). Table 4.19 shows the results of the within-group comparisons for the balance test under four conditions.

Table 4.19. Comparison of Balance Test Results Across Groups

Balance Test/Groups	***In-Person***	***Online***	***Control***
Pre-to-Post DLEO			
Negative Ranks	3	1	8
Positive Ranks	7	3	1
Ties	9	15	10
Z	-1.99	-1.1	-2.55
p	0.46	0.27	0.01*
r			-0.85
Pre-to_Post DLEC			
Negative Ranks	5	6	7
Positive Ranks	13	12	12
Ties	1	1	0
Z	-2.09	-1.18	-1.09
p	*0.04	0.24	0.28
r	-0.49		
Pre-to_Post Non_DLEO			
Negative Ranks	4	1	7
Positive Ranks	7	5	3
Ties	8	13	9
Z	-0.49	-1.68	-0.82
p	0.63	0.09	0.42
r			
Pre-to_Post_Non_DLEC			
Negative Ranks	8	6	11
Positive Ranks	9	13	7
Ties	2	9	1
Z	-1.04	-2.16	-0.76
p	0.30	0.03*	0.45
r		−0.50	

DLEO: Dominant Leg Eyes Open, DLEC: Dominant Leg Eyes Closed, Non-DLEO: Non-Dominant Leg Eyes Open, Non-DLEC: Non-Dominant Leg Eyes Closed

To evaluate within-group changes in balance performance from pre-test to post-test, Wilcoxon Signed-Rank tests were conducted separately for the in-person, online, and control groups across four balance conditions. For the DLEO condition, a significant change was observed in the control group in a negative way, Z=-2.55, p=.01, with a large negative effect size (r=0.85) (Cohen, 1988) and moderate negative effect size by Hopkins et al. (2009). Meaning that not having a yoga made a deteriorating balance on the dominant leg while the eyes were open. There were no statistically significant changes found in the in-person (Z=-1.99, p=.46) and online (Z=-1.10, p=.27) groups.

In the DLEC condition, the in-person group showed a statistically significant improvement in balance, Z=-2.09, p=.04, with a small to medium effect size (d=0.49) (Cohen, 1988), small effect size by Hopkins et al. (2009). Whereas no significant changes were observed in the online (Z=-1.18, p=.24) and control (Z=-1.09, p=.28) groups. For the Non-DLEO condition, no significant differences were detected in any group.

Lastly, in the Non_DLEC condition, a significant improvement was found in the online group, Z=-2.16, p=.03, corresponding to a large effect size (r=0.50) by Cohen (1988) but a small effect size by Hopkins et al. (2009). In contrast, the results in the in-person (Z=-1.04, p=.30) and control (Z=-0.76, p=.45) groups were not significant.

4.2.2.3. Research Question and Results Related to Flexibility

RQ-5 (c): Is there a statistically significant ***change*** in ***flexibility*** within each intervention group (in-person and online yoga group) and control group from pre-test to post-test?

Results of Flexibility: The Wilcoxon Signed-Rank test was conducted to examine whether there was a statistically significant change in flexibility measurements from pre-test to post-test within each of the three groups. Table 4.20 presents the results of changes in flexibility test measurements.

Table 4.20. Comparison of Flexibility Tests Results Across Groups

Results/Groups	***In-Person***	***Online***	***Control***
Pre-to-Post SRT			
Negative Ranks	2	0	14

Table 4.20. (continued)

Positive Ranks	17	19	5
Ties	0	0	0
Z	-3.56	-3.82	-1.81
p	0.001*	0.001*	0.07
r	0.82	0.88	
Pre-to-Post BST_Left			

Negative Ranks	1	3	8
Positive Ranks	18	14	10
Ties	0	2	1
Z	-3.79	-2.21	-0.76
p	0.001*	0.03*	0.45
r	0.87	0.51	
Pre-to-Post BST_Right			
Negative Ranks	1	2	11
Positive Ranks	17	16	5
Ties	1	1	3
Z	3.70	-2.36	-0.62
p	0.001*	0.02*	0.53
r	0.85	0.54	

SRT: Sit-and-Reach Test, BST: Back Scratch Test

A Wilcoxon Signed-Rank test was conducted to examine whether there was a statistically significant change in flexibility within each group from pre-test to post-test, using the Sit-and-Reach Test (SRT) and the Back-Scratch Test for both left and right arms.

In the SRT, both the in-person and online yoga groups demonstrated statistically significant improvements (Z=-3.56, p=.001, r=0.82; Z=-3.82, p=.001, r=0.88, respectively), with flexibility increases observed in nearly all participants and minimal signs of decline observed. According to Cohen (1988), both indicate a large effect size and a small effect size for Hopkins et al. (2009). In contrast, the control group did not show a statistically significant change (Z=-1.81, p=.07), and decreases in flexibility were observed more.

For the BST on the left side, significant improvements were again found in both the in-person group (Z=-3.79, p=.001, r=0.87) and the online group (Z=-2.21, p=.03, r=0.51). Results for the in-person group indicated a large effect size, and for the online group indicated a medium effect size (Cohen,1988). According to Hopkins et al. (2009) both groups indicated moderate effect size. In both groups, the number of participants who improved was higher than those who declined. The control group, however, showed no significant change (Z=-0.76, p=.45), with slight rank fluctuations in both directions.

A similar pattern was seen in the BST in right side, where the in-person group exhibited a significant improvement (Z=-3.70, p=.001, d=0.85) with large effect size, and the online group also showed a significant increase in flexibility (Z=-2.36, p=.02, d=.54) with medium effect size (Cohen, 1988). The control group, however, did not demonstrate any statistically significant change (Z=-0.62, p=0.53).

Since a significant change was observed in the flexibility results, we reject the null hypothesis.

4.2.2.4. Research Question and Results Related to Body Composition

RQ-5 (d): Is there a statistically significant ***change*** in ***body composition*** within each intervention group (in-person and online yoga group) and control group from pre-test to post-test?

Results of Body Composition: For the second research question, the Wilcoxon Signed-Rank test was used to analyse whether there was a significant change in BMI and body fat percentage from pre-test to post-test within all three groups. Table 4.21 shows the change in BMI and body fat percentages.

Table 4.21. Comparison of Body Composition Across Groups

Results/Groups	***In-Person***	***Online***	***Control***
Pre_to_Post_ BMI			
Negative Ranks	5	2	2
Positive Ranks	14	17	17
Ties	0	0	
Table 4.21. (continued)			
Z	-2.62	-3.66	-3.14
p	0.009*	0.001*	0.002*
r	0.60	0.84	0.72
Pre_to_Post_ FAT			
Negative Ranks	2	3	5
Positive Ranks	17	15	13
Ties	0	1	1
Z	-2.46	-3.09	-2.16

p	0.014*	0.002*	0.031*
r	0.56	0.71	0.50

BMI: Body Mass Index; BFP: Body Fat Percentage

According to Table 4.17, for BMI, statistically significant increased change was observed in the in-person group (Z=-2.62, p=0.009, r=.60), online group (Z=-3.66, p=0.001, r= .84), and control group (Z=-3.14, p=0.002, r=.72) with indicating a large effect size for all (Cohen,1988), moderate effect size for Hopkins et al. (2009). Across all groups, positive ranks (indicating an increase in BMI) outnumbered negative ranks, suggesting a consistent increase in BMI during the intervention period, even in the control group.

For body fat percentage, all three groups also demonstrated statistically significant changes in gaining fat. The in-person group showed a significant change gain (Z=-2.46, p=0.014, r=.56), as did the online group (Z=-3.09, p=0.002, r=.71), and the control group (Z=-2.16, p=.031, r=0.50). In each group, positive ranks outweighed negative ranks, indicating that most participants experienced an increase in body fat following the intervention period. According to Cohen's (1988) rules of thumb, all three groups demonstrated large effect sizes for the increase in body fat percentage, with the online group approaching a large effect size. According to Hopkins et al. (2009), the in-person and control groups indicated a small effect size, the online group showed a moderate effect size.

According to Table 4.21, in all three groups (in-person, online, and control), a gain change was observed in BMI and body fat percentage from pre-test to post-test. Since the p-values are all below α=.05, indicating that the observed changes in body composition results were statistically significant in all groups, therefore it was rejected the null hypothesis.

4.2.2.5. Research Question and Results Related to Perceived Health Status

RQ-6:-Is there a significant **change** in the distribution of **perceived health status (improved, stable, worsened)** from pre-test to post-test within each group?

Results of Perceived Health Status

This research question addresses whether the direction of change in perceived health differed significantly among the three groups from pre-test to post-test; a Chi-square test of independence was conducted. The difference between post-test and pre-test perceived health scores was categorized into three groups: Positive change (improvement)=1; No change (stable)=0; Negative change (worsening)=-1
Table 4.22 presents the results of a chi-square test.

Table 4.22. Chi-Square Results for Perceived Health Change

Test	Pre-to-Post Change
χ^2	5.23
df	4
p	0.27

A chi-square test of independence was conducted and Table 4.22 revealed that there is not statistically significant change between groups from pre-to-post test (χ^2 (4, *N*=57) =5.23, *p*=.27), indicating that the distribution of perceived health change (improved, stable, worsened) did not differ significantly across the three groups from pre to post test. It failed to reject the null hypothesis.

4.2.2.6. Research Question and Results Related to Perceived Stress

RQ-7: Is there a statistically significant ***change*** in ***perceived stress*** within each intervention group (in-person and online yoga group) and control group from pre-test to post-test?

Results of Perceived Stress: A Wilcoxon Signed-Rank test was conducted to assess whether a within-group change occurred in perceived stress levels from pre-test to post-test. The results are presented in Table 4.23.

Table 4.23. Comparison of Perceived Stress Results Across Groups

Results/Groups	In-Person	Online	Control
Pre_to_Post STRESS			
Negative Ranks	4	5	11
Positive Ranks	14	13	7
Ties	1	1	1
Z	-2.77	-2.38	-1.46

p	0.006*	0.02*	0.14
r	0.64	0.55	

The results of the Wilcoxon Signed-Rank Test showed that the in-person yoga (*Z*=-2.77, *p*=.006, *d*=.64) and online yoga (*Z*=-2.38, *p*=.02, *d*=.55) groups showed a statistically significant decrease in perceived stress levels from pre-tests to post-tests. Effect sizes were calculated, and both in-person yoga (*d*=0.64) and online yoga (*d*=0.55) showed a large effect size in the reduction of perceived stress (Cohen, 1988). According to Hopkins et al. (2009), in-person yoga showed a moderate effect size, and online group indicated a small effect size in the reduction of perceived stress. red However, the control group did not show a statistically significant change in stress levels (*Z*=-1.46, *p*=.14), indicating that perceived stress remained stable without an intervention.

The positive mean ranks for the intervention group reflect greater reductions in the stress levels. This suggests that both in-person and online yoga groups were effective in reducing perceived stress, whereas the control group either showed minimal improvement or possibly even increased stress levels. Therefore, it was rejected the null hypothesis.

4.2.2.7. Research Question and Results Related to Yoga Self-Efficacy

RQ-8: Is there a statistically significant ***change*** in ***yoga self-efficacy*** within each intervention group (in-person and online yoga group) and control group from pre-test to post-test?

Results of Yoga Self-Efficacy: A Wilcoxon Signed-Rank tests were then conducted to examine whether there was significant change within each group from pre-test to post-test in yoga self-efficacy (Table 4.24).

Table 4.24. Comparison of Yoga Self-Efficacy Results Across Groups

Results/Groups	***In-Person (n=19)***	***Online (n=19)***	***Control (n=19)***
Pre_to_Post BODY			
Negative Ranks	4	4	10
Positive Ranks	13	11	7
Ties	2	4	2

Z	-2.14	-1.95	-1.215
p	0.033*	0.051	0.22
r	0.49	-	-
Pre_to_Post BREATH			
Negative Ranks	5	3	14
Positive Ranks	12	10	4
Ties	2	6	1
Z	-1.86	-2.002	-2.145
p	0.06	0.045*	0.032*
r		0.46	0.49
Pre_to_Post MIND			
Negative Ranks	3	4	10
Positive Ranks	11	9	4
Ties	5	6	5
Z	-1.78	-1.309	-1.264
p	0.07	0.19	0.21
r	-	-	-
Pre_to_Post TOTAL			
Negative Ranks	4	3	11
Positive Ranks	15	14	7
Ties	0	2	1
Z	-2.48	-2.35	-1.94
p	0.013*	0.019*	0.052
r	0.57	0.54	-

For the Body, the in-person group demonstrated a statistically significant change (*Z*=-2.14, *p*=.033, *r*=0.49), indicating a medium effect size (Cohen, 1988), and small effect size for Hopkins et al. (2009). Result shows that more participants reported increased self-efficacy in their body than a decline in the in-person group. The online group showed a similar trend. However, no statistical significance change was found (*Z*=-1.95, *p*=.051). The control group did not show a significant change (*Z* =-1.21, *p*=.224).

For the Breath subscale of yoga self-efficacy across groups, statistically significant change in improvement was observed in the online group (*Z*=-2.00, *p*=.045, *r*=0.46), with more participants reporting gains in breath-related self-efficacy than declines. Similarly, the control group also showed a statistically significant change (*Z*=-2.15, *p*=.032, *r*=0.50), although the direction of ranks was deteriorating. The in-person group did not show a statistically significant change (*Z*=-1.86, *p*=.06). A Medium effect size was found according to Cohen (1988), small effect size was found according to Hopkins et al. (2009) in the online group. In the control group, a large

affect size was found in deteriorating breath for Cohen (1988) but a small effect size for Hopkins et al. (2009).

For the Mind subscale of yoga self-efficacy from pre- to post-test, none of the groups showed statistically significant changes. The in-person group (Z=-1.78, p=.07), the online group (Z=-1.31, p =.191), and the control group (Z=-1.26, p=.206) did not show significant changes, with positive and negative ranks more evenly distributed.

Analysis of the total self-efficacy score revealed statistically significant changes in intervention groups. The in-person group (Z=-2.48, p=.013, d =0.57) and the online group also demonstrated a significant gain (Z=-2.35, p=.019, r=0.54) with a large effect size (Cohen, 1988). In both groups, the majority of participants reported increased total yoga self-efficacy. The control group did not reach statistical significance (p=.052). The hypothesis was rejected for the second research question of yoga self-efficacy.

The Descriptive Summary of Within-Group Pre-Post Changes in Appendix N details the pre- and post-intervention differences in physical fitness, body composition, perceived stress, perceived health, and yoga self-efficacy across the three groups: in-person yoga, online yoga, and control.

The attached Appendix N displays mean differences with standard deviations and the corresponding percentage changes, providing a detailed overview of the size and direction of changes observed within each group. Related to that, Figure 4.1 illustrates the changes in physical fitness parameters and body composition measures within group changes with estimated standard deviations.

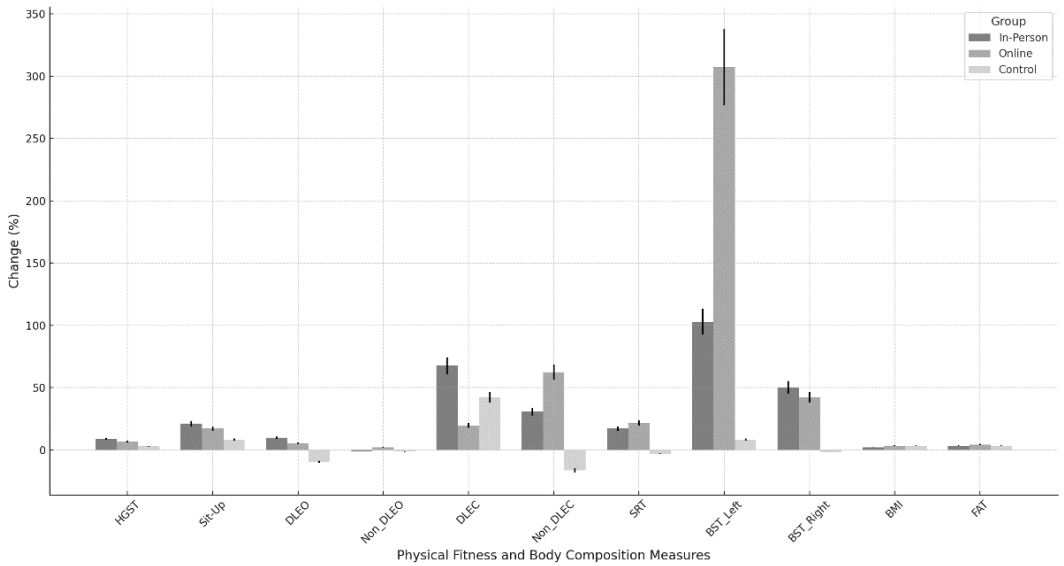


Figure 4.1. Within Group Percentage Change with Estimated Standard Deviations (Across Physical Fitness Parameters and Body Composition)

Figure 4.2 also presents group-level comparisons in perceived stress, perceived health, and yoga self-efficacy (body, breath, mind, total), based on percentage change from pre- to post-intervention, with estimated standard deviations for each group.

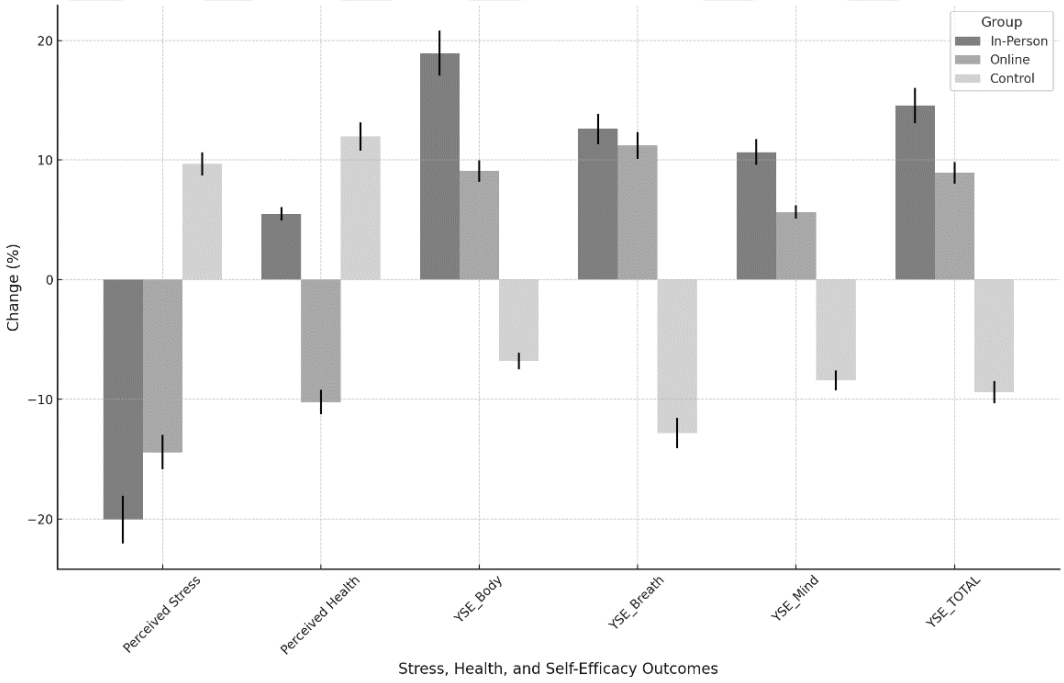


Figure 4.2. Within Group Percentage Change with Estimated Standard Deviations (Across Perceived Stress, Perceived Health, and Yoga Self-Efficacy)

A summary of the overall quantitative results addressing the two main research questions is provided in Appendix O as Overall Results of Quantitative Data. The results of statistical analyses—including the Kruskal-Wallis test, Dunn's post-hoc comparisons, Wilcoxon Signed-Rank tests, and the Chi-Square Test of Independence, which correspond to both between-group changes and within-group differences- are collectively presented in Appendix O.

4.2.3. Qualitative Study Research Question and Results

RQ-9: How do young adult women participants perceive and experience the effects of in-person and online yoga practices on their physical fitness, perceived health, perceived stress, and yoga self-efficacy?

Results of Qualitative Study: Semi-structured interviews were conducted within five days of post-test measurement with 24 people. Twelve interviewees were from the in-person group, and twelve were from the online group. Participants for the interviews were selected using purposive sampling. The selection was based on the instructor's classroom observations and participants' physical fitness test results. Those who showed significant improvement or decline in physical performance were prioritized. In total, 24 women participants from in-person and online groups were interviewed. For analyzing the yoga intervention, an interview questionnaire was developed using a thematic framework (see Appendix C). Interviews were conducted online (via Zoom), by telephone, or face-to-face, based on the participant's choice. Verbal consent was obtained before the interview began. Each interview lasted between 20 and 30 minutes, was recorded, and transcribed verbatim by a scholar from the TÜBİTAK 1002 project. Transcripts were reviewed and verified by the researcher.

Since the interview questions were closely related to the study's main focus, the analysis was easier to carry out. After analysing interviews, four main themes (perceived effects of yoga, challenges & barriers, changing views on yoga, and implementation perception of yoga intervention) and 14 codes were identified.

4.2.3.1. Perceived Effects of Yoga Practice

This section presents the first theme, “Perceived Effects”, which includes the positive effects participants experienced from the yoga intervention. These benefits were grouped into three codes: physical benefits, psychological outcomes, and self-awareness (see Table 4.25).

Table 4.25. Thematic Coding of Perceived Effects of Yoga Practice

Theme	***Codes***	***Frequency (f)***
Perceived Effects	Physical Benefits	24
	Psychological Outcomes	22
	Self-Awareness	22

The most frequently reported perceived benefit of yoga was physical improvement (*f*=24), indicating that all participants experienced gains in areas such as posture, flexibility, strength, or relief from bodily discomfort (e.g., back or neck pain). Among these, strength was the most commonly cited benefit. Participants also noted improvements in posture and flexibility, while many reported pain relief and reductions in general muscular discomfort. Some described enhanced endurance, explaining that they could hold poses for longer durations. A few participants mentioned increased energy levels and a greater sense of vitality, stating they felt more active or energized. These statements reflect a growing awareness of bodily capabilities and suggest that participants developed more positive perceptions and attitudes toward themselves.

Participant responses regarding their perceptions of yoga's physical benefits are summarized as follows:

P6: *"I noticed that I could stand more upright. I felt that my muscles had strengthened. I realized that my posture had changed. Also, after practicing yoga regularly twice a week, I felt stronger. I can say it became easier for me to get out of bed."*

P8: *"My arms are usually very weak. But over the weeks, I noticed I could do the movements more easily. That’s why I think I got stronger."*

P18*:* *"I was really stressed that week, but after the course, I felt like I had released all that tension. For me, yoga was not just physical—it felt like mental therapy."*

P21: *"I really felt something during the meditation. Since I had never had any experience with meditation or yoga before, this may have felt like a big change for me… I welcomed it with great delight."*

P24: *"Physically, I became much stronger—definitely stronger. I could clearly notice this. I also noticed that I became more flexible. Movements felt easier. For example, I have aquariums at home and need to change their water. I used to struggle when carrying a bucket of water, but now I realize I can carry it more easily."*

The other most frequently mentioned perceived effect was psychological outcomes (*f*=23), as nearly all participants reported positive changes in their mental state, including reduced stress, enhanced clarity, and increased self-awareness. The most frequently cited psychological benefit was a reduction in stress and emotional relief. Many participants stated that yoga helped them relax, provided emotional stability, and contributed to a sense of mental calmness. Others emphasized more positive thinking patterns and greater psychological resilience, noting that they were better able to cope with daily challenges. A number of participants reported increased self-confidence, particularly in relation to overcoming perceived personal limitations. Some participants noted that the positive psychological effects were temporary, providing relief during or shortly after practice but not lasting into the following days. This suggests that while yoga can promote immediate emotional regulation and mental clarity, consistent and long-term practice may be necessary to sustain these benefits. A few participants also shared that they experienced improved sleep quality and a sense of mental clarity, especially when practicing yoga before bedtime. However, not all experiences were entirely positive. Some participants described initial emotional discomfort or stress at the beginning of the sessions. In addition, a few expressed uncertainties about the source of their emotional changes, questioning whether the benefits they experienced were directly attributable to yoga or influenced by other factors. Below are some quotations among the participants when asked for their reflections on the psychological changes related to yoga:

P17: *"During the time I was doing yoga, I felt mentally stronger… I was more resilient to everything."*

P10: *"I felt that it relaxed me emotionally as well… When I was stressed, I felt my stress decrease… Yoga was good for me."*

P20: *"Forgiving myself, loving myself… these were things I felt during yoga, and they made me feel really good emotionally."*

P5: "*To be honest, I don't think it created a long-term change. But I did feel a sense of relief after doing yoga. I would immediately go into sleep mode. Maybe it was because I was tired. As I said, I'm not someone who regularly exercises—or even exercises at all—so maybe the tiredness came from that. Still, I did feel a sense of peace. I felt like I had separated myself from the daily stress afterwards. But for me, it wasn't something that continued. I didn't experience a situation like, 'I do yoga regularly now, and I feel better.' That didn't happen for me."*

The code of "Self-Awareness" (*f*=22) revealed that participants experienced increased awareness of their body, breath, and internal states as a result of their yoga practice. The most commonly reported form of self-awareness was an enhanced sensitivity to bodily sensations, including the ability to recognize muscular engagement, physical tension, and other internal sensations while in poses. Many participants described how their attention had shifted to previously unnoticed physical experiences. Another key area of development was breath awareness. Many of the participants indicated that they had become more mindful of their breathing patterns, often realizing that their previous breathing was shallow or automatic. This heightened awareness led them to observe their breath more consciously during and outside of practice. In addition, several participants reported greater mental and emotional self-observation. They became more aware of their responses to stress and challenges and started recognizing behavioral patterns such as reactivity or perfectionism. Many also reflected on their strengths and limitations, indicating a broader sense of self-understanding and

introspection that emerged through the yoga experience. The following are some quotes from the participants:

P20: *"I'm someone who often confuses with left and right. In the beginning, I never knew which side I was supposed to move. It got a bit better over time, but I still mixed them up sometimes. I even got a tattoo on my right hand to help me remember."*

P23: *"In the warrior poses, you kept saying 'press the back leg, press the back leg.' Later, I finally understood what that really meant—how to actually press it. I realized it by watching myself on the screen. I really wasn't pressing it before."*

P6: *"While doing yoga, I also noticed my strengths and weaknesses. For example, I realized I'm a perfectionist… I became more aware of how I behave during practice."*

P24: *"I always felt that it relaxed me, both mentally and physically… I think it's calming and mentally refreshing. It's a form of meditation, really."*

P12*: "I started feeling muscles I had never felt before during yoga. I think it gives you bodily awareness. I began working muscles in my back or arms that I had never used before. And I think a connection began forming between my muscles and my brain."*

P14: "*While doing some poses, I noticed how my body reacts—things I had never realized before, like how I breathe. I noticed how my chest rises and falls, and how my muscles stretch."*

4.2.3.2. Challenges and Barriers to Yoga Practice

The second theme, Challenges & Barriers, shows the various challenging issues experienced by the participants throughout the yoga program. Based on the qualitative analysis, three codes were identified (see Table 4.26): physical challenges, internal resistance, and setting-related barriers.

Table 4.26. Thematic Coding of Challenges and Barriers to Yoga Practice

Theme	*Codes*	*Frequency (f)*
Challenges & Barriers	Physical Challenges	18
	Internal Resistance	13
	Setting Related Barriers	13

In the code of "Physical Challenges" (*f*=18), participants reported various health-related issues that made it difficult for them to fully engage in yoga practice. Many described experiencing muscle pain and discomfort, particularly in the legs, back, and shoulders. In addition to pain, students frequently mentioned physical limitations such as stiffness or lack of flexibility, which made certain poses difficult to perform. These challenges often led to feelings of frustration or discouragement during the sessions. Participants also reported fatigue and lack of energy, especially on days when they had demanding schedules or academic stress, which negatively impacted their motivation to attend or participate in courses. These physical and motivational difficulties were often attributed to external stressors such as school-related pressure or personal life challenges. Despite these difficulties, many participants indicated that they felt relaxed and better after the sessions and reported progressive improvements over time. As they continued practicing, they became stronger, more flexible, and more confident, which helped reduce the initial discomfort. These reflections highlight that while physical challenges were significant at the beginning, regular practice led to adaptation and increased physical capability. Here are some quotes from the participants:

P9: *"In the first course, I was really bad. I would lose my balance quickly, get very tired, and I wanted to quit… but by the last course, I could stay balanced much more easily."*

P1: *"I had a hard time with some movements… When I couldn't do them, it made me feel bad. On busy days, I didn't want to join the course, but once I did, I felt relieved afterward."*

P16: *"There was one pose—I think it was Warrior II, I'm not sure—but something really hurt. My legs felt tight and painful. Then you said something at some point, and I thought, 'Oh, I was doing this pose wrong.' Once I corrected it, the pain went away. I was getting really tired, but just when I felt like giving up, Shavasana would start. I really liked that."*

In the “Internal Resistance” code (*f*=13), participants discussed their issues with it being difficult to concentrate and remain attentive in yoga. One common issue was maintaining attention during breathing or meditation practices. Some participants were frustrated when they lost concentration and reported getting easily distracted or lost in the moment. Others were judgmental or experienced low confidence, particularly when they were unable to perform a pose or were comparing themselves with others. These emotions reflected discouragement and self-consciousness. Feeling nervous or shy in front of the others when they were on camera or in class was reported by some participants. Ask a question for fear of interrupting the session was mentioned, too. Even though these issues were challenging at the beginning, many reported they were able to improve as they accustomed themselves to the practice and gained confidence. Participants' responses are below:

P2: *"To be honest, I have social anxiety. That’s why I can’t attend any in-person sports activities. Even during the times, you were observing us, I would get extremely nervous."*

P5: *"I probably would have quit, thinking I just couldn’t do it. I would’ve felt quite discouraged too. Because I already know my body isn’t very flexible."*

P3: *"Breathing exercises are probably necessary, but I was getting bored. That’s probably because I couldn’t clear my mind or focus on the moment, and most likely because I was failing at it."*

P9: *"At first, yoga was a source of stress for me, because it was something I wasn’t used to at all. I was stressed in course, knowing everyone could see me on camera. But over time, it turned into something that helped reduce my stress."*

Under the code of “Setting Related Barriers” (*f*=13), the participants reported some environmental and technical problems that make it hard for them to participate in the yoga sessions. One of the most common problems was poor internet, specifically for online participants, who faced problems such as losing connection, freezing screens, or not being able to see the teacher properly. All the participants from online reported

issues with the online environment, such as with the internet and the camera. Some, however, preferred the online environment as it made them feel more comfortable, especially those who suffered from social anxiety or shyness, and participants who work and live far from the studio. Some participants noted things that bothered them at home, like noise, lack of a personal space, or disruption from other members of the household, which made practice concentration challenging. Additionally, some participants in the in-person group noted that a crowded classroom made concentration challenging, citing that having too many people in the room interfered with their concentration and made them worry about touching or bothering others. The small size of the studio and inadequate air circulation were also raised as problems. For all these, the majority of participants managed to adjust and still went on attending the sessions. Here are some quotes from the participants:

P24: *"What were the things I struggled with? … At one point, the internet was cutting out a lot… When that happened, it was hard for me to refocus and get back into it."*

P3: *"The only thing I didn't like was probably the stuffiness of the space, the lack of fresh air. If I had done it somewhere with sunlight, it probably would have relaxed me much more. Or if it had been an airier place. Other than that, there was nothing I didn't like."*

P2: *"During meditation, I sometimes thought, 'Did the teacher get disconnected? Why isn't she saying anything?' That distracted me because you need to focus more in that part."*

P23: *"Sometimes the internet would freeze. When it did, I'd get stuck in a pose… You're frozen. Then I'd come out of the movement. Something would get lost there — that flow."*

P21: *"In some poses… like turning the foot slightly—this way or that way—I couldn't fully see it. Because the computer was far away, and while trying to look, I'd miss the position. Some movements just weren't fully visible, so I couldn't always do them correctly. And I didn't ask questions either. Since the group was big, I hesitated. I didn't want to interrupt the course."*

P16: *"Sometimes while doing the movement, my phone would fall. Also, since I couldn't see you full-screen, I had trouble understanding some of the movements. I can't do them just by hearing. I need to see. And I couldn't see properly on the screen."*

P2:*"Not every movement is visible on the screen. So sometimes I think, 'Am I doing this right? Am I about to do something that could hurt me?'"*

4.2.3.3. Changing Views on Yoga

This section mentions the third key theme, "Changing Views on Yoga", which looks at how the participants' thoughts and feelings about yoga changed throughout the 8-week program. The majority of them started with doubts, bias, or a limited view of yoga, but their experiences during the sessions changed. The study found two main codes that showed how these points of view have changed throughout time (see Table 4.27).

Table 4.27. Thematic Coding of Participants' Views on Changing Views on Yoga

Theme	***Codes***	***Frequency (f)***
Changing Views on Yoga	Bias	17
	Perceived Physical Challenge	16

One of the shared concepts discussed in "Changing Views of Yoga" was bias about yoga (*f*=17). Participants did have many different biases without knowledge about the practice beforehand. To begin with, they conceived of yoga as something "for the rich," "just stretching," or "only spiritual". Some thought it was only for flexible individuals, or it was too slow, easy, or not challenging enough for them. Others questioned its benefits and did not know what else yoga did, except stretching or breathing. Some of them were also uneasy with the spirituality or mysterious aspect of yoga and labelled it as "made up", "too spiritual", or even "like a religious". Others reported the use of the internet or watching Netflix documentaries as sources of their misinformation, such as concern over commercialism or even lying. Even with such initial impressions, most reported that their experience in the intervention changed

their perspective toward yoga. As they practiced more frequently, they found that yoga was physically challenging, calming for the mind, and far more beneficial and effort to pay than previously imagined. Participants' biases are discussed as follows:

P17: *"… I used to see it as something religious. After all, some people viewed it that way. And also, how should I say… There were those main yoga figures I watched on Netflix and such. I saw things about their scams and frauds. I used to think, 'How do people fall for this?' So yes, my view was quite negative."*

P16: *"My bias was that it was a very spiritual practice, and I thought not everyone could do it — only certain elite or privileged people."*

P7: *"It seemed religious to me… because I thought there wasn't much physical activity involved, just emptying the mind, and that the movements wouldn't physically challenge a person."*

P3: *"… yoga actually felt like something made up to me…" …"*

As coded under Perceived Physical Challenge (*f*=16), the participants recognized that the exercise was more challenging than they expected. Most of them thought they were going to do an easy exercise or that required flexibility. They found the exercise required more strength and more endurance than they expected. Movements that appeared simple—such as holding downward-facing dog or transitioning through floor poses—often led to shaking muscles, soreness, or fatigue. Participants mentioned struggling with poses that required arm strength, complaining of tired or shaking arms, sore knees, and limited flexibility in the back or legs. Despite these challenges, most participants stated they gradually accustomed themselves to it, built up their strength, and began to feel better in their bodies. These reflections indicate that although yoga was physically challenging for participants, it also made them aware of improvement and more attuned to their bodies over time. Participants views of physical difficulites that they faced with are as follows:

P3: "*I didn't know that yoga required this much strength. My arms were shaking in the poses. There were many times I felt weak, but I improved over time."*

P17: *"At first, I thought it would be easy, but it wasn't. I especially struggled with my legs and knees."*

P11: *"In the beginning, my muscles were incredibly sore. I didn't expect it to be this challenging."*

4.2.3.4. Implementation Perception of Yoga Intervention

This section presents findings under the theme of Implementation Perception, which focuses on how participants experienced the yoga program. It covers their preferences between online and in-person formats, as well as challenges related to scheduling. Improvements could be made in future implementations, also mentioned by them as a suggestion. Based on the analysis, two codes were identified: Format Preferences and Scheduling Demands (see Table 4.28).

Table 4.28. Thematic Coding of Implementation Perception of Yoga Intervention

Theme	***Code***	***Frequency (f)***
Implementation Perception	Format Preferences	24
	Scheduling Demands	16

Under Format Preference code (*f*=24), all respondents discussed the pros and cons of the format in which they participated (either in-person or online). Of the 12 respondents in the in-person group, 10 (≈ 83%) said they preferred in-person sessions. They indicated that they liked receiving feedback directly from the teacher, made them more motivated, and liked practicing with others. Out of the in-person group (*n*=12), only 2 participants (≈17%) reported minor inconveniences, such as a cold and an insufficiently ventilated room or trouble getting to class; however, overall, they preferred to take this intervention in-person.

In the online group (*n*=12), 7 participants (≈58%) preferred the online format of the course due to its convenience, time savings, and being able to practice/learn from the comfort of their home. But five of the people who took part (≈42%) stated they would prefer to have courses in-person. They said that the online format had some disadvantages, such as not being able to see the teacher properly or not feeling as involved.

Interestingly, some people stated being unhappy at first about being put in the online group eventually said they were happy for being in the online group. Although they had hoped for in-person sessions at the start, many eventually appreciated the comfort, flexibility, and reduced stress of practicing at home. This shift suggests that initial expectations may evolve positively when participants directly experience the physical and psychological benefits. Participants shared their thoughts on how they found the format as follows:

P24: "*I think it would have been much better if it hadn't been online. Because sometimes you need to be corrected, and sometimes I might need to see things clearly. Issues like internet problems… These kinds of things can cause some difficulties when it's online."*

P5: *"Actually, I initially wanted to join the in-person group. But then I realized that with my work shifts and everything, going to the studio and coming back would be very tiring for me. That might even cause me to quit early. So, I chose the online option. I live far from the studio, so the online courses were a great convenience for me."*

P22*: "I enjoyed attending the in-person courses because I think your energy created a nice atmosphere among all of us. That's why I generally prefer in-person settings—because people's energy transfers to one another."*

Under the code of Scheduling Preferences (*f*=21), most participants mentioned how many times sessions should be organized and how long they should last, and how this fit into their schedules. Most people tended to agree that, especially for beginners, it was ideal to have 2 sessions a week. They found it manageable alongside school/work schedules and had enough time to rest and recover between sessions. Some mentioned

that more than two sessions could be too much, while 1 session a week could disrupt routine or lead to slower progress.

Some participants indicated that doing yoga three times a week could help their bodies get used to it and get them more benefits. Others noted that they would join an extra course if they could because they liked doing it and liked being more active.

In terms of session length, the 60-minute session was widely accepted as the most balanced and effective session flow length. Participants felt it was long enough without becoming tiring or boring. The structure with the movement followed and breathwork/meditation made for an efficient program that was described by participants. Only a few participants indicated that they would like the session length to increase, more based on their capacity and experience.

Some participants felt that the current length was appropriate; they indicated that it might have been too hard to increase the duration. The participants did express recommendations for how to improve the timing and spacing of the courses. Some participants wanted the sessions spread more evenly throughout the week, while others liked a more flexible schedule or selected their days. Participants also suggested adding a short introduction to yoga philosophy or techniques at the beginning of the program, especially for participants new to yoga. Below are participants' feedback on scheduling in program design:

P10: *“I think two months was a bit short. It could have been better if it were a little longer. Other than that…Twice a week was fine, I think. That schedule worked well. The flow of the course was also good, actually. Maybe it would be helpful to provide some kind of resource or material about yoga before starting the sessions, so we could know a bit more beforehand.”*
P14: *"Maybe there could be a bit more information before the courses about which movements will be done. That way, people could have a better idea of what to expect."*

P11: *"I think two days a week was a good frequency, but maybe the session duration could have been extended to one and a half hours. Because with the breathing exercise*

we do at the end, it totals one hour. Maybe the physical part could have been one full hour, with the remaining time allocated to the breathing exercise."

4.2.4. Long-Term Adherence Research Question and Results

RQ-10: Is there a significant difference in yoga adherence levels (i.e., not practicing, occasional practice, regular practice) between participants who engaged in in-person versus online yoga practices during the one year following the completion of the intervention?

Results of Long-Term Adherence: Mathematical statistics and chi-square tests were conducted to examine whether significant differences in yoga adherence levels existed between groups and adherence to yoga and any association between them. Results were shown in Table 4.29.

Table 4.29. Yoga Adherence Summary by Group

Adherence Questions	***In-Person***		***Online***	
	n	***p(%)***	***n***	***p (%)***
No of Participants Enrolled	17	89.47	19	100
Not Practicing Yoga	5	29.4	12	63.16
Practising Yoga	12		7	
Practicing Regularly	4	23.53	1	5.26
Practicing Occasionally	8	47.06	6	31.58
Practiced at Home	6	50	3	42.86
Practiced at Studio	6	50	4	57.14

According to Table 4.29, at the one-year follow-up, notable differences were observed between the in-person and online groups in terms of adherence to yoga practice. In the in-person group, 17 participants out of 19 completed the questionnaire, and 29.4% (*n*=5) reported that they were no longer practicing yoga, whereas 70.60% of them (*n*=12) continued yoga. Among participants in the in-person group who continued yoga practice**,** 23.53% (*n*=4) maintained a regular practice, while 47.06% (*n*=8) reported practicing occasionally. In contrast, within the online group, all participants (*n*=19) completed the questionnaire. A considerably higher proportion, 63.16% (*n*=12), indicated that they had discontinued yoga practice. Only 5.26% (*n*=1) continued practicing regularly, and 31.58% (*n*=6) practiced occasionally. Among

those who remained active in yoga (regularly or occasionally), 50% (*n*=6) of in-person participants practiced at home and 50% (*n*=6) practiced in a studio setting. In the online group, 42.86% (*n*=3) reported home practice, while 57.14% (*n*=4) practiced in a studio.

A chi-square test of independence was conducted to examine the association between group type (in-person vs. online) and yoga adherence level (not practicing, occasional, and regular practising). The chi-square test result indicates a statistically significant association between the type of yoga intervention (in-person vs. online) and participants' yoga adherence status one year after the intervention, $\chi^2(2, N=36)=6.32$, $p=.04<0.05$. Participants in the in-person group were more likely to continue practicing yoga, either occasionally or regularly, compared to those in the online group. This suggests that the mode of yoga intervention plays a critical role in sustaining long-term yoga adherence. Since $p<.05$, it was rejected the null hypothesis.

Another question asked participants whether they had initiated a new sport activity (excluding walking) within one year after the yoga intervention. The responses are summarized in Table 4.30.

Table 4.30. Initiation of a New Sport Activity Within the Past Year

	In-Person (n)	***Online (n)***
Started a New Sport		
Yes	5	8
No	12	11
Types of sports started	Pilates, Zumba, Fitness, Cardio, Running, Swimming	Fitness, Zumba, Tennis, Pilates

Thirty-six of the 38 participants from the intervention group who participated in the adherence questionnaire. According to the answers showed in Table 4.33, in the in-person group (*n*=17), 29.4% (*n*=5) reported that they had initiated a new sport, while 70.6% (*n*=12) had not. In contrast, a slightly higher proportion of participants in the online group (*n*=19), 42.1% (*n*=8), reported starting a new sport, whereas 57.9% (*n*=11) did not. Among those who became physically active in new ways, the in-person

group engaged in pilates, zumba, fitness, cardio, running, and swimming, while the online group most frequently reported fitness, zumba, pilates, and tennis.

4.2.5. Mixed Method Integration Research Question and Results

RQ-11: How do we combine quantitative and qualitative findings to explain the effects of yoga intervention?

Results of Mixed Method Integration: First of all, variables of tests measuring strength, balance, flexibility, and body composition are presented separately in the table below (Table 4.31), followed by an integrated interpretation explained in detail for each domain.

Quantitative findings showed significant improvements in strength and flexibility in intervention groups, with more substantial gains in specific areas depending on the group (e.g., core strength improved more in the online group). The balance showed some improvement, but the results varied based on the test type and were not consistent across all participants. Body composition showed significant changes between the groups. All group participants gained weight and increased their fat percentage.

Qualitative data supported the findings for strength and flexibility. Many participants reported feeling physically stronger, noticing improved posture, and finding it easier to perform movements. Flexibility was also frequently mentioned as a benefit. However, very few participants mentioned improvements in balance. None of the participants mentioned body composition. These changes may have been too subtle to notice or were not perceived during the short duration of the program.

Table 4.31. Integrated Results on Physical Fitness Parameters

Variable	***Quantitative Result (RQ1: Between-Group)***	***Quantitative Result (RQ2: Within-Group)***	***Qualitative Perception***	***Integrated Interpretation***
Strength	No significant difference among groups	Significant improvements in both IPG and	"Increased muscle strength" and "feeling	Quantitative strength gains *align with* subjective

		OG (Sit-up, HGST)	physically stronger" were dominant themes. Also noted: better endurance during postures	strength and confidence improvements
Balance	Significant between-group differences: DLEO (OG > CG)	Significant within-group gains: IPG (DLEC), OG (Non-DLEC), CG (DLEO)	Not cited explicitly, but some references to improved posture, stability Mostly awareness	Data showed improvements in different balance conditions, *not* perceived by participants
Flexibility	No significant difference among groups	Significant improvements in both IPG and OG (SRT, BST-Left/Right)	"Increased flexibility" and "easier to move"	Subjective experiences *reflect* improved flexibility in both groups
Body Composition	No significant difference among groups	Significant increase in BMI and Fat% % in IPG, OG, and CG	Not directly mentioned	*Not corresponding to* reflect changes in body composition

***Note**: IPG= in-person group, OG=online group CG= control group*

There was a strong alignment between measured and perceived improvements in strength and flexibility. Participants not only performed better in tests but also reported feeling stronger and more flexible. In contrast, improvements in balance and changes in body composition were less noticeable in both the data and participants' reflections, possibly because these changes take longer to become apparent or were not substantial enough during the short intervention period.

Secondly, the results of psychological outcomes and self-efficacy, as measured by yoga scales, are analyzed. The perceived stress, perceived health, and yoga self-efficacy are presented separately, both quantitative and qualitative analysis results in the table below (Table 4.32).

Table 4.32. Integrated Results on Perceived Stress, Perceived Health, and Yoga Self-Efficacy

Variable	***Quantitative Result (RQ1: Between-Group)***	***Quantitative Result (RQ2: Within-Group)***	***Qualitative Perception***	***Integrated Interpretation***
Perceived Health	OG>IG better perceived health after intervention	Non-significant within-group change	Reported as feeling healthier and more energized.	Partial alignment: qualitative improvements not strongly reflected in objective results
Stress	Significant difference between IPG and CG	Significant reductions in both IPG and OG	Participants reported feeling calmer, less tense, and more emotionally stable; greater ability to cope with daily stressors	Strong alignment: both perceived and measured reductions in stress support effectiveness of the intervention
Self-Efficacy: Body	Significant differences: IPG> CG and OG>CG	Significant within-group improvement in IPG	Improved physical control, balance, and ease in movement. Participants felt more confident in postures.	Strong alignment: Subjective experiences match statistical improvements in body-related self-efficacy.
Self-Efficacy: Breath	Significant differences: IPG> CG and OG>CG	Significant within-group gains in OG	Enhanced breath awareness, improved control, and greater comfort during deep breathing.	Clear match: Breath regulation and control improvements were evident in both group sources.
Self-Efficacy: Mind	Significant differences: IPG>CG and OG>CG	Non-significant within-group change	Few mentioned enhanced cognitive focus or meditation awareness.	Partial alignment: Quantitative improvement was not strongly reflected in participants' verbal reports. More time or mindfulness structure may be needed.

Table 4.32. (continued)

Total Self-Efficacy	Significant differences: IPG>CG and OG>CG	Significant within-group gains in both IPG and OG	"Gained confidence", "felt capable", "stronger in body and mind", "overcame limits"	Strong consistency: general increase in self-efficacy reflected across both data sources

***Note**: IPG= in-person group, OG=online group CG= control group*

The study revealed that individuals who practiced yoga online and in person were less stressed compared to those in the control group. The majority reported feeling more relaxed, calmer, and relieved after practicing yoga. Qualitatively mentioned that they could manage daily stress more effectively, slept well, and thought more clearly. The study's findings and the individuals' reports aligned well. The reduced level of stress revealed in the study aligned with participants' reports, confirming that yoga benefited their mental well-being and prepared them to cope with daily problems.

Quantitative outcomes for perceived health reflected a significant difference between the online yoga group and the control group, but no significant changes in the groups over time. Qualitatively, a lot of the participants reported feeling healthier, more energetic, refreshed, and improved in their physical health. They reported that they performed better in their activities, slept better, and had more energy. There is partial alignment between the measured and perceived outcomes. This may indicate that the perceived health benefits of yoga are more clearly felt by individuals than by quantitative test measurements. This could mean that people feel the health advantages of yoga more strongly than short-term measurements. Or the question about “how is your health overall” might have been too broad to catch the small improvements they felt during the short program.

Quantitative results showed significant improvements in self-efficacy across all three sub-dimensions—Body, Breath, and Mind—especially in comparisons between the intervention group and the control group. Qualitative findings strongly supported the Body and Breath domains. Many participants reported feeling physically stronger and confident in their movements. They also expressed awareness and control over their breathing, which aligns with the test results, particularly for the online group. However, the Mind component showed less qualitative support. Only a few participants mentioned improvements in focus, mental clarity, or meditation-related experiences. Therefore, there is strong consistency between measured and perceived gains in the Body and Breath domains of self-efficacy. Participants felt more capable and aware of their physical and respiratory abilities. In contrast, the Mind domain,

despite showing significant changes in test results, was not often reflected in participants' views. This suggests that mental aspects of self-efficacy may develop subtle change, and require longer-term practice or more structured mindfulness tests.

CHAPTER 5

DISCUSSION

The primary purpose of the study was to compare the effects of in-person and online hatha-based Iyengar yoga programs on various variables: physical fitness components (strength, balance, flexibility, and body composition), perceived health status, perceived stress levels, self-efficacy in yoga, and adherence to yoga practice among healthy young adult women aged 18 to 30. An additional purpose of the study was to explore participants' perceptions and personal experiences regarding the effects of in-person and online yoga practices using a qualitative approach. In light of these purposes, this chapter aims to discuss the results of the quantitative and qualitative studies by comparing them with findings from previous research. Finally, recommendations for future studies will be provided.

5.1. Interpretation of The Quantitative Data Results

The study addressed two primary research questions, each of which was analyzed using 17 variables. The first research question focused on the differences among the three groups (in-person yoga, online yoga, and control), while the second research question evaluated the progress of each group from the beginning to the end of the study. Shortly, the first research question addresses the comparative impact of the yoga program across groups, and the second focuses on the effectiveness of the intervention within each group over time.

5.1.1. Strength

The Hand-Grip Strength Test and One-Minute Sit-Up tests were used, and there were no statistically significant differences between the three groups in response to the

first research question. On the other hand, both the in-person and online yoga groups showed significant improvements in increasing muscular strength in response to the second research question. Notably, while hand-grip strength improvements were similar in the intervention group, the online group demonstrated larger improvements in core strength, as measured by the sit-up test.

The results revealed that hatha-based Iyengar yoga is an effective way to develop muscular strength, as both the in-person and online yoga groups exhibited statistically significant gains in hand grip strength and sit-up performance from pre- to post-test. However, there were no statistically significant differences between groups at post-test, suggesting that both programs, whether in-person or online, did not result in a significant difference in strength to be identified at the group level.

No studies have examined the effects of online yoga, despite the majority of research on the strength-related benefits of yoga being conducted traditionally in-person. Regardless of the length of the intervention (Jin et al., 2016; Madanmohan et al., 1992; Shiraishi & Bezerra, 2016; Telles et al., 2009), participants age (Bhonde et al., 2014; Halder et al., 2015;), health status (Baltag et al., 2024; Dash et al., 2001; Telles et al., 2009), or style of yoga (Cowen et al., 2005; Zhu et al., 2021); in-person yoga intervention in the literature consistently showed improvements in muscular strength. Consequently, it can be said that yoga, regardless of its particular style—including Iyengar yoga—has a generally beneficial impact on strength.

Besides them, the present study showed a different outcome. Although previous studies have generally shown greater improvements in muscular strength through in-person yoga groups, the online group demonstrated a greater change in abdominal strength from the pre-test to the post-test. In addition, the benefits of an in-person program, such as real-time feedback and social interaction, placed further weight on this expectation. The advantages of the home environment may explain this unexpected outcome. The home environment was likely to have been more relaxed and adaptive, possibly improving motivation and conformity (Büssing et al., 2012; Dayananda et al., 2014; Ross et al., 2013). Participants were possibly less anxious and could move around at their own pace without being judged. Additionally, some

participants in the online group may have had prior experience with sports or yoga. This approach may have been practical in the group, resulting in more noticeable improvement. This finding aligns with research indicating that previously active individuals may recover more quickly upon returning to sport, due to the presence of muscle memory (Bruusgaard et al., 2010).

Future studies should consider factors such as small sample size, individual differences in response to yoga, and the possibility that both in-person and online formats may be equally effective in building strength. Although yoga seems helpful for improving strength, how it is delivered may not be a key factor in its success.

5.1.2. Balance

A single-leg balance test with four dimensions (DLEO, DLEC, Non-DLEO, Non-DLEC) was applied among three groups. The results show that both in-person and online hatha-based Iyengar yoga helped improve balance, but in different ways.

In the first research question, a significant difference was found between the online and control groups in the DLEO post-test. Indicating that online yoga helped improve balance on the dominant leg with eyes open; however, the in-person yoga did not. Additionally, no differences were found between groups in the other balance tests (DLEC, Non-DLEO, Non-DLEC).

In the second research question, the in-person yoga group showed a significant change in DLEC, indicating that the balance of more participants improved from pre-test to post-test when standing on the dominant leg with eyes closed. The result may be attributed to the advantages of real-time feedback and posture correction provided by the instructor, particularly in facilitating accurate balance control on the dominant leg (Paillard & Noé, 2020). The online group changed significantly in Non-DLEC, meaning their balance improved on the non-dominant leg with their eyes closed. This result that can be attributed to self-practice and self-reflection at home, as individuals could focus without the pressure of performance (Büssing et al., 2012; Ross et al., 2013). The control group also showed a change in DLEO, but it was a negative one,

meaning their balance deteriorated. This suggests that a lack of regular physical activity may be one of the contributing factors in reducing postural control, especially in contexts where balance is more crucial (Hoffman et al., 1998). Overall result suggests that hatha-based Iyengar yoga is particularly beneficial for enhancing balance in eyes-closed conditions, where body awareness and proprioception are more challenging (Verma et al., 2023).

One additional explanation for these results is related to the distinctive character of Iyengar yoga. Research has suggested that Iyengar yoga may offer more therapeutic benefits, particularly for the elderly or individuals with orthopedic or other health conditions (Haynes et al., 2022; Oken et al., 2006). While Iyengar yoga includes many standing poses intended to promote strength and stability, it does not typically include significant amounts of balance poses with closed eyes, a practice found in some other yoga interventions (Prado et al., 2014). Because of this, the neuromuscular changes required for balance when the eyes are closed may take more than the 8 weeks of practice used in this study to develop fully (Prado et al., 2014). This suggests that although Iyengar yoga may increase general balance and strength, it might be less beneficial in improving more challenging balance tasks that require increased sensory integration over a short period of intervention, especially for healthy participants (Halder et al., 2015).

Another reason for the lack of significant differences may be the fatigue caused by the length of the testing protocol, which included two trials under four different conditions in the single-leg balance test. Testing both the dominant and non-dominant legs, along with other physical assessments, may have further contributed to participant fatigue. Balance is usually the same for both legs, except in cases where someone is recovering from an injury or returning to sports (Schorderet et al., 2021). Thus, balancing with only one leg could be a suitable method for testing balance, as it is simpler than balancing with two legs, and could be recommended for future research.

This study demonstrated that both in-person and online Hatha-based Iyengar yoga were effective in improving balance in healthy young adults, with online yoga being slightly more effective. The results suggest that yoga is beneficial for improving

balance when the eyes are closed, possibly by strengthening body awareness and proprioception. While past studies have suggested these benefits, many have not directly measured them or reported limited results (Jeter et al., 2015). This study offers new insights by demonstrating that yoga can enhance balance among healthy individuals under conditions where vision is limited. Future studies with longer programs and simpler balance tests may give more precise results.

5.1.3. Flexibility

Sit-and-reach and back scratch (for left and right sides) tests were used to assess flexibility among the three groups. For the first research question, there were no significant differences between the three groups at either pre-test or post-test. However, the second research question revealed important changes within the groups over time. Both the in-person and online yoga groups showed significant improvements in all three flexibility tests (SRT, HGST_Left, and HGST_Right). Since the in-person and online groups improved their lower body flexibility, as measured by SRT, the online group showed a slightly greater improvement in this area. However, when it came to upper body flexibility, tested by HGST, the in-person group showed much better progress than the online group. In contrast, the control group did not show any significant changes in flexibility. As a result, there was no significant difference between in-person and online yoga programs; both groups showed significant improvements in flexibility. This means that yoga was effective, but the program difference did not impact flexibility outcomes.

It is widely studied that yoga enhances flexibility (Âmin & Goodman, 2014; Grabara, M., 2016; Kartal & Ergin, 2020). However, a more detailed examination of the differences between the intervention group is necessary. Notably, the greater improvement in lower body flexibility observed in the online group may be partly attributed to participants having more freedom to practice in their own space and at their own pace (Pham et al., 2024). Another possible factor influencing these results is the difference in group characteristics. The online group had a higher average age and included working individuals, who are more likely to experience musculoskeletal strain and reduced flexibility due to prolonged sitting habits (Griffin & Sayers, 2019;

Janwantanakul et al., 2012). As a result, these participants may have initially started with increased muscle tension, which could explain the more pronounced within-group improvement observed in the sit-and-reach test. In contrast, the in-person group consisted entirely of students, whose age and lifestyle were more homogeneous, and who appeared to have a higher baseline flexibility and less muscle tension. This may account for the comparatively more minor gains in sit-and-reach scores observed in that group.

However, the in-person group showed more progress in upper body flexibility, possibly due to the benefits of direct instructor guidance and physical and immediate hand corrections. Another reason for a greater increase in upper body flexibility in the in-person group might be the use of props typical of Iyengar yoga. The use of props enables correct alignment, enhances body awareness, and allows participants to achieve challenging postures more safely and effectively (Chana, 2025; Evans et al., 2013). For a prop, the yoga belt was used during the intervention for both groups. For example, shoulder and upper arm positioning in Gomukhasana (Cow Face Pose), which is assessed by the hand grip strength test, was practiced repeatedly with the aid of a belt (Iyengar, 2000). Both groups practiced this yoga pose repeatedly with various modifications (Iyengar, 2000), which likely enhanced the in-person group's shoulder flexibility. However, the in-person group likely benefited more from the instructor's hands-on corrections, such as guiding the proper use of the yoga belt and adjusting the shoulder area during poses. These personalized supports may have played a significant role in enhancing upper body flexibility in the in-person group.
Lastly, the control group was not found to have significantly changed, which highlights the role of active yoga engagement in improving flexibility.

Overall, the improvements observed in both groups suggest that Hatha-based Iyengar yoga is effective in enhancing flexibility; however, no significant differences were found between the programs (in-person vs. online). Future studies examining flexibility should consider participants' conditions, including age, lifestyle, and baseline physical limitations.

5.1.4. Body Composition

For measures of body composition, body mass index (BMI) and body fat percentage (BFP) were analysed. For the first research question, there were no significant differences between the three groups (in-person, online, and control) among body composition components. This means that the groups were similar in body composition before and after the intervention. Interestingly, for the second research question, all three groups showed significant changes in body composition. From pre- to post-test, body mass index (BMI) and body fat increased in all three groups. This was not predicted, particularly for the in-person and online group, where yoga sessions were expected to reduce BMI and percentage of fat (Choudhury et al., 2024; Nongkhai et al., 2022; Seo et al., 2012). One possible explanation is that while the Iyengar yoga enhanced flexibility, strength, and balance, the eight-week length may have been too short and the practice not frequent enough to generate appreciable fat or weight reduction. Another factor that would have also affected the result is the daily habits of the participants. The majority of participants reported using their smartphones frequently, skipping healthy breakfasts, and consuming sugar regularly. A low intake of fruits and vegetables was commonly observed among participants in all groups. The online group consumed some alcohol, the control group consumed more meat and dairy, and the in-person group had the most sweets and smoking. These behaviors could have reduced the potential impact of yoga, particularly because there was no regulation of what individuals consumed or viewed throughout the study.

Similar to the findings, a review by Choudhury et al. (2024) revealed that not all studies result in a decrease in body fat. Short-term courses, such as those conducted by Sil (2017) and Thakur (2019), which lasted six weeks, and Pandit et al. (2019), which lasted one week, did not alter body composition. Csala et al. (2021) detected no differences in body fat, BMI, or heart rate after 10 Hatha yoga courses for young women. Building on these results, Lauche et al. (2016) reviewed 30 randomized controlled trials. They found that yoga decreased the waist-to-hip ratio and BMI in overweight individuals, although not equally across all participants. This variation suggests that the extent to which yoga influences body composition may be influenced

by the duration of the yoga program, intensity, participants' body composition, and their adherence.

However, studies have proven that yoga helps to decrease BMI and body fat (Nongkhai et al., 2022; Seo et al., 2012). Choudhury et al. (2024) reached a similar conclusion in their review, demonstrating the ability of long-term yoga practices to decrease body fat percentage among various individuals. These results suggest that yoga can be an effective method for managing body composition.

Overall, the program, whether in-person or online did not result in significant differences. However, group-specific characteristics—such as age, lifestyle, or baseline fitness—may have influenced outcomes like BMI and body fat. This suggests that participant profiles, rather than delivery format alone, could play a more important role in specific physical responses to yoga. These findings are consistent with other studies suggesting that short-term yoga may not significantly alter body composition in healthy young individuals (Csala et al., 2021; Lauche et al., 2016). This finding is consistent with the larger observations of Hall et al. (2012), who underlined that understanding energy balance requires longer-term research and an integrated approach. Unhealthy eating habits, individual variations, and the intervention's limited intensity and duration may have all contributed to the outcomes. Future studies should, all things considered, integrate yoga with lifestyle advice and assess long-term impacts using more thorough approaches.

5.1.5. Perceived Health

The Perceived Health Status Questionnaire was used for both between-group (RQ1) and within-group (RQ2) analyses. Based on the findings, it can be concluded that participants who engaged in both in-person and online yoga reported feeling healthier after the intervention compared to those in the control group. The online group showed a slightly better perceived health outcome than the in-person group. This suggests that yoga, whether practiced in-person or online, may have a positive impact on how individuals perceive their overall health. However, the examining individual change (whether someone improved, stayed the same, or worsened) was not significantly

different between the groups during the intervention. This suggests that although yoga participants reported feeling healthier at the end, the overall shift in health perception over time was not significantly different among the three groups.

Research indicates that yoga can enhance the perceived health of individuals of all ages, regardless of the type of intervention employed (Lim et al., 2021; Nguyen et al., 2024). In this study, the online group reported slightly higher health scores, which could be influenced not only by their yoga practice but also by various socio-demographic factors. Many participants in this group were employed, came from middle- or upper-middle-income backgrounds, and lived with their families, which is known to contribute to better health outcomes by providing greater access to resources and emotional support (Adler & Stewart, 2010; Marmot, 2005; Thoits, 2011). They also had the lowest smoking rates, but they were the only group that mentioned having an alcohol consumption. This could suggest a higher level of openness and health awareness.

In contrast, the in-person group primarily consisted of younger university students who studied engineering, lived in dormitories, and were from a lower-middle-income background. Although younger adults are often in good physical health, they may have less developed frameworks for evaluating broader aspects of well-being (Arnett, 2000). According to Arnett's (2000) theory, people aged 18 to 25 experience a distinct period in life known as emerging adulthood. At this time, they are still exploring who they are, and their life choices are often unstable; their idea of being an adult is still in development. During this phase, young adults may focus more on their studies, social life, or planning for the future rather than being aware of their health perception. Unlike those in the online group who have jobs or family support, the in-person group may have faced less structure and support regarding their well-being. These differences may help explain why the in-person group did not show any notable improvement in their perceived health, despite participating in the same yoga program.

Another aspect is that the program's duration might not have been long enough to change the health perception of the younger population. Previous studies have demonstrated that yoga can improve perceived health, particularly among older adults

and the general adult population (Lim et al., 2021; Nguyen et al., 2024). Additionally, younger individuals may require more guidance or educational support to fully understand the concept of health, particularly in a brief program like this. Therefore, when designing future studies for young adults, it may be beneficial to incorporate additional sessions, such as nutrition education, stress management workshops, or general health promotion, alongside the regular interventions.

5.1.6. Perceived Stress

To measure perceived stress, the Perceived Stress Scale (PSS) was used. For the first research question, both the in-person and online groups reported reduced stress levels compared to the control group, indicating that yoga intervention were more effective than no intervention. There was not a big difference between the two types of intervention, but the online group had a somewhat more potent effect. For the second research question, participants in the intervention group reported feeling less stressed over time; however, the control group did not show any improvement. The larger effect size observed in the in-person group points to a more substantial within-group change. This suggests that in-person hatha-based Iyengar yoga may offer a slightly more impactful for managing stress.

Studies consistently show that yoga reduces stress across various populations. A meta-analysis by Cramer et al. (2013) found yoga beneficial for individuals with depression. It has also been effective among remote-working women (Sadawarte & Sahasrabuddhe, 2022), nursing and medical students (Giri et al., 2021; Kalavalli et al., 2022), people with chronic illnesses (Devi & B, 2025; Miao et al., 2023), students and trainees (Alan et al., 2024; Jeter et al., 2013), and people with chronic conditions (Berlowitz et al., 2020). Yoga and Tai Chi help balance the nervous system, alleviating stress (Zou et al., 2018). A review by Stillwell et al. (2017) supports the stress-reducing effects of yoga, breathwork, and mindfulness. Physiological evidence suggests that stress reduction can be achieved through regular practice (Huang et al., 2013). Iyengar yoga, in particular, has shown benefits in reducing stress, anxiety, and depression among women, including breast cancer survivors (Harner et al., 2010; Bower et al., 2011; Fischer et al., 2022; Michalsen et al., 2012).

Although many studies show yoga's impact on perceived stress, some research still debates its effectiveness. Several studies have reported minimal or no significant changes in perceived stress. For example, Sohl et al. (2016) and Köhn et al. (2013) found inconsistent or non-significant results, attributing this to differences in yoga intensity and lack of engagement monitoring. Similarly, McClendon & Scott (2018) and Yüce & Muz (2020) reported limited benefits, highlighting issues like low motivation and minimal reductions. Other researchers, such as Khalsa et al. (2011) and Michalsen et al. (2012), pointed out that many yoga studies have methodological problems or are influenced by outside factors. This means that the effects of yoga on perceived stress may change depending on the setting, and stronger, better-controlled studies are needed to make clear conclusions.

Overall, the findings suggest that both in-person and online hatha-based Iyengar yoga are effective in reducing perceived stress among young adult women. While the online group showed slightly better group-level outcomes, the in-person group demonstrated a more substantial individual impact. These results align with previous literature supporting yoga's stress-reducing benefits. However, they also highlight the need for future research to consider delivery format, participant engagement, and methodological rigor when evaluating stress-related outcomes. Future research also considers that self-reported measures should not only measure stress but also include physiological markers.

5.1.7. Self-Efficacy

The findings from the first and second research questions collectively support the conclusion that participation in either in-person or online hatha-based Iyengar yoga intervention led to improvements in yoga self-efficacy. Results showed that the in-person program produced relatively stronger gains across all subscales. For the first research question, no statistically significant differences were found between the in-person and online groups. However, effect size estimates consistently favored the in-person format, especially in body, breath, and total self-efficacy; mind-related self-efficacy showed comparable results.

For the second research question, within-group comparison tests confirmed that both in-person and online yoga intervention contributed to significant pre-to-post gains in total yoga self-efficacy. Specifically, the in-person group showed significant improvement in body and total self-efficacy. The online group also demonstrated statistically significant changes in the breath and total subscales. The mind subscale did not show a statistically significant change in within-group improvements. The control group also showed a statistically significant change in the breath subscale, though the direction of change was a decline in self-efficacy. Overall, both statistical tests confirm that participation in hatha-based Iyengar yoga programs, particularly in-person formats, can significantly enhance individuals' self-efficacy in their body, breath, and total self-efficacy to engage in yoga.

The yoga studies look at different types of self-efficacy to see how yoga changes and how people think about their abilities in different areas, such as coping self-efficacy (Hirschey et al., 2020), pain self-efficacy (Adhikari et al., 2022), social self-efficacy, academic self-efficacy (Das et al., 2016), and self-regulatory efficacy (McAuley et al., 2011). The literature reveals diverse forms of self-efficacy associated with yoga practice and the impact that resulted. As can be seen, various self-efficacy scales are used in yoga studies, making comparisons across these scales challenging. This study specifically utilized the Yoga Self-Efficacy Scale (YSES), developed by Birdee et al. (2016).

Birdee et al. (2016) aim to measure individuals' confidence in their ability to practice yoga, focusing on the three key domains of body, breath, and mind. Yoga Self-Efficacy Scores are associated with improved health skills and an better quality of life. This would mean that they could be applied to research on yoga as a means of promoting healthy behavior. The study revealed that self-efficacy is a significant psychological factor that can facilitate individuals in maintaining and enjoying yoga practice.

Küçükelci (2018) adapted the YSES into Turkish, creating the Yoga Dönüşüm Etkisi Ölçeği-YDEÖ, while also confirming its validity and reliability. Her research, along

with the current study, highlights that practicing yoga regularly enhances self-efficacy in terms of body, breath, and mind.

Our findings showed that participants in the in-person yoga group experienced a more notable improvement in yoga self-efficacy, particularly in terms of body, breath, mind, and total score, compared to the online and control groups. This study is in line with Birdee et al.' (2016) methodology, in which they created and validated the Yoga Self Efficacy Scale (YSES) of perceived capability in controlling one's body, breath, and mind when practicing yoga, Birdee et al. (2016) found out that higher self-efficacy scores were associated with consistent practice, more health workers, experienced teachers and resultant improved health outcome. In a similar line, present research showed that students who practiced in person, where they could receive immediate feedback and hands-on guidance with group support, reported significantly greater improvements in their body-mind connection and overall self-efficacy. These results reinforce the notion that learning hatha-based-Iyengar yoga through in-person or online methods can significantly enhance confidence in skills such as controlling the body, mind, and breath. This emphasizes that future research should not only concentrate on the yoga intervention itself, but also on how and to whom it is provided, since these aspects may have a substantial impact on people's self-efficacy in participating in yoga.

5.1.8. Adherence to Yoga

For the follow-up assessment, participants from both in-person and online groups were asked a series of questions regarding their adherence to yoga practice one year after completing the intervention. At the one-year follow-up, adherence to yoga was significantly higher in the in-person group compared to the online group. While 70.6% of in-person participants continued to practice yoga (either regularly or occasionally), only 36.8% of the online group did so. A chi-square test confirmed a statistically significant association between the intervention program and adherence level, indicating that the in-person program was more effective in supporting long-term yoga practice.

This result supports previous studies, which have shown that in-person yoga helps people stay motivated and practice for longer (Gjestvang et al., 2025). Teacher presence, real-time feedback, and a sense of responsibility keep participants engaged. According to Self-Determination Theory, long-term motivation improves when people feel autonomous, capable, and connected (Deci & Ryan, 1980). In-person courses generally support these needs through interaction, feedback, and social support. Online programs, while more accessible, may lack these motivating features. Even with live feedback, the current study's lack of group connection and informal peer interaction may have limited adherence. Adding elements like online communities (e.g., online group meetings, discussion forums, chat groups, live question-and-answer sessions, and talk sessions) or peer support could improve engagement in online yoga.

5.2. Interpretation of The Quantitative Data Results

5.2.1. Perceived Effects of Yoga Practice

The findings of this research indicate that the practice of yoga primarily enhances physical benefits, including physical strength, flexibility, posture, endurance, agility, and reduced muscle and joint pain.

Results are consistent with previous studies that indicate regular yoga makes individuals more aware of their body and increases their physical capability. Kishida et al. (2018) state that it makes them stronger, and büssing et al. (2017) discovered that it benefits teenagers by enhancing their control and posture. Although this research does not directly address balance, different studies (Park et al., 2022; Jeitler et al., 2022) have demonstrated that it is a practical outcome that aids in balance, coordination, posture, and stability.

In this study, participants most frequently discussed the psychological benefits of yoga. These included feeling less stressed, calmer, more emotionally balanced, and more mentally clear. Many also said that yoga helped them become more aware of their thoughts and feelings and increased their self-confidence.

These results align with earlier studies that demonstrate the benefits of yoga in enhancing mental and emotional well-being. Research has shown that practicing yoga can help individuals feel calmer, less anxious, more focused, and better able to manage their emotions (Butzer et al., 2017; Capon et al., 2019; Jeitler et al., 2020; Wang & Hagins, 2016). It can also provide them the strength and control they need to deal with their emotions.

Most individuals described how yoga helped them increase their self-awareness of their body, breathing, and emotions. They could sense how their muscles functioned when holding poses. They paid particular attention to their breathing. Others noticed how they responded to issues or stress.

In yoga literature, studies also show that yoga improves self-awareness. It helps people connect their body and mind, calm themselves through breathing, and recognize bodily signals (Kahya & Raspin, 2017; Tul et al., 2011). Yoga also makes people more aware of their habits and emotions, especially in daily and social life (Capon et al., 2019; Kishida et al., 2018).

5.2.2. Challenges and Barriers to Yoga Practice

Many of the interview participants said that their physical health challenges made yoga hard. Some of these issues included painful muscles, soreness in the legs or lower back, and difficulty with certain poses due to stiffness. Many people also felt tired and had a low level of energy, especially on days when they were busy or stressed. Many of them also stated that they felt better after course and improved over time, despite having these problems. These experiences indicate that physical pain can be a barrier, but it can also be a part of the process of becoming used to something that often makes them stronger and more resilient.

The studies back up these results. Kahya and Raspin (2017) discovered that yoga initially made them tense, but breathing exercises helped them cope with it. Kishida et al. (2018) found that people had physical problems but learned how to take care of themselves by being conscious of their bodies. According to Jeitler et al. (2020) and

Butzer et al. (2017), they reported feeling sore at first, but that the discomfort improved with practice. Tul et al. (2011) also discovered that yoga helped persons with chronic pain deal with it better.

Many people in the current study report experiencing internal resistance during yoga sessions (emotional discomfort, self doubting, struggle to focus, etc.) It was hard for them to stay in the now, especially when trying to breathe or meditate. Emotions of self-criticism, insecurity, and embarrassment were common. Initially, these feelings made it more challenging to stay involved. Participants pointed out that with time to time, these challenges became more manageable.

Some studies have confirmed that the same set of problems arises. People reported feeling guilty or under pressure to keep up (Kahya & Raspin, 2017) or they faced difficulties related to their excessive sensitivity or perfectionism (Kishida et al., 2018). Some individuals felt shy and unsure, especially when being watched (Wang & Hagins, 2016), or became frustrated when they could not focus on meditation or breathing (Jeitler et al., 2020). Those who experienced internal resistance initially felt nervous, but gradually became more comfortable (Capon et al., 2019; Tul et al., 2011).

Participants reported setting-related issues during yoga. In-person participants noted a crowded, unventilated studio and a fear of touching others. Online users faced internet problems, screen freezing, and home distractions, though most of them felt more relaxed at home. Despite these issues, most adapted and continued attending sessions.

In other qualitative studies, similar issues were reported. Brosnan et al. (2021) and Sharma et al. (2022) discussed internet and camera issues experienced by participants during online yoga sessions. Spadola et al. (2017) found that crowded homes made it hard to focus; however, some felt safer at home. In studios, challenges included small, hot rooms and limited space (Capon et al., 2019; Kahya & Raspin, 2017).

5.2.3. Changing Views on Yoga

In this study, many participants began the yoga program with negative or limited ideas. Social media or TV shows might manipulate some of them. Common biases included seeing yoga as overly spiritual, elitist, or something only for flexible or wealthy people. Some associated yoga with religious or mystical ideas, while others doubted its physical challenge or practicality. However, after practicing regularly, many changed their minds. They realized that yoga could be physically challenging, yet calming, and beneficial for both their body and mind.

There have been numerous different opinions about yoga, as highlighted by various qualitative studies. For instance, Kahya and Raspin (2017) discovered that some individuals were doubtful about whether yoga offered anything beyond relaxation. According to Öznalbant and Alvarez (2020), some view yoga as merely a tourist activity, not suitable for everyone. Capon et al. (2019) and Tul et al. (2011) were uncertain about whether yoga can indeed assist in emotional or physical recovery. Van Ness et al. (2017) raised concerns about style or cultural aspects of yoga. Dariotis et al. (2017) found that city school students did not consider yoga important in their lives, suggesting there might be a greater gap somewhere.

In this study, many participants reported that they underestimated the physical demands of yoga. At first, they believed yoga was only for relaxation or flexibility. However, during the sessions, they realized that yoga also needs strength, flexibility, and endurance. Simple movements caused muscles to hurt, ache, and shake, particularly their arms, legs, and back. People initially were sad but later gained power and had greater control over their bodies. The findings indicate that individuals usually do not perceive yoga as challenging to their bodies, but over time, their muscles become accustomed and they become stronger.

Other studies show similar results. In Kahya and Raspin (2017), participants were surprised that yoga required effort and caused tiredness. Tul et al. (2011) also reported that participants with chronic pain did not expect to feel such physical sensations in yoga. Dariotis et al. (2017) found that students initially thought yoga was merely stretching, but later realized it required real physical effort. Capon et al. (2019) reported that some individuals experienced soreness and strain after practice, which

altered their perception of yoga. These studies support the idea that people often underestimate the physical part of yoga, especially at the beginning.

5.2.4. Implementation Perception of Yoga Intervention

The program preferences among program gatherded from participants were mentioned in this section. Those who were part of the online group appreciated the comfort and convenience, particularly if they had busy schedules or transportation issues. On the other hand, many preferred in-person sessions for the personal connection and the support of a group. Despite facing some technological challenges and distractions at home, many participants managed to stick with their training.

Research and participants have noted that there are distinct advantages and disadvantages to practicing yoga online versus in-person traditional yoga. Participants enjoy attending yoga courses because they provide an acceptance that inspires them, immediate feedback from instructors, and a calm atmosphere that allows them to move and feel improved (Brinsley et al., 2021; McCall et al., 2015; Nicosia et al., 2020). That being said, attending classes can be challenging for individuals who have mobility issues, chronic illnesses, or transportation difficulties, and time and cost issues can also be problematic (Huberty et al., 2018).

On the other hand, online yoga offers a simpler and more convenient way for people to practice. Time availability and the comfort of practising at home are mentioned. (Brinsley et al., 2021; Huberty et al., 2017). This is especially beneficial for those dealing with chronic illnesses, work-related stress, or those who live far from yoga studios (Robert et al., 2023). While there are certainly some disadvantages to consider, such as the lack of hands-on guidance, potential technical problems, and fewer opportunities to connect with others (Haynes et al., 2022; Sharma et al., 2022), these factors can impact the experience, enjoyment, and emotional connections formed during yoga practice.

According to scheduling preferences, most people thought the program's length and frequency were generally good. Two sessions a week were considered manageable and

not too difficult to attend. Some people, meanwhile, said that the eight-week length felt short and that a lengthier program could be better for their bodies and minds. Some comments suggest that practicing yoga two to three times a week would be beneficial for maintaining what you have learned and staying physically active.

These results support the research findings, which indicate that having regular and balanced sessions promotes engagement and makes people feel like they are getting more out of them (Spadola et al., 2017; Tsai et al., 2021). Some participants also said that having some basic information or theoretical content about yoga before the sessions would help them be more aware of what they were doing. This finding aligns with other research indicating that providing individuals with knowledge prior to the intervention may increase their motivation and likelihood of adherence (Cramer et al., 2015; Bhargav, 2018).

5.3. Interpretation of The Mixed Data Results

The integration of quantitative and qualitative findings demonstrates that hatha-based Iyengar yoga supported improvements in various physical fitness parameters. However, the level and type of these improvements varied depending on whether the practice was conducted in-person or online. Quantitative results revealed that both groups demonstrated significant improvements in muscular strength and flexibility. Specifically, the online group showed greater improvement in core strength and lower body flexibility. However, the in-person group showed greater improvement in upper-body flexibility and muscular strength. Participants' interview replies matched these results: they reported feeling stronger, more agile, with better posture, and with less physical discomfort. In terms of balance, the intervention group showed improvement in certain circumstances, especially in the eyes-closed condition. This may reflect improvements in body awareness, even though participants spoke more frequently about enhanced bodily perception than balance itself.

Unexpectedly, body composition results revealed that BMI and fat percentage increased among all groups, including the intervention group. This may be a result of the short duration of the intervention and the lack of control over eating habits, as

several participants also admitted to having poor eating habits. Still, many said yoga was physically demanding and transformed the body. Hatha-based Iyengar yoga has been shown to have a profound physical impact, even when practiced online.

The integrative results from both the quantitative and qualitative data indicate that practicing hatha-based Iyengar yoga had a positive effect on participants' psychological well-being and their overall sense of health. According to the quantitative results, both the in-person and online yoga groups experienced an apparent reduction in their stress levels, whereas the control group showed no change. Many participants in the interviews reported yoga made them feel calmer, clear-headed, and emotionally balanced. Some said they could better control their emotions and were more conscious of their responses under trying circumstances. However, some of them stated that advantages were felt during or shortly after the session, rather than over an extended period. When it comes to perceived health, participants in the yoga groups reported feeling healthier after the program compared to the control group. However, upon examining the actual change from the beginning to the end of the program, we found no significant difference between the groups. This might suggest that yoga made participants feel better about their current state of health, but it was not enough time to significantly change their general perspective of health. The interviews confirmed this as well; several participants reported that yoga helped them feel better both physically and mentally. Still, since many of them were young, it is possible that they viewed health more broadly or more straightforwardly. Overall, the positive effects on stress and perceived health suggest that yoga is not just something that helps people relax for a moment, but also helps them feel stronger mentally and emotionally, and gain a deeper understanding of themselves.

The integration of quantitative findings based on the Yoga Self-Efficacy Scale and qualitative findings from interviews revealed that the strongest and most consistent improvements were observed in the body subscale. Both the statistical results and participant interviews confirmed that most individuals felt more in control of their bodies during yoga. They reported more strength and flexibility in their bodies, moving more smoothly, and staying stable in poses. In the breath subscale, quantitative scores were significant, especially in the in-person group. Interviews revealed different experiences. Although some participants reported increased awareness of their breath,

others remained unable to remain calm or attentive while controlling their breathing. The subscale of mind revealed the weakest and most inconsistent findings. Various conclusions were drawn: significant differences were revealed between groups, with a large effect size, but no significant change was observed within groups. Interview data revealed this confusion. Although participants occasionally felt mentally clearer or calmer during practice, some said these effects were temporary. Many found it challenging to maintain their attention or refocus when distracted. This shows that the duration and intensity of the hatha-based Iyengar yoga intervention were enough to improve yoga self-efficacy in the body and breath subscales. However, the duration and intensity may not have been sufficient to affect more internal and subtle areas, such as mindfulness and mind–breath integration. For more profound and more lasting mental changes, a longer yoga program is recommended.

The integration of adherence data with personal, emotional, and environmental barriers, as well as self-confidence levels, provides a clearer understanding of why many participants, particularly in the online group, did not maintain long-term yoga practice. Although 70.6% of in-person participants continued practicing yoga one year after the intervention, only 36.8% of the online group did so. A key factor appears to be motivation; "lack of motivation" was the most reported emotional barrier across all groups (92.98%) and affected the intervention group similarly. However, the in-person group reported higher levels of low or very low self-confidence, which may have been improved through real-time feedback and group support during the program, contributing to better long-term adherence. Conversely, while most online participants reported moderate to very high self-confidence, they also reported more environmental and personal barriers, including a lack of goal-setting (37.5%) and limited access to supportive social groups or sports facilities. These conditions may have made it more challenging for them to continue practicing after the structured program ended. Overall, these findings suggest that, although self-efficacy may be increased during an intervention, long-term yoga practice depends on motivation, environmental and social support, and the ability to overcome practical barriers. These results challenge the notion that improvements in yoga self-efficacy are sufficient to sustain long-term practice. They suggest that stronger, more social, and longer programs are needed to help people keep practicing yoga.

5.3. Suggestions for Future Research

This study examines the effects of an eight-week hatha-based Iyengar yoga program on young adult women. Based on the findings, several suggestions can be made for future research:

- The yoga program in this study lasted only eight weeks. However, this short period may not be enough for some physical and psychological changes to happen. Future studies should utilize longer programs to observe the long-term effects of yoga more effectively.
- The group consisted solely of young adult women. To enhance the generalizability of the results, future research should incorporate more diverse and larger groups regarding age, gender, occupation, and social background.
- While the measurement tools used in this study were reliable, some of the results relied on self-reporting. Future studies should incorporate objective measures, such as heart rate variability or cortisol levels, to more accurately evaluate stress.
- Only the intervention group was followed up one year later. Including the control group in long-term follow-ups can help us better compare the lasting effects of yoga. Additionally, we recommend offering the control group the same yoga program after the study concludes for ethical reasons. This can also enhance participant satisfaction and help spread the benefits of the program.
- Some participants indicated that receiving basic information before starting the classes would be helpful. Future programs are recommended to include brief theoretical content on yoga philosophy, health, or diet.
- More detailed research is needed to understand how yoga provides its benefits—whether through breathing, mindfulness, yoga poses, teacher support, or group dynamics support.
- Future research might include yoga intervention and other health-related subjects, such as healthy habits or stress management. This may have a particularly significant impact, especially on young individuals.

- In this research, online participants showed reduced adherence. This suggests that future studies should explore ways to boost motivation in online programs. Ideas such as online community meetings, discussion groups, live feedback, or talk sessions should be considered.
- This study focused solely on hatha-based Iyengar yoga. Future research may compare different yoga styles, such as Hatha, Vinyasa, or Yin, across various target groups. These comparisons could reveal which styles are more effective in specific contexts, which could benefit both practitioners and researchers.

REFERENCES

Abbasi, M., Sadeghi, H., & Hosseinzadeh, M. (2021). The relationship between yoga, physical activity, and self-care in health promotion. Journal of Complementary and Integrative Medicine, 18(1), 45-56. Tezimde yok

Adams, K., McKinney, C. H., & Zane, T. (2019). The effect of yoga on health outcomes. Complementary Therapies in Clinical Practice, 35, 19-25. Böyle bi çalışma yok

Adhikari, B., Starkweather, A., Xu, W., Acabchuk, R. L., Ramesh, D., Eze, B., Yang, Y., Yang, G. S., Walker, J., Laubenbacher, R., & Park, C. L. (2022). A feasibility study on yoga's mechanism of action for chronic low back pain: psychological and neurophysiological changes, including global gene expression and DNA methylation, following a yoga intervention for chronic low back pain. Pilot and feasibility studies, 8(1), 142.

Advisory on Tele Yoga (2020), (2023, August 18)

Agormedah, E. K., Henaku, E., Ayite, D. M. K., & Ansah, E. A. (2020). Online Learning in Higher Education During COVID-19 Pandemic: A Case of Ghana. Journal of Educational Technology and Online Learning.

Ahmed, H. (2010). Hybrid e-learning acceptance model: learner perceptions. Decision Sciences Journal of Innovative Education, 8(2), 313-346.

Ahmed, T. (2010). Blended learning as an instructional approach. International Journal of Instructional Technology and Distance Learning, 7(3), 17-26.

Aji, R. E., & Ardin, S. (2020). Challenges in implementing hybrid learning. Jurnal Pendidikan, 10(2), 80-90.

Akdeniz, Ş., Kaştan, Ö. Perceived benefit of yoga among adults who have practiced yoga for a long time: a qualitative study. BioPsychoSocial Med 17, 19 (2023).

Alexander, G. K., Rollins, K., Walker, D., Wong, L., & Pennings, J. (2015). Yoga for self-care and burnout prevention among nurses. Workplace Health & Safety, 63(10), 462-470.

Ali, M. (2010). Eight Limbs of Yoga: An Overview. Journal of Yoga Studies, 2(1), 23-35.

Aliazas, J., Galang, J., & Velasquez, C. (2021). Technology integration and teaching practices amid COVID-19 pandemic. Asian Journal of Education, 11(1), 50-60.

Almutary, H., & Tayyib, N. (2021). Evaluating self-efficacy among patients undergoing dialysis therapy. Nursing Reports, 11(1), 195-201.

AlphayogaschoolAdmin. (2024, December 9). Mirror technique of demonstrating an Asana | Alpha Yoga School. Alpha Yoga School.

Amin, D. J., & Goodman, M. (2014). The effects of selected asanas in Iyengar yoga on flexibility: Pilot study. Journal of bodywork and movement therapies, 18(3), 399-404.

Armstrong, K. (2023). The historical evolution of yoga. Journal of Eastern Philosophies, 8(1), 19-34.

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. American Psychologist, 55(5), 469–480. PMID: 10842426.

Atchison, K. A., & Gift, H. C. (1997). Perceived health and oral health behaviors. Journal of Public Health Dentistry, 57(4), 204-210.

Atkinson, G., & Nevill, A. M. (1998). Statistical methods for assessing measurement error (reliability) in variables relevant to sports medicine. Sports medicine (Auckland, N.Z.), 26(4), 217–238.

Avery, T., Schulz-Heik, R., Friedman, M., Mahoney, L., Ahmed, N., & Bayley, P. (2021). Clinical yoga program utilization in a large health care system.. Psychological Services, 18(3), 389-397.

Ayhan, A. S., Aktan, Z. D., & Tamay, Z. Ü. (2023). Mindfulness in the relationship between perceived stress and quality of life in pediatric asthma. Journal of Child, 23(1), 27–34.

Baghel, P. (2021). A survey on effectiveness of b. k.s. iyengar yoga plan for cold. Journal of Pharmaceutical Research International, 43-49.

Bai, Z., Shu, T., & Niu, W. (2019). Test-retest reliability and measurement errors of grip strength test in patients with traumatic injuries in the upper extremity: a cross-sectional study. BMC musculoskeletal disorders, 20(1), 256.

Bal, B. S., & Kaur, P. J. (2009). Effects of selected asanas in hatha yoga on agility and flexibility level. J Sport Health Res, 1(2), 75-87.

Balasubramaniam, M., Telles, S., & Doraiswamy, P. (2013). Yoga on our minds: a systematic review of yoga for neuropsychiatric disorders. Frontiers in Psychiatry, 3. https://doi. Riley & Park org/10.3389/fpsyt.2012.00117

Baltag, O., Apostu, M., El-Bsat, R., & Predescu, C. (2024). Study regarding the muscle strength after breast cancer surgery. Series IX Sciences of Human Kinetics, 225-232.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191–215.

Bandura, A. (1986). Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). Self-Efficacy: The Exercise of Control. W. H. Freeman.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52, 1–26.

Bandura, A. (2004). Health promotion by social cognitive means. Health Education & Behavior, 31(2), 143–164

Bandura, A. (2005). The evolution of social cognitive theory. In K. G. Smith & M. A. Hitt (Eds.), Great Minds in Management: The Process of Theory Development (pp. 9–35). Oxford University Press.

Bandy, W. D., Irion, J. M., & Briggler, M. (1997). The effect of time and frequency of static stretching on flexibility of the hamstring muscles. Physical therapy, 77(10), 1090–1096.

Bansal, R., Gupta, M., Agarwal, B., & Sharma, V. (2013). Impact of short-term yoga intervention on mental well-being of medical students posted in community medicine: A pilot study. Indian Journal of Community Medicine, 38(2), 105–108.

Bartos, A., Knapik, A., & Saulicz, E. (2022). Effectiveness of yoga vs exercise on fall risk in older adults. BMC Geriatrics, 22(1), 56–63.

Barut, C., & Demirel, P. (2012). Influence of testing posture and elbow position on grip strength. Med J Islamic World Acad Sci, 20(3), 94-97.

Basir, F., Fata, S., & Mohtasham, H. (2020). Relationship between physical fitness and academic achievement. *Journal of Physical Education and Sport*, 20(5), 2645–2649.

Batrakoulis, A. (2022). Yoga as a treatment in obesity management. Journal of Obesity & Metabolic Syndrome, 31(2), 132–145.

Behmer, S. (2019). Community in group yoga classes. Yoga Journal of Practice, 27(1), 14–18.

Berlowitz, I., Pullen, P. R., Edwards, L. V., & Pullen, C. H. (2020). Yoga for stress management in caregivers of patients with cancer: A review of the literature. Holistic Nursing Practice, 34(4), 214–222.

Berlowitz, J., Hall, D. L., Joyce, C., Fredman, L., Sherman, K. J., Saper, R. B., & Roseen, E. J. (2020). Changes in Perceived Stress After Yoga, Physical Therapy, and Education Interventions for Chronic Low Back Pain: A Secondary Analysis of a Randomized Controlled Trial. Pain medicine (Malden, Mass.), 21(10), 2529–2537.

Bernard, R. M., Abrami, P. C., Lou, Y., & Borokhovski, E. (2009). A meta-analysis of distance education. Review of Educational Research, 79(3), 1243–1289.

Bhavanani, A. (2009). Yoga in the Bhagavad Gita. Indian Journal of Yoga, 3(1), 15–22.

Bhavanani, A. (2018). Yoga and skill in action. International Journal of Yoga, 11(1), 1–5.

Bhavsar, S., & Jindani, F. (2015). Kundalini yoga for PTSD. Journal of Trauma Rehabilitation, 32(4), 285–294.

Bhonde, M. S., Bagade, A. H., & Dhanavijay, A. D. (2014). Effect of suryanamaskar on handgrip strength in healthy volunteers in the age group of 20–40 years. Int J Recent Trends Sci Technol, 12(2), 236-8.

Bhowmik Bhunia, G., & Ray, U. S. (2024). Improvement in muscular strength, body flexibility and balance by yogasana and with reduced detraining effects by yoga breathing maneuvers: A non-randomized controlled study. Journal of Ayurveda and integrative medicine, 15(1), 100815. https://doi.org/10.1016/j.jaim.2023.100815 (, 2021)

Bhuniya, A., et al. (2023). Effects of yoga training in soccer players. Sports Science Review, 32(1), 75–88.

Bianco, A., Lupo, C., Alesi, M., Spina, S., Raccuglia, M., Thomas, E., Paoli, A., & Palma, A. (2015). The sit up test to exhaustion as a test for muscular endurance evaluation. SpringerPlus, 4, 309.

Birdee, G. S., et al. (2008). Characteristics of yoga users. Journal of General Internal Medicine, 23(10), 1653–1658.

Birdee, G. S., et al. (2015). Yoga and self-efficacy. Complementary Therapies in Medicine, 23(2), 227–234.

Birdee, G. S., Sohl, S. J., & Wallston, K. A. (2016). Development and psychometric properties of the Yoga Self-Efficacy Scale (YSES). BMC Complementary and Alternative Medicine, 16, Article 3.

Birdee, G.S., Ayala, S.G. & Wallston, K.A. Cross-sectional analysis of health-related quality of life and elements of yoga practice. BMC Complement Altern Med 17, 83 (2017).

Bishal Gnyawali. (2019). Vedas and Yoga Philosophy. International Journal of Indic Studies, 6(2), 112–120.

Biswas, S., et al. (2022). Patanjali Yoga Sutras in practice. Journal of Indian Philosophy and Religion, 28(2), 45–60.

Bohannon, R. W. (2008). Hand-grip dynamometry predicts future outcomes in aging adults. Journal of Geriatric Physical Therapy, 31(1), 3–10.

Borodulin, K., Sipilä, N., Rahkonen, O., Leino-Arjas, P., Kestilä, L., Jousilahti, P., & Prättälä, R. (2016). Socio-demographic and behavioral variation in barriers to leisure-time physical activity. Scandinavian journal of public health, 44(1), 62-69.

Bower, J. E., et al. (2011). Iyengar yoga for breast cancer survivors. Psycho-Oncology, 20(10), 1185–1194.

Braun, V. and Clarke, V. (2013) Successful Qualitative Research: A Practical Guide for Beginners. SAGE Publication, London.

Bredin, S. S., Gledhill, N., Jamnik, V. K., & Warburton, D. E. (2013). PAR-Q+ and ePARmed-X+: new risk stratification and physical activity clearance strategy for physicians and patients alike. Canadian family physician Medecin de famille canadien, 59(3), 273–277.

Brill, P. A., Macera, C. A., Davis, D. R., Blair, S. N., & Gordon, N. (2000). Muscular strength and physical function. Medicine and science in sports and exercise, 32(2), 412–416.

Brinsley, J., et al. (2021). In-person yoga classes: Health and community impact. Journal of Bodywork & Movement Therapies, 25(1), 134–140.

Brinsley, J., Smout, M., & Davison, K. (2021). Satisfaction with online versus in-person yoga during COVID-19. The Journal of Alternative and Complementary Medicine, 27(10), 893-896.

Brinsley, J., Smout, M., & Davison, K. (2021). Satisfaction with Online Versus In-Person Yoga During COVID-19. Journal of alternative and complementary medicine (New York, N.Y.), 27(10), 893–896.

Brosnan, P., Nauphal, M., & Tompson, M. C. (2021). Acceptability and feasibility of the online delivery of hatha yoga: A systematic review of the literature. Complementary therapies in medicine, 60, 102742.

Bucchianeri, M. M., Arikian, A. J., Hannan, P. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Body dissatisfaction from adolescence to young adulthood: findings from a 10-year longitudinal study. Body image, 10(1), 1–7.

Büssing, A. and Beerenbrock, Y. (2021). Ethical principles of yoga philosophy in western yoga practitioners: validation of the yama/niyama questionnaire. Complementary Medicine Research, 28(4), 325-335.

Büssing, A., Khalsa, S. B., Michalsen, A., Sherman, K. J., & Telles, S. (2012a). Yoga as a therapeutic intervention. Evidence-based complementary and alternative medicine : eCAM, 2012, 174291.

Büssing, A., Michalsen, A., Khalsa, S. B., Telles, S., & Sherman, K. J. (2012b). Effects of yoga on mental and physical health: a short summary of reviews. Evidence-based complementary and alternative medicine : eCAM, 2012, 165410.

Butzer, B., LoRusso, A. M., Windsor, R., Riley, F., Frame, K., Khalsa, S. B. S., & Conboy, L. (2017). A qualitative examination of yoga for middle school adolescents. Advances in school mental health promotion, 10(3), 195-219.

Callow, D. D., Arnold-Nedimala, N. A., Jordan, L. S., Pena, G. S., Won, J., Woodard, J. L., & Smith, J. C. (2020). The Mental Health Benefits of Physical Activity in Older Adults Survive the COVID-19 Pandemic. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry, 28(10), 1046–1057. https://doi.org/10.1016/j.jagp.2020.06.024Callow et al., 2020

Campbell, D. T., & Riecken, H. W. (1968). Quasi-experimental design. International encyclopedia of the social sciences, 5(3), 259-263.

Campbell, V., & Nolan, M. (2019). 'It definitely made a difference': A grounded theory study of yoga for pregnancy and women's self-efficacy for labour. Midwifery, 68, 74–83.

Capela Santos, D., Jaconiano, S., Macedo, S., Ribeiro, F., Ponte, S., Soares, P., & Boaventura, P. (2023). Yoga for COVID-19: An ancient practice for a new condition - A literature review. Complementary therapies in clinical practice, 50, 101717.

Capon, H., O'Shea, M., & McIver, S. (2019). Yoga and mental health: A synthesis of qualitative findings. Complementary Therapies in Clinical Practice, 37, 122-132.

Carbonell-Baeza, A., Aparicio, V. A., Ortega, F. B., Cuevas, A. M., Alvarez, I. C., Ruiz, J. R., & Delgado-Fernandez, M. (2011). Does a 3-month multidisciplinary intervention improve pain, body composition and physical fitness in women with fibromyalgia?. British journal of sports medicine, 45(15), 1189–1195.

Cartwright, T., Mason, H., Porter, A. L., & Pilkington, K. (2020). Yoga practice in the uk: a cross-sectional survey of motivation, health benefits and behaviours. BMJ Open, 10(1), e031848.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. Public Health Reports, 100(2), 126–131.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public health reports (Washington, D.C. : 1974), 100(2), 126–131.

Castro-Piñero, J., Chillón, P., Ortega, F. B., Montesinos, J. L., Sjöström, M., & Ruiz, J. R. (2009). Criterion-related validity of sit-and-reach and modified sit-and-reach test for estimating hamstring flexibility in children and adolescents aged 6–17 years. International Journal of Sports Medicine, 30(9), 658–662.

Cerin, E., Leslie, E., Sugiyama, T., & Owen, N. (2010). Perceived barriers to leisure-time physical activity in adults: an ecological perspective. Journal of physical activity and health, 7(4), 451-459.

Çetinoğlu, G., & Pehlivan, E. (2024). The effect of yoga practices on health parameters: A review. Turkish Journal of Kinesiology, 10(1), 41-47.

Chana, S. L. (2025). Essential Yoga With Props: Enhance Every Pose for Full-Body Mobility and Flexibility. Meyer & Meyer Sport.

Chen, T. L., Mao, H. C., Lai, C. H., Lai, C. H., Li, C. Y., Kuo, C.-H., & Kuo, C.-H. (2009). The effect of yoga exercise intervention on health related physical fitness in school-age asthmatic children. The Journal of Nursing (China), 56(2), 42–52.

Choudhary, N., Gopal, K., Naqvi, W., Kandakurti, P. K., & Hazari, A. (2024). Relationship between the level of physical activity and body mass index to blood pressure among overweight and obese young adults in the Northern Emirates city: A cross-sectional study. PloS one, 19(6), e0304360.

Chrousos, G. Stress and disorders of the stress system. Nat Rev Endocrinol 5, 374–381 (2009)

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, S., Janicki-Deverts, D., Doyle, W., Miller, G., Frank, E., Rabin, B., … & Turner, R. (2012). Chronic stress, glucocorticoid receptor resistance, inflammation, and disease risk. Proceedings of the National Academy of Sciences, 109(16), 5995-5999.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24(4), 385–396.

Colgrove, Y. M., Sharma, N., & Kluding, P. (2012). Effect of yoga on heart rate variability and depressive symptoms in women: A randomized controlled trial. Journal of Alternative and Complementary Medicine, 18(8), 766–772.

Colgrove, Y. S., Sharma, N., Kluding, P. M., Potter, D., Imming, K., VandeHoef, J., … & White, K. (2012). Effect of yoga on motor function in people with parkinson's disease: a randomized, controlled pilot study. Journal of Yoga &Amp; Physical Therapy, 02(02).

Cowen, V. S., & Adams, T. B. (2005). Physical and perceptual benefits of yoga asana practice: results of a pilot study. Journal of Bodywork and Movement Therapies, 9(3), 211-219.

Cramer, H., Langhorst, J., Dobos, G., & Lauche, R. (2015). Associated factors and consequences of risk of bias in randomized controlled trials of yoga: a systematic review. PLoS One, 10(12), e0144125.

Cramer, H., Lauche, R., Langhorst, J., & Dobos, G. (2013). Yoga for depression: a systematic review and meta-analysis. Depression and Anxiety, 30(11), 1068-1083.

Cramer, H., Lauche, R., Langhorst, J., & Dobos, G. (2014). Comparison groups in yoga research: A systematic review and critical evaluation of randomized controlled trials. Complementary Therapies in Medicine, 22(5), 920–929.

Creswell, J. W. (2013). Qualitative Inquiry & Research Design: Choosing among Five Approaches (3rd ed.). Thousand Oaks, CA: SAGE.

Csala, B., Ferentzi, E., Beissner, F., Drew, R., & Köteles, F. (2020). Verbal cuing is not the path to enlightenment. psychological effects of a 10-session hatha yoga practice. Frontiers in Psychology, 11.

Csala, B., Molnár, G., & Tóth, K. (2021). The impact of yoga practice on BMI and body fat percentage among young adults. Health & Fitness Journal, 19(3), 66–72.

Csala, B., Szemerszky, R., Körmendi, J., Köteles, F., & Boros, S. (2021). Is weekly frequency of yoga practice sufficient? Physiological effects of hatha yoga among healthy novice women. Frontiers in public health, 9, 702793.

Csala, B., Váczi, M., & Trzaskoma, Z. (2021). The Back Scratch Test: Reference Values for Young Adults and Correlations with Shoulder Rotation Range of Motion. Journal of Human Kinetics, 79, 191–200.

Cutri, R. and Mena, J. (2020). A critical reconceptualization of faculty readiness for online teaching. Distance Education, 41(3), 361-380.

Da Silva, T. L., Gomes, F., & Reis, R. (2019). Body composition and posture: Implications for yoga practice. Journal of Yoga and Physical Therapy, 9(2), 255.

Damaske, S., Zawadzki, M., & Smyth, J. (2016). Stress at work: differential experiences of high versus low ses workers. Social Science & Medicine, 156, 125-133.

Danhauer, S., Addington, E., Sohl, S., Chaoul, A., & Cohen, L. (2017). Review of yoga therapy during cancer treatment. Supportive Care in Cancer, 25(4), 1357-1372.

Dariotis, J. K., Mirabal-Beltran, R., Cluxton-Keller, F., Feagans Gould, L., Greenberg, M. T., & Mendelson, T. (2017). A qualitative exploration of implementation factors in a school-based mindfulness and yoga program: Lessons learned from students and teachers. Psychology in the Schools, 54(1), 53-69.

Das, M., Deepeshwar, S., Subramanya, P., & Manjunath, N. (2016). Influence of yoga-based personality development program on psychomotor performance and self-efficacy in school children. Frontiers in Pediatrics, 4.

Dasgupta, A. (2018). Mentor's involvement in student's growth: teacher - student relationship, a practice of 5000 years in effect to 21st century. Literacy Information and Computer Education Journal, 9(4), 3058-3066.

Dash, M., & Telles, S. (2001). Improvement in hand grip strength in normal volunteers and rheumatoid arthritis patients following yoga training. Indian journal of physiology and pharmacology, 45(3), 355-360.

Dayananda, H. V., Ilavarasu, J. V., Rajesh, S. K., & Babu, N. (2014). Barriers in the path of yoga practice: An online survey. International Journal of Yoga, 7(1), 66-71.

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. Advances in Experimental Social Psychology, 13, 39–80.

Demir, Y., Oruç, P., Aydın Kılınç, Z., Özpınar, S. (2021). The Perceived Stress And Its Effects on Satisfaction With Life: Emergency Department Staff During Covid-19 Pandemic. Fenerbahçe University Journal of Health Sciences, 1(3), 256-268.

Demirtaş, A. S., Aktan, Z. D., & Tamay, Z. Ü. (2023). Mindfulness in the relationship between perceived stress and quality of life in pediatric asthma. Journal of Child, 23(1), 27–34.

Dhawan S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. Journal of Educational Technology Systems, 49(1), 5–22.

Diener, M.H. (1992). The validity and reliability of a 1-minute half sit-ups test. Medicine and Science in Sports and Exercise, 24.

Dishman, R. K., Heath, G. W., & Lee, I-M. (2013). Physical activity epidemiology (2nd ed.). Human Kinetics.

Divya Sivaramakrishnan, Claire Fitzsimons, Paul Kelly, Kim Ludwig, Nanette Mutrie, David Saunders, & Ruth Jepson. (2019). The Effects of Yoga Compared to Active and Inactive Controls on Physical Function and Health-Related Quality of Life in Older Adults- Systematic Review and Meta-Analysis of Randomised Controlled Trials. International Journal of Behavioral Nutrition and Physical Activity. doi: 10.4103/jfmpc.jfmpc_1837_21

Domingues, R. and Carmo, C. (2019). Disordered eating behaviours and correlates in yoga practitioners: a systematic review. Eating and Weight Disorders - Studies on Anorexia Bulimia and Obesity, 24(6), 1015-1024.

Douglah, J. (2020). “Use the mirror now”–Demonstrating through a mirror in show dance classes. Multimodal Communication, 9(2), 20200002.

Dwi, F., Suprapto, N., & Supardi, Z. (2023). Implementation of hybrid learning and its impacts at a public junior school in indonesia. Studies in Learning and Teaching, 3(3), 170-179.

Edited by Gavin Flood. (2003). The Blackwell companion to Hinduism. Malden, MA :Blackwell Pub

Elgohary, H. M., Elshafey, M. A., & Abd El Kafy, E. M. (2019). Validity and reliability of the single leg stance test in children with spastic cerebral palsy. Journal of Musculoskeletal Research, 22(2), 1950006.

Erengin H, Dedeoğlu N. An easy way of measuring health: Perceived Health. Toplum Hekim 1997;12:11-6.

Erengin H, Dedeoğlu N. Sağlığı ölçmenin kolay bir yolu algılanan sağlık. Toplum ve Hekim Dergisi. 1997;12(77):11-6.

Erkin Ö, Akçay N. Self-perceived health status and yoga-related perceptions among yoga practitioner. Turk J Fam Med Prime Care. 2018;12(3):193-199.

Erkin, Ö., & Akçay, N. (2018). Self-Perceived Health Status and Yoga-Related Perceptions among Yoga Practitioner. Turkish journal of family medicine and primary care, 12, 193-199.

Ertaş, H., DEMİR, R., Kiraç, F., & Kiraç, R. (2022). Examination of the relationship between patient empowerment and self-efficacy. Journal of Academic Perspective on Social Studies, (1), 1-10.

Ertekin, Y. H. (2018). Turkish adaptation of the Physical Activity Readiness Questionare for Everyone (PAR-Q+). Family Practice and Palliative Care, 3(1), 52-64.

Eskin, M., Harlak, H., Demirkıran, F., & Dereboy, Ç. (2013). Algılanan stres ölçeğinin Türkçeye uyarlanması: güvenirlik ve geçerlik analizi. New/Yeni Symposium Journal, 51(3), 132-140.

Evans, S., Sternlieb, B., Zeltzer, L., & Tsao, J. (2013). Iyengar yoga and the use of props for pediatric chronic pain: a case study. Alternative therapies in health and medicine, 19(5), 66–70.

Eyuboglu, F., Inal-Ince, D., Karamancioglu, B., Vardar-Yagli, N., Kaya-Utlu, D., Dalkilic, O., & Somay, G. (2023). Effect of tele-yoga on aerobic capacity, respiratory muscle strength, and cognitive performance in patients with obstructive sleep apnea syndrome. Heart & Lung, 62, 157-167.

Fábián, M., Huszti, I., Bárány, E., & Lechner, I. (2022). Distance language learning as school learners perceive it. Vìsnik Knlu Serìâ “Psihologìâ Ta Pedagogìka” / Visnyk Knlu Series Pedagogy and Psychology, 35, 31-42.

Feuerstein, G. (2008). The deeper dimension of yoga: Theory and practice. Shambhala Publications.

Feuerstein, Georg (2001). The Yoga Tradition: Its History, Literature, Philosophy and Practice (3rd edition). Prescott, Ariz. : Hohm Press, 2008.

Field, T. (2011). Yoga clinical research review. Complementary Therapies in Clinical Practice, 17(1), 1–8.

Fischer, J., Kandil, F., Kessler, C., Nayeri, L., Zager, L., Hennhöfer, T., … & Jeitler, M. (2022). Stress reduction by yoga versus mindfulness training in adults suffering from distress: a three-armed randomized controlled trial including qualitative interviews (relax study). Journal of Clinical Medicine, 11(19), 5680.

Foley, M. P., & Hasson, S. M. (2016). Effects of a community-based multimodal exercise program on health-related physical fitness and physical function in breast cancer survivors: a pilot study. Integrative Cancer Therapies, 15(4), 446-454

Foley, M. P., & Hasson, S. M. (2016). Effects of a community-based multimodal exercise program on health-related physical fitness and physical function in older adults: A pilot study. Journal of Aging and Physical Activity, 24(2), 268–275.

Fox, N. S., Brennan, J. S., & Chasen, S. T. (2008). Clinical estimation of fetal weight and the Hawthorne effect. European Journal of Obstetrics & Gynecology and Reproductive Biology, 141 (2), 111-114.

Frank, L. B., & Larimore, R. (2015). The use of yoga in treating symptoms of multiple sclerosis: A systematic review. Frontiers in Neuroscience, 9, 133.

Fuchs, K. (2021). The online teaching survival guide: simple and practical pedagogical tips. American Journal of Qualitative Research, 5(1), 294-297.

G.S., Ayala, S.G. & Wallston, K.A. Cross-sectional analysis of health-related quality of life and elements of yoga practice. BMC Complement Altern Med 17, 83 (2017).

Gaerlan, M. G., Alpert, P. T., Cross, C., Louis, M., & Kowalski, S. (2012). Postural balance in young adults: The role of visual, vestibular, and somatosensory systems. Journal of the American Academy of Nurse Practitioners, 24(6), 375–381.

García-Hermoso, A., Cavero-Redondo, I., Ramírez-Vélez, R., Ruiz, J. R., Ortega, F. B., Lee, D. C., & Martínez-Vizcaíno, V. (2018). Muscular Strength as a Predictor of All-Cause Mortality in an Apparently Healthy Population: A Systematic Review and Meta-Analysis of Data From Approximately 2 Million Men and Women. Archives of physical medicine and rehabilitation, 99(10), 2100–2113.e5.

Gard, T., Brach, N., Hölzel, B., Noggle, J., Conboy, L., & Lazar, S. (2012). Effects of a yoga-based intervention for young adults on quality of life and perceived stress: the potential mediating roles of mindfulness and self-compassion. The Journal of Positive Psychology, 7(3), 165-175.

Gauchard, G. C., Jeandel, C., Tessier, A., & Perrin, P. P. (1999). Beneficial effect of proprioceptive physical activities on balance control in elderly human subjects. Neuroscience letters, 273(2), 81–84.

Gavilán-Carrera, B., Segura-Jiménez, V., Estévez-López, F., Álvarez-Gallardo, I. C., Soriano-Maldonado, A., Borges-Cosic, M., ... & Delgado-Fernández, M. (2019). Physical fitness is associated with pain in women with fibromyalgia: The al-Ándalus project. Rheumatology International, 39(5), 845–854.

Geeta S. Iyengar (2000), Preliminary Course (For Beginners) (Yoga In Action) by Spiral-bound, YOG Publisher, Mumbai India,

Gharote, M.L., & Ganguly, S.K. (1979). Effects of a nine-week yogic training programme on some aspects of physical fitness of physically conditioned young males. Indian Journal of Medical Sciences, 33(10), 258-263.

Giri, S., Dhungana, B., Giri, R., Yadav, B., & Sharma, L. (2021). Yoga practices and its correlates among bank employees at janakpurdham, nepal: a descriptive study. Meds Alliance Journal of Medicine and Medical Sciences, 1(2), 82-86.

Gjestvang, C., Kalhovde, J. M., Mauseth Tangen, E., Clemm, H., & Haakstad, L. A. H. (2025). Impact of In-Person and Mobile Exercise Coaching on Psychosocial Factors Affecting Exercise Adherence in Inactive Women With Obesity: 20-Week Randomized Controlled Trial. Journal of Medical Internet Research, 27, e68462.

Gjestvang, C., Stensrud, T., & Haakstad, L. A. H. (2019). Are changes in physical fitness, body composition and weight associated with exercise attendance and dropout among fitness club members? A prospective longitudinal study. BMJ Open, 9(4), e027987.

Göl, E. (2025). Türkiye'de yoga eğitiminin dönüşümü: Popüler kültür ve sağlık odaklı yaklaşımlar. *Spor Bilimleri Dergisi*, 36(1), 11–24.

Gonçalves LC, Vale RG, Barata NJ, Varejão RV, Dantas EH. Flexibility, functional autonomy and quality of life (QoL) in elderly yoga practitioners. Arch Gerontol Geriatr. 2011 Sep-Oct;53(2):158-62. doi: 10.1016/j.archger.2010.10.028. Epub 2010 Dec 16. PMID: 21167613.

Gothe, N. P., & McAuley, E. (2016). Yoga is as good as stretching–strengthening exercises in improving functional fitness outcomes: Results from a randomized controlled trial. Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences, 71(3), 406-411

Gothe, N., Khan, I., Hayes, J., Erlenbach, E., & Damoiseaux, J. (2019). Yoga effects on brain health: a systematic review of the current literature. Brain Plasticity, 5(1), 105-122.

Grabara, M. (2016). Effects of hatha yoga exercises on spine flexibility in young adults. Biomedical Human Kinetics, 8(1), 113.

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Ectj*, *29*(2), 75-91.

Günebakan, Ö., Acar, M. The effect of tele-yoga training in healthy women on menstrual symptoms, quality of life, anxiety-depression level, body awareness, and self-esteem during COVID-19 pandemic. Ir J Med Sci 192, 467–479 (2023).

Güvenkaya, L. (2019). Yoga Yapan ve Yapmayan Bireylerin Algılanan Stres ve Yaşam Memnuniyetlerinin Karşılaştırılması. (Master Thesis, Yakın Doğu Üniversitesi Sosyal Bilimler Enstitüsü. Lefkoşa.

Hagins, M., Moore, W., & Rundle, A. (2007). Does practicing hatha yoga satisfy recommendations for intensity of physical activity which improves and maintains health and cardiovascular fitness?. BMC complementary and alternative medicine, 7, 40.

Halder, K., Chatterjee, A., Pal, R., Tomer, O. S., & Saha, M. (2015). Age related differences of selected Hatha yoga practices on anthropometric characteristics, muscular strength and flexibility of healthy individuals. International journal of yoga, 8(1), 37-46.

Hall, K. D., Heymsfield, S. B., Kemnitz, J. W., Klein, S., Schoeller, D. A., & Speakman, J. R. (2012). Energy balance and its components: implications for

body weight regulation123. The American journal of clinical nutrition, 95(4), 989-994.

Harner, H., Hanlon, A. L., & Garfinkel, M. (2010). Effect of Iyengar yoga on mental health of incarcerated women: A feasibility study. Nursing research, 59(6), 389-399.

Hart, P. (2017). Test-retest stability of four common body composition assessments in college students. Journal of Physical Fitness Medicine & Treatment in Sports, 1(3).

Haynes, A., Gilchrist, H., Oliveira, J. S., Sherrington, C., & Tiedemann, A. (2022). "I wouldn't have joined if it wasn't online": understanding older people's engagement with teleyoga classes for fall prevention. BMC complementary medicine and therapies, 22(1), 283.

Haynes, A., Gilchrist, H., Oliveira, J. S., Sherrington, C., & Tiedemann, A. (2022). "I Wouldn't Have Joined if It Wasn't Online": Understanding Older People's Engagement With Teleyoga Classes for Fall Prevention. BMC Complementary Medicine and Therapies.

Heiestad, H., Gjestvang, C., & Haakstad, L. A. H. (2020). Investigating self-perceived health and quality of life: a longitudinal prospective study among beginner recreational exercisers in a fitness club setting. BMJ open, 10(6), e036250.

Helder, H. F., Janssen, J. K., & van den Berg, R. M. (2022). Validation of the Tanita MC-780 MA for large-scale body composition screening. Clinical Nutrition Research, 11(1), 34–42.

Helder, H. F., van den Berg, R. M., & Janssen, J. K. (2018). Accuracy of body composition assessment tools in youth and adult populations. European Journal of Clinical Nutrition, 7

Herazo-Beltrán, Y., Pinillos, Y., Vidarte, J., Crissien, E., Suarez, D., & García, R. (2017). Predictors of perceived barriers to physical activity in the general adult population: a cross-sectional study. Brazilian journal of physical therapy, 21(1), 44-50. 2(8), 1095–1101.

Hertel, J., Gay, M. R., & Denegar, C. R. (2002). Differences in postural control during single-leg stance among healthy individuals with different foot types. Journal of Athletic Training, 37(2), 129–132.

Hesse-Biber, S. N. (2012). Triangulation and mixed methods research: Provocative positions. Journal of Mixed Methods Research, 6(2), 75–79.

Heyward, V. H. (2006). Advanced fitness assessment and exercise prescription (5th ed.). Champaign, IL: Human Kinetics

Heyward, V. H. (2006). Advanced fitness assessment and exercise prescription (5th ed.). Human Kinetics.

Hoffman, M., & Payne, V. G. (1995). The effects of proprioceptive ankle disk training on healthy subjects. The Journal of orthopaedic and sports physical therapy, 21(2), 90–93.

Hopkins, W., Marshall, S., Batterham, A., & Hanin, J. (2009). Progressive statistics for studies in sports medicine and exercise science. Medicine+ Science in Sports+ Exercise, 41(1), 3.

Horak, F. B. (2006). Postural orientation and equilibrium: What do we need to know about neural control of balance to prevent falls? Age and Ageing, 35(suppl_2), ii7–ii11.

Hrysomallis C. (2011). Balance ability and athletic performance. Sports medicine (Auckland, N.Z.), 41(3), 221–232.

Hu, H., Song, S., Chai, Y., & Gong, Y. (2020). Study on online teaching of high frequency circuit under covid-19 epidemic. Open Journal of Social Sciences, 08(03), 493-496.

Huberty, J., Eckert, R., Gowin, K., Mitchell, J., Dueck, A. C., Ginos, B. F., Larkey, L., & Mesa, R. (2017). Feasibility study of online yoga for symptom management in patients with myeloproliferative neoplasms. Haematologica, 102(10), e384–e388.

Hui, S. S., & Yuen, P. Y. (2000). Validity of the modified back-saver sit-and-reach test: a comparison with other protocols. Medicine and science in sports and exercise, 32(9), 1655–1659.

Hung, Y.-J., Meredith, G. S., & Gill, S. V. (2021). Reliability of clinical balance tests in individuals with and without visual impairment. Gait & Posture, 85, 90–96.

Ilić, P., Katanic, B., Hadzovic, M., Rakočević, R., Bjelica, D., & Mekic, A. (2024). Barriers to Physical Activity (PA) in the Working Population: A Review. Sport Mont, 22(1), 129-136.

Innes, K. E. and Selfe, T. (2016). Yoga for adults with type 2 diabetes: a systematic review of controlled trials. Journal of Diabetes Research, 2016, 1-23.

Innes, K. E., Selfe, T. K., & Taylor, A. G. (2016). Yoga as a therapeutic intervention for adults with overweight or obesity: A systematic review. Journal of Alternative and Complementary Medicine, 22(3), 175–188.

Iyengar, B. K. S. (1988). The tree of yoga. Shambhala Publications.

Iyengar, B. K. S. (2005). Light on life: The yoga journey to wholeness, inner peace, and ultimate freedom. Rodale.

Iyengar, B.K.S. (2001). Yoga: The Path to Holistic Health. (2014 ed.). London: Dorling Kindersley Limited.

Iyengar, BKS (2001). Astadala Yogamala Volume 2 (2017 ed.). Allied Publisher Private Limited

Iyengar, Geeta (2014). Yoga a Gem for Women (2014 ed.). Allied Publisher Private Limited

Iyengar, P. (n.d.). Understanding the principles behind Iyengar yoga. In Yoga Rahasya.

Iyengar; BKS&Iyengar, Geeta S. Basic Guidelines for Teachers of Yoga, 2003, YOG

J. West, B. Liang, J. Spinazzola, Trauma Sensitive Yoga as a complementary treatment for posttraumatic stress disorder: a qualitative descriptive analysis, Int. J. Stress Manag. 24 (2) (2017) 173–195.

Jacinta Brinsley, Matthew Smout, & Kade Davison. (2021). Satisfaction With Online Versus in-Person Yoga During COVID-19. The Journal of Alternative and Complementary Medicine.

Jagannathan, A, Mukhopadhyay, S., Jasti, N., Shivakumar, V. (2021). Looking Ahead: Tele-Yoga in Mental Health (pp. 228–233).

Jagannathan, A., Bhide, S., Varambally, S., Chandra, P., & Gangadhar, B. (2021). Tele-yoga therapy for common mental health disorders: need for assessment tool and guidelines. International Journal of Yoga, 14(1), 83.

Jain, A. (2012). Branding yoga: the cases of iyengar yoga, siddha yoga and anusara yoga. Approaching Religion, 2(2), 3-17.

Jamatia, B. (2022). Effects of online yoga training on self-perceived stress of the students of certificate programme in yoga (cpy) of ignou. Journal of Learning for Development, 9(3), 563-575.

James-Palmer, A., Anderson, E., & Daneault, J. (2022). Remote delivery of yoga interventions through technology: scoping review. Journal of Medical Internet Research, 24(6), e29092.

Janwantanakul, P., Pensri, P., Jiamjarasrangsri, V., & Sinsongsook, T. (2008). Prevalence of self-reported musculoskeletal symptoms among office workers. Occupational medicine (Oxford, England), 58(6), 436–438.

Jasti N, Bhargav H, George S, Varambally S, Gangadhar BN. Tele-yoga for stress management: Need of the hour during the COVID-19 pandemic and beyond? Asian J Psychiatr. 2020 Dec;54:102334. doi: 10.1016/j.ajp.2020.102334. Epub 2020 Aug 2. PMID: 32777755; PMCID: PMC7396129.

Jeitler, M., Högl, M., Peters, A., Schumann, D., Murthy, V., Bringmann, H., ... & Kessler, C. S. (2020). Qualitative study of yoga for Young adults in school sports. Complementary therapies in medicine, 55, 102584.

Jeter, P. E., Haaz Moonaz, S., Bittner, A. K., & Dagnelie, G. (2015). Ashtanga-based yoga therapy increases the sensory contribution to postural stability in visually-impaired persons at risk for falls as measured by the wii balance board: a pilot randomized controlled trial. PloS one, 10(6), e0129646.

Jeter, P. E., Slutsky, J., Singh, N., & Khalsa, S. B. S. (2013). Yoga as a therapeutic intervention: A bibliometric analysis of published research studies from 1967 to 2013. Journal of Alternative and Complementary Medicine, 19(8), 686–692.

Jeter, P., Slutsky, J., Singh, N., & Khalsa, S. (2015). Yoga as a therapeutic intervention: a bibliometric analysis of published research studies from 1967 to 2013. The Journal of Alternative and Complementary Medicine, 21(10), 586-592.

Jin, H. M., Kim, S. Y., & Moon, H. (2016). Changes in muscular strength, balance, and body composition in middle-aged women with power yoga. The FASEB Journal, 30, 1240-7.

Jones, C. J., Rikli, R. E., & Beam, W. C. (2002). A 30-s chair-stand test as a measure of lower body strength in community-residing older adults. Research Quarterly for Exercise and Sport, 70(2), 113–119.

Kabul, E. G., Çalık, B. B., Aslan, U. B., & Ünver, F. (2018). Sağlıklı gençlerde kısa dönem dinamik stabilizasyon eğitiminin esneklik, kassal endurans ve dinamik denge üzerine etkileri: rastgele kontrollü çalışma. Journal of Exercise Therapy and Rehabilitation, 5(1), 1-8.

Kahya, H. H., & Raspin, C. G. (2017). Yoga therapy for the mind eight-week course: Participants′ experiences. Explore, 13(2), 116-123.

Kaitlyn P. Roland, Jennifer M. Jakobi, & Gareth Jones. (2011). Does Yoga Engender Fitness in Older Adults? A Critical Review. Journal of Aging and Physical Activity.

Kalavalli, M., Kanniammal, C., Mahendra, J., Jayakumar, M., & Kalavalli, M. (2022). Effect of yoga on perceived academic stress among undergraduate nursing students in the selected colleges. Age (In Years), 17(19), 95.

Kaminoff, L., & Matthews, A. (2012). Yoga anatomy (2nd ed.). Human Kinetics.

Kariyawasam, A., Ariyasinghe, A., Rajaratnam, A., & Subasinghe, P. (2019). Comparative study on skill and health related physical fitness characteristics between national basketball and football players in Sri Lanka. BMC research notes, 12(1), 397.

Kartal, A. and Ergin, E. (2020). Investigation of the effect of 6-week yoga exercises on balance, flexibility, and strength in soccer players. International Journal of Human Movement and Sports Sciences, 8(3), 91-96.

Kartal, A., & Ergin, E. (2020). Investigation of the effect of 6-week yoga exercises on balance, flexibility, and strength in soccer players. *International Journal of Human Movement and Sports Sciences*, *8*(3), 91-96.

Keith, N. R., Clark, D. O., Stump, T. E., Miller, D. K., & Callahan, C. M. (2014). Validity and reliability of the back scratch test: Association with shoulder pain, mobility, and activities of daily living. Journal of Aging and Physical Activity, 22(3), 382–389.

Khanna, S. and Greeson, J. (2013). A narrative review of yoga and mindfulness as complementary therapies for addiction. Complementary Therapies in Medicine, 21(3), 244-252.

Khunti, K., Boniface, S., Norris, E., Oliveira, C., & Shelton, N. (2022). The effects of yoga on mental health in school-aged children: a systematic review and narrative synthesis of randomized control trials. Clinical Child Psychology and Psychiatry, 28(3), 1217-1238.

Kishida, M., Mama, S. K., Larkey, L. K., & Elavsky, S. (2018). "Yoga resets my inner peace barometer": a qualitative study illuminating the pathways of how yoga impacts one's relationship to oneself and to others. Complementary therapies in medicine, 40, 215-221.

Knight, C. A., & Weimar, W. H. (2010). Effects of ankle taping on single and double leg balance. Journal of Sports Science and Medicine, 9(1), 30–36.

Kobylińska, D., Lewczuk, K., Marchlewska, M., & Pietraszek, A. (2018). For body and mind: practicing yoga and emotion regulation. Social Psychological Bulletin, 13(1), e25502.

Koh, Y. S., Asharani, P. V., Devi, F., Roystonn, K., Wang, P., Vaingankar, J. A., ... & Subramaniam, M. (2022). A cross-sectional study on the perceived barriers to physical activity and their associations with domain-specific physical activity and sedentary behaviour. BMC public health, 22(1), 1051.

Kolasinski, S. L., Garfinkel, M., Tsai, A. G., Matz, W., Van Dyke, A., & Schumacher, H. R. (2005). Iyengar yoga for treating symptoms of osteoarthritis of the knees: a pilot study. Journal of alternative and complementary medicine (New York, N.Y.), 11(4), 689–693.

Kopač, N., Prosen, M., & Tavčar Krajnc, M. (2020). Combining qualitative and quantitative data in nursing research. Obzornik Zdravstvene Nege, 54(2), 136–143.

Krityakiarana, W., & Jongkamonwiwat, N. (2016). Comparison of balance performance between Thai classical dancers and non-dancers. Journal of Dance Medicine & Science, 20(2), 72–78.

Kumar, A. (2023). Effects of yoga on BMI and BFP: A randomized controlled study. Indian Journal of Health Sciences, 17(2), 78–85.

Kumaratungga, I., Suparna, K., & Giri, M. (2022). Depression levels in yoga practice: a comparative study of two experiencing practicing yoga groups during the covid-19 pandemic in bali. International Research Journal of Ayurveda & Yoga, 05(12), 10-15.

Lacasse, J., Santarossa, S., & Woodruff, S. (2019). #yoga on instagram: understanding the nature of yoga in the online conversation and community. International Journal of Yoga, 12(2), 153.

Lai, Y. T., Huang, H. L., Hsieh, C. C., Lin, C. H., Yang, J. C., Tsou, H. H., Lin, C. C., Li, S. Y., Chan, H. L., & Liu, W. S. (2023). The Effects of Yoga Exercise on Blood Pressure and Hand Grip Strength in Chronic Stroke Patients: A Pilot Controlled Study. International journal of environmental research and public health, 20(2), 1108.

Lankila, T., Puhakka, S., Kärmeniemi, M., Kangas, M., Rusanen, J., & Korpelainen, R. (2022). Residential history and changes in perceived health-The Northern Finland Birth Cohort 1966 study. Health & place, 78, 102931.

Lau, C., Yu, R., & Woo, J. (2015). Effects of a 12-week hatha yoga intervention on cardiorespiratory endurance, muscular strength and endurance, and flexibility in hong kong chinese adults: a controlled clinical trial. Evidence-Based Complementary and Alternative Medicine, 2015, 1-12.

Lauche, R., Langhorst, J., Lee, M. S., Dobos, G., & Cramer, H. (2016). A systematic review and meta-analysis on the effects of yoga on weight-related outcomes. Preventive medicine, 87, 213–232.

Lauche, R., Langhorst, J., Lee, M., Dobos, G., & Cramer, H. (2016). A systematic review and meta-analysis on the effects of yoga on weight-related outcomes. Preventive Medicine, 87, 213-232.

Lee J, Kim E, Wachholtz A. The effect of perceived stress on life satisfaction : The mediating effect of self-efficacy. Chongsonyonhak Yongu. 2016 Oct;23(10):29-47. doi: 10.21509/KJYS.2016.10.23.10.29. PMID: 27996059; PMCID: PMC5154683.

Lee, E.-H. (2016). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, 10(1), 19–24.

Lee, J. A., Kim, J. W., & Kim, D. Y. (2014). Effects of yoga exercise on serum adiponectin and metabolic syndrome factors in obese postmenopausal women. Menopause, 19(3), 296–301.

Lee, J., Lee, E. H., & Kim, Y. (2022). Effects of yoga on stress and psychological health: A meta-analysis. Complementary Therapies in Clinical Practice, 46, 101513.

Lesch, K. J., Tuomisto, S., Tikkanen, H. O., & Venojärvi, M. (2024). Validity and Reliability of Dynamic and Functional Balance Tests in People Aged 19-54: A Systematic Review. International Journal of Sports Physical Therapy, 19(4), 381-393.

Leungbootnak, A., Puntumetakul, R., Chatprem, T., Sae-Jung, S., & Boucaut, R. (2024). Validity and reliability of the Balance Error Score System (BESS) Thai version in patients with chronic non-specific neck pain. PloS one, 19(3), e0301386.

Leungbootnak, A., Puntumetakul, R., Chatprem, T., Sae-Jung, S., & Boucaut, R. (2024). Validity and reliability of the Balance Error Scoring System (BESS) Thai version in patients with chronic non-specific neck pain. PLOS ONE, 19(3), e0301386.

Leyk, D., Gorges, W., Ridder, D., Wunderlich, M., Rüther, T., Sievert, A., & Eßfeld, D. (2007). Hand-grip strength of young men, women and highly trained female athletes. European Journal of Applied Physiology, 99(4), 415–421.

Liao, T., Yin, Y., Hu, X., Tang, S., & Shim, Y. (2023). The relationship between physical activity and subjective well-being in Chinese university students: the mediating roles of perceived health, social support and self-esteem. Frontiers in sports and active living, 5, 1280404.

Liemohn, W., Sharpe, G. L., & Wasserman, J. F. (1994). Criterion-related validity of the sit-and-reach test. Journal of Strength and Conditioning Research, 8(2), 91–94.

Lim, E. J., & Hyun, E. J. (2021). The impacts of pilates and yoga on health-promoting behaviors and subjective health status. International journal of environmental research and public health, 18(7), 3802.

Lin, A. C., Lin, T. T., Tan, Y. K., Pan, W. R., Shih, C. J., Lee, C. J., Chen, S. F., & Wang, F. C. (2022). Superior Gait Symmetry and Postural Stability among Yoga Instructors-Inertial Measurement Unit-Based Evaluation. Sensors (Basel, Switzerland), 22(24), 9683.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Beverly Hills, CA: Sage

Loh, P. Y., Nakashima, H., & Muraki, S. (2016). Effects of grip force on median nerve deformation at different wrist angles. PeerJ, 4, e2510.

Ludwig, O., Kelm, J., & Fröhlich, M. (2017). The effect of balance training on postural control in patients with chronic ankle instability: A systematic review. International Journal of Sports Physical Therapy, 12(5), 590–602.

Luo, X., & Huang, X. (2023). The effects of a yoga intervention on balance and flexibility in female college students during COVID-19: A randomized controlled trial. PloS one, 18(3), e0282260.

Luo, Z., & Xu, J. (2023). Effects of Yoga Practice on Flexibility: A Systematic Review and Meta-Analysis. Journal of Physical Activity and Health, 20(1), 45–56.

Mace & McCulloch, Mace, J. and McCulloch, S. (2022). Yoga teachers on consuming animals. Worldviews Global Religions Culture and Ecology, 27(1-2), 57-85.

Mackenzie, M., Wurz, A., Yamauchi, Y., Pires, L., & Culos-Reed, S. (2016). Yoga helps put the pieces back together: a qualitative exploration of a community-based yoga program for cancer survivors. Evidence-Based Complementary and Alternative Medicine, 2016, 1-10.

Madanmohan, Thombre, D. P., Balakumar, B., Nambinarayanan, T. K., Thakur, S., Krishnamurthy, N., & Chandrabose, A. (1992). Effect of yoga training on reaction time, respiratory endurance and muscle strength. Indian journal of physiology and pharmacology, 36(4), 229–233.

Maity, K., Majumdar, V., Singh, A., & Anand, A. (2021). A recipe for policy research in AYUSH educational and research programs. J Integr Med Case Rep, 2(1), 1-3.

Maksüdünov, A. And Indiran, L. (2022). Perceived satisfaction of students, teachers, and parents during the pandemic towards online teaching. Pamukkale Üniversitesi İşletme Araştırmaları Dergisi, 9(2), 527-550.

Malik, S., Dua, R., Krishnan, A. S., Kumar, S., Kumar, S., Neyaz, O., ... & Barnwal, S. L. (2022). Exercise capacity in patients with chronic obstructive pulmonary disease treated with tele-yoga versus tele-pulmonary rehabilitation: a pilot validation study. Cureus, 14(11).

Manincor, M., Bensoussan, A., Smith, C., Fahey, P., & Bourchier, S. (2015). Establishing key components of yoga interventions for reducing depression and anxiety, and improving well-being: a delphi method study. BMC Complementary and Alternative Medicine, 15(1).

Marathe, A. and Wagani, R. (2022). Role of guru in the sustenance of passion towards classical dance: a qualitative enquiry. Shodhkosh Journal of Visual and Performing Arts, 3(2), 326-340.

Marcori, A. J., Monteiro, P. H. M., Oliveira, J. A., Doumas, M., & Teixeira, L. A. (2022). Single Leg Balance Training: A Systematic Review. Perceptual and Motor Skills, 129(2), 232-252. (Original work published 2022)

Marcori, A. J., Monteiro, P. H. S., & Barbieri, F. A. (2022). Single leg balance training: A systematic review. Perceptual and Motor Skills, 129(1), 3–30.

Massy-Westropp, N., Gill, T. K., Taylor, A. W., Bohannon, R. W., & Hill, C. L. (2011). Hand grip strength: age and gender stratified normative data in a population-based study. BMC Research Notes, 4(1), 127.

Matud, M. P. (2004). Gender differences in stress and coping styles. Personality and Individual Differences, 37(7), 1401–1415.

Mayorga-Vega, D., Merino-Marban, R., & Viciana, J. (2014). Criterion-Related Validity of Sit-and-Reach Tests for Estimating Hamstring and Lumbar Extensibility: a Meta-Analysis. Journal of sports science & medicine, 13(1), 1–14.

McAuley, E., Mullen, S., Szabo-Reed, A., White, S., Wójcicki, T., Mailey, E., … & Kramer, A. (2011). Self-regulatory processes and exercise adherence in older adults. American Journal of Preventive Medicine, 41(3), 284-290.

McAuley, E., White, S., Rogers, L., Motl, R., & Courneya, K. (2010). Physical activity and fatigue in breast cancer and multiple sclerosis: psychosocial mechanisms. Psychosomatic Medicine, 72(1), 88-96.

McCall MC, Ward A, Roberts NW, Heneghan C. Mehta, P., & Sharma, M. (2011). Evaluation of a social cognitive theory-based yoga intervention to reduce anxiety. International quarterly of community health education, 32(3), 205–217.

McCall, M., Thorne, S., Ward, A., & Heneghan, C. (2015). Yoga in adult cancer: an exploratory, qualitative analysis of the patient experience. BMC Complementary and Alternative Medicine, 15(1).

McCarney, R., Warner, J., Iliffe, S., van Haselen, R., Griffin, M., & Fisher, P. (2007). The Hawthorne Effect: A randomised, controlled trial. BMC Medical Research Methodology, 7(1), 30.

McGonigal, K. (2010). A conversation with Mark Singleton, phd. International Journal of Yoga Therapy, 20(1), 17-20.

McGuigan, M. R., Foster, C., & Newton, R. U. (2009). The role of resistance training in body composition and health outcomes. Sports Medicine, 39(2), 101–116.

McGuine, T. A., Greene, J. J., Best, T., & Leverson, G. (2000). Balance as a predictor of ankle injuries in high school basketball players. Clinical Journal of Sport Medicine, 10(4), 239–244.

McHugh, J. E., & Lawlor, B. A. (2013). Perceived health status is associated with hours of exercise per week in older adults independent of physical health. Journal of physical activity & health, 10(8), 1102–1108.

Mehta, D., MacDermid, J., & Sadi, J. (2017). Feasibility of an at home, online, yoga-based and standard exercise intervention for rotator cuff injuries. MOJ Yoga Physical Ther, 2(1), 8-14.

Michalsen, A., Jeitler, M., Brunnhuber, S., Lüdtke, R., Büssing, A., Musial, F., ... & Kessler, C. (2012). Iyengar yoga for distressed women: a 3-armed randomized controlled trial. Evidence-Based Complementary and Alternative Medicine, 2012(1), 408727.

Michie, S., Stralen, M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. Implementation Science, 6(1).

Mihailova, A., Kaminska, I., & Bernane, A. (2014). Physical activity in physiotherapy and physical education high school students. SHS Web of Conferences, 10, 00025.

Mind-body connection in Iyengar yoga. Journal of Yoga and Mindfulness, 5(2), 90–101.

Mohanty, S. (2020). Evolution of yoga practice: A global perspective. *International Journal of Yoga*, 13(1), 45–50.

Mohanty, S., Pradhan, B., & Nagathna, R. (2014). The effect of yoga practice on proprioception in congenitally blind students. British Journal of Visual Impairment, 32(2), 124-135. (Original work published 2014)

Moonaz, S. H., Bingham, C. O., 3rd, Wissow, L., & Bartlett, S. J. (2015). Yoga in Sedentary Adults with Arthritis: Effects of a Randomized Controlled Pragmatic Trial. The Journal of rheumatology, 42(7), 1194–1202.

Morrow, J. R., & Freedson, P. S. (1994). Relationship between habitual physical activity and aerobic fitness in adolescents. Pediatric Exercise Science, 6(4), 315–329.

Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. Nursing Research, 40(2), 120–123.

Mowles, E., Nguyen, C., Nguyen, L., Hollows, J., Eslinger, M., Kowalski, E., … & Limbocker, R. (2020). Lessons from the usma faculty development workshop in teaching stem courses during covid-19..

Muste, D. (2022). Advantages and disadvantages of online teaching perceived by students from pre-service teaching..

Muyor, J. M., Rodríguez-Ruiz, D., Sánchez-Sánchez, J., Zafra, M., & Roche, E. (2014). Criterion-related validity of sit-and-reach and toe-touch tests as a measure of hamstring extensibility in athletes. Journal of Strength and Conditioning Research, 28(2), 546–555.

Nagarathna R, Anand A, Rain M, Srivastava V, Sivapuram MS, Kulkarni R, Ilavarasu J, Sharma MNK, Singh A, Nagendra HR. Yoga Practice Is Beneficial for Maintaining Healthy Lifestyle and Endurance Under Restrictions and Stress Imposed by Lockdown During COVID-19 Pandemic. Front Psychiatry. 2021 Jun 22;12:613762. doi: 10.3389/fpsyt.2021.613762. PMID: 34239456; PMCID: PMC8257944.

Najah, S., Rao, V., & Qassabi, S. (2023). Alternative strategy for teaching and learning during covid-19 pandemic – a case study from middle east college, oman. SHS Web of Conferences, 156, 05002.

Nalbant, G., Lewis, S., & Chattopadhyay, K. (2022). Characteristics of yoga providers and their sessions and attendees in the uk: a cross-sectional survey. International Journal of Environmental Research and Public Health, 19(4), 2212.

Nandlall, N., Hawke, L. D., Hayes, E., Darnay, K., Daley, M., Relihan, J., & Henderson, J. (2022). Learning Through a Pandemic: Youth Experiences With Remote Learning During the COVID-19 Pandemic. SAGE open, 12(3), 21582440221124122.

Nebrida, J. and Bangud, A. (2022). Challenges in hybrid teaching amidst pandemic: the proposed model. Journal of Engineering Research and Reports, 51-64.

Neumark-Sztainer D, Watts AW, Rydell S. Yoga and body image: How do young adults practicing yoga describe its impact on their body image? Body Image. 2018 Dec;27:156-168. doi: 10.1016/j.bodyim.2018.09.001. Epub 2018 Oct 3. PMID: 30292082; PMCID: PMC6691728.

Neumark-Sztainer, D., Watts, A., & Rydell, S. (2018). Yoga and body image: how do young adults practicing yoga describe its impact on their body image?. Body Image, 27, 156-168.

Nguyen, H. M., Ngo, T. T. N., & Nguyen, T. T. (2024). Assessment of the effects of yoga on self-perceived health of elderly. Annals of Applied Sport Science, 12(1), 0-0

Nicosia, F. M., Lisha, N. E., Chesney, M. A., Subak, L. L., Plaut, T. M., & Huang, A. (2020). Strategies for evaluating self-efficacy and observed success in the practice of yoga postures for therapeutic indications: methods from a yoga intervention for urinary incontinence among middle-aged and older women. BMC complementary medicine and therapies, 20, 1-13. (Huberty et al., 2018).

Nicosia, F., Lisha, N., Chesney, M., Subak, L., Plaut, T., & Huang, A. (2020). Strategies for evaluating self-efficacy and observed success in the practice of yoga postures for therapeutic indications: methods from a yoga intervention for urinary incontinence among middle-aged and older women. BMC Complementary Medicine and Therapies, 20(1).

Nikodelis, T., Savvoulidis, S., Athanasakis, P., Chalitsios, C., & Loizidis, T. (2021). Comparative Study of Validity and Reliability of Two Handgrip Dynamometers: K-Force Grip and Jamar. Biomechanics, 1(1), 73-82.

Nishat, S., Ahmad, M. U., Khan, M. A., & Khan, M. A. (2019). Role of yoga in musculoskeletal disorders: A review. International Journal of Yoga, 12(3), 179–185.

Nongkhai, M. P. N., Huntula, S., Kumar, R., & Narkkul, U. (2022). Effects of an online yoga program on anthropometric parameters among overweight female students during the COVID-19 pandemic. Heliyon, 8(9).

Nongkhai, M., Thongsri, J., & Saenbang, W. (2021). Body composition indicators and their associations with health outcomes: A longitudinal study. International Journal of Health Sciences, 15(5), 44–53.

OECD (2023), Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris, .

Oken, B. S., Zajdel, D., Kishiyama, S., Flegal, K., Dehen, C., Haas, M., Kraemer, D. F., Lawrence, J., & Leyva, J. (2006). Randomized, controlled, six-month trial of yoga in healthy seniors: effects on cognition and quality of life. Alternative therapies in health and medicine, 12(1), 40–47.

Okunakol, V. Et Al. 2023. Effect of Yoga and Pilates exercises on lumbar spine physical parameters in healthy women. Journal of Exercise Therapy and Rehabilitation , vol.10 .

OpenAI (2025). ChatGPT. Version 4.o. 2025. https://openai.com/.

Örücü, M. Ç., & Demir, A. (2009). Psychometric evaluation of perceived stress scale for Turkish university students. Stress and Health, 25(1), 103–109.

Osaili, T. (2023). Comparison of students' perceptions of online and hybrid learning modalities during the covid-19 pandemic: the case of the university of sharjah. Plos One, 18(3), e0283513.

Öznalbant, E., & Alvarez, M. D. (2020). A socio-cultural perspective on yoga tourism. Tourism Planning & Development, 17(3), 260-274.

Paillard, T., & Noé, F. (2020). Does monopedal postural balance differ between the dominant leg and the non-dominant leg? A review. Human movement science, 74, 102686.

Park, J., Heilman, K. J., Sullivan, M., Surage, J., Levine, H., Hung, L., ... & Ahn, H. (2022). Remotely supervised home-based online chair yoga intervention for older adults with dementia: Feasibility study. Complementary therapies in clinical practice, 48, 101617.

Patel, N. B., & Patnaik, I. (2021). Yoga for COVID–19. Journal of Family Medicine and Primary Care, 10(11), 4336.

Patel, P., & Pooja, K. (2016). The effect of yoga training on balance and flexibility in female college students. International Journal of Yoga and Allied Sciences, 5(2), 96–101.

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice (4th ed.). SAGE Publications.

Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. Bmj, 316(7139), 1236-1238.

Petchamé, J., Iriondo, I., Villegas, E., Riu, D., & Fonseca, D. (2021). Comparing face-to-face, emergency remote teaching and smart classroom: a qualitative exploratory research based on students' experience during the COVID-19 pandemic. Sustainability, 13(12), 6625.

Petrič, M., Šarabon, N., & Žagar, T. (2014). The impact of hatha yoga practice on flexibility: A pilot study. International Journal of Yoga, 7(1), 33–37.

Pham, C., Hildebrand, C., Tarasovsky, G., Purcell, N., Seal, K., & Nicosia, F. (2024). Implementation of Virtual, Livestream Yoga Classes for Veterans at Home

During the COVID-19 Pandemic: A Mixed-Methods Pilot Program Evaluation. Global advances in integrative medicine and health, 13, 27536130241268107.

Piatt, J. A., Van Puymbroeck, M., Zahl, M., Rosenbluth, J. P., & Wells, M. S. (2016). Examining How the Perception of Health Can Impact Participation and Autonomy Among Adults with Spinal Cord Injury. Topics in spinal cord injury rehabilitation, 22(3), 165–172.

Picciano, A. (2019). Blending with purpose: the multimodal model. Online Learning, 13(1).

Plowman, S. A., & Smith, D. L. (2013). Exercise physiology for health fitness and performance. Lippincott Williams & Wilkins.

Polsgrove, M. J., Eggleston, B. M., & Lockyer, R. J. (2016). Impact of 10-weeks of yoga practice on flexibility and balance of college athletes. International journal of yoga, 9(1), 27-34.

Ponniah, K., Jose, F. T., Kassymova, G. K., Saravanakumar, A. R., & Sasireha, P. (2023). The impact of hybrid learning in educating Tamil educator and learner relationship. International Journal of Advanced and Applied Sciences, 10, 102-107.

Popierz-Rydlewska, M., Kowalczyk, A., & Zalewski, P. (2024). The effects of yoga intervention on BMI and body fat in sedentary adults. Polish Journal of Public Health, 134(1), 89–94.

Post, K. E., & Flanagan, J. (2016). Web based survivorship interventions for women with breast cancer: An integrative review. European journal of oncology nursing : the official journal of European Oncology Nursing Society, 25, 90–99.

Prado, E. T., Raso, V., Scharlach, R. C., & Kasse, C. A. (2014). Hatha yoga on body balance. International journal of yoga, 7(2), 133-137.

Prasad, K., Varrey, A., & Sisti, G. (2016). Medical students' stress levels and sense of well being after six weeks of yoga and meditation. Evidence-Based Complementary and Alternative Medicine, 2016, 9259016.

Prathikanti, S., Rivera, R., Cochran, A., Tungol, J. G., Fayazmanesh, N., & Weinmann, E. (2017). Treating major depression with yoga: A prospective, randomized, controlled pilot trial. PloS one, 12(3), e0173869.

Qadah, R. M., Al-Sharman, A., Shalash, R. J., & Arumugam, A. (2024). Within-and between-day reliability of bioelectrical impedance analysis using a novel Tanita multi-frequency body composition analyzer (MC-780PMA) in healthy young adults. *Fizjoterapia Polska*, (2).

Quattrocchi, A., Garufi, G., Gugliandolo, G., De Marchis, C., Collufio, D., Cardali, S. M., & Donato, N. (2024). Handgrip Strength in Health Applications: A Review of the Measurement Methodologies and Influencing Factors. Sensors, 24(16), 5100.

Raghuram Nagarathna, Ravi Bhatia, Manjari Rain, Vinod Srivastava, Madhava Sai Sivapuram, Ravi Kulkarni, Judu V Ilavarasu, Manjunath N K Sharma, Amit Singh, & Hongasandra Ramarao Nagendra. (2021). Yoga Practice Is Beneficial for Maintaining Healthy Lifestyle and Endurance Under Restrictions and Stress Imposed by Lockdown During COVID-19 Pandemic. Frontiers in Psychiatry.

Rajendran, A. K., & Sethuraman, S. C. (2023). A survey on yogic posture recognition. IEEE Access, 11, 11183-11223.

Reis, R., Hino, A., & Rodriguez-Añez, C. (2010). Perceived stress scale. Journal of Health Psychology, 15(1), 107-114.

Reuter, S. E., Massy-Westropp, N., & Evans, A. M. (2011). Reliability and validity of indices of hand-grip strength and endurance. Australian occupational therapy journal, 58(2), 82–87.

Richard, M., Christina, M. F., Deborah, L. S., Rubio, N., & Kennon, M. S. (1997). Intrinsic motivation and exercise adherence. Int J Sport Psychol, 28(4), 335-354.

Riebe, D., Ehrman, J. K., Liguori, G., & Magal, M. (2018). ACSM's guidelines for exercise testing and prescription (10th ed.). Wolters Kluwer.

Riemann, B. L., Guskiewicz, K. M., & Shields, E. W. (1999). Relationship between clinical and forceplate measures of postural stability. Journal of Sport Rehabilitation, 8(2), 71–82.

Rikli, R. E., & Jones, C. J. (1999). Development and validation of a functional fitness test for community-residing older adults. Journal of Aging and Physical Activity, 7(2), 129–161.

Rikli, R. E., & Jones, C. J. (2001). Senior fitness test manual. Human Kinetics.

Riley, K. E., & Park, C. L. (2015). How does yoga reduce stress? A systematic review of mechanisms of change and guide to future inquiry. Health psychology review, 9(3), 379–396.

Roberts, H. C., Denison, H. J., Martin, H. J., Patel, H. P., Syddall, H., Cooper, C., & Sayer, A. A. (2011). A review of the measurement of grip strength in clinical and epidemiological studies: towards a standardized approach. Age and Ageing, 40(4), 423–429.

Robinson, P., Stojanović, M., Robinson, Z., & Lyons, R. (2021). Pandemonium, panic and the pandemic: implications for human resource development from an unplanned shift to online learning. European Journal of Training and Development, 46(5/6), 667-681.

Rod, S (2024, September 23). Yoga Props explained: Essential techniques, tips, and benefits. Yoga Selection.

Ross, A. and Thomas, S. (2010). The health benefits of yoga and exercise: a review of comparison studies. The Journal of Alternative and Complementary Medicine, 16(1), 3-12.

Ross, A., Friedmann, E., Bevans, M., & Thomas, S. (2012). Frequency of yoga practice predicts health: results of a national survey of yoga practitioners. Evidence-Based Complementary and Alternative Medicine, 2012, 1-10.

Ryd, S., Persson, G., & Gunnarsson, R. K. (2022). The effect of a single visit to a health coach on perceived health in 50-year-old residents in a high-income country - a randomised controlled trial. Scandinavian journal of primary health care, 40(1), 129–138.

Ryman Augustsson, S., Bersås, E., Magnusson Thomas, E., Sahlberg, M., Augustsson, J., & Svantesson, U. (2009). Gender differences and reliability of selected physical performance tests in young women and men. Advances in Physiotherapy, 11(2), 64–70.

Sadawarte, S. and Sahasrabuddhe, P. (2022). Yoga versus classical dance therapy to reduce stress in women working from home. International Journal of Community Medicine and Public Health, 10(1), 188.

Saez, M., Vidiella-Martin, J., & Casasnovas, G. L. (2019). Impact of the great recession on self-perceived health in Spain: a longitudinal study with individual data. BMJ open, 9(1), e023258.

Şahiner, İ., & Balcı, Ş. S. (2010). Çocuklara Uygulanan Farkli Otur-Uzan Esneklik Testlerinin Karşilaştirilmasi. Beden Eğitimi ve Spor Bilimleri Dergisi, 4(1), 1-9

Sahmurova, A., Demir, A., & Demir, T. (2022). The mediating role of cognitive flexibility and intolerance of uncertainty in the relationship between hopelessness and perceived stress. Turkish Journal of Clinical Psychiatry, 25(1), 22–30

Saridi, M., Toska, A., Rekleiti, M., Tzitzikos, G., & Souliotis, K. (2019). Physical activity patterns and health behaviors among health professionals in Greece. Materia Socio-Medica, 31(2), 112–117.

Şaşmaz, M. (2022). Çevrim içi yoga uygulamalarının kadınların stres düzeyleri üzerine etkisi. *Yüksek Lisans Tezi, Hacettepe Üniversitesi*.

Schlicht, J., Godin, J., & Camaione, D. C. (1999). How to help your clients stick with an exercise program: Build self-efficacy to promote exercise adherence. ACSM's Health & Fitness Journal, 3(6), 27-31.

Schmid, A., Puymbroeck, M., Altenburger, P., Schalk, N., Dierks, T., Miller, K., … & Williams, L. (2012). Poststroke balance improves with yoga. Stroke, 43(9), 2402-2407.

Schorderet, C., Hilfiker, R., & Allet, L. (2021). The role of the dominant leg while assessing balance performance. A systematic review and meta-analysis. Gait & posture, 84, 66–78.

Seçer, E., & Kaya, D. Ö. (2021). Rekreasyonel erkek futbolcularda dinamik germe ve miyofasyal gevşetmenin alt ekstremite sıcaklığı, esneklik, denge ve çeviklik üzerine akut etkilerinin karşılaştırılması. Journal of Exercise Therapy and Rehabilitation, 8(2), 168-177.

Sengupta, P. (2012). Health impacts of yoga and pranayama: A state-of-the-art review. International Journal of Preventive Medicine, 3(7), 444–458.

Shah I., Dave N., (2023), comparative study of yama in vashishtha samhita and patanjali yog sutra. (2023). Vidya - A Journal Of Gujarat University, 2(1), 183-186.

Shapiro, D. and Cline, K. (2004). Mood changes associated with iyengar yoga practices: a pilot study. International Journal of Yoga Therapy, 14(1), 35-44.

Sharma, S., Telles, S., Gandharva, K., & Balkrishna, A. (2022). Yoga Instructors' Reported Benefits and Disadvantages Associated With Functioning Online: A Convenience Sampling Survey. Complementary Therapies in Clinical Practice.

Shaw, A. (2021). 'a tool to help me through the darkness': suffering and healing among teacher-practitioners of ashtanga yoga. Anthropology and Medicine, 28(3), 320-340.

Shaw, A. and Kaytaz, E. (2021). Yoga bodies, yoga minds: contextualising the health discourses and practices of modern postural yoga. Anthropology and Medicine, 28(3), 279-296.

Shin, S. (2021). Meta-analysis of the effect of yoga practice on physical fitness in the elderly. International Journal of Environmental Research and Public Health, 18(21), 11663.

Shiraishi, J. C., & Bezerra, L. M. A. (2016). Effects of yoga practice on muscular endurance in young women. Complementary therapies in clinical practice, 22, 69-73.

Shohani, M., Badfar, G., Nasirkandy, M. P., Kaikhavani, S., Rahmati, S., Modmeli, Y., ... & Azami, M. (2018). The effect of yoga on stress, anxiety, and depression in women. International journal of preventive medicine, 9(1), 21.

Simões, R. (2022). In search of the authenticity of contemporary yogas of non-indian matrix. International Journal of Latin American Religions, 6(2), 323-346.

Simon, D., Miller, L., & Chambers, E. (2022). Reliability and application of bioelectrical impedance analysis in health research. Measurement in Physical Education and Exercise Science, 26(3), 240–247.

Singh, A. (2022). Importance of Yoga in Indian Philosophy. Central Asian Journal of Literature, Philosophy and Culture, 3(8), 19-24. Retrieved from

Singh, J., Metri, K. G., Tekur, P., Mohanty, S., Singh, A., & R, N. (2022). Tele-Yoga in the Management of Ankylosing Spondylitis Amidst COVID Pandemic: A Prospective Randomized Controlled Trial.

Sit and reach flexibility test. (n.d.). (12.09.2023) Retrieved from https://www.topendsports.com/testing/tests/sit-and-reach.htm

Sivaramakrishnan, D., Fitzsimons, C., Kelly, P., Ludwig, K., Mutrie, N., Saunders, D. H., & Baker, G. (2019). The effects of yoga compared to active and inactive controls on physical function and health related quality of life in older adults-systematic review and meta-analysis of randomised controlled trials. International Journal of Behavioral Nutrition and Physical Activity, 16, 1-22.

Śliwowski, R., Grygorowicz, M., Hojszyk, R., & Jadczak, Ł. (2021). The relationships between knee extensors/flexors strength and balance control in elite male soccer players. PLOS ONE, 16(11), e0258994.

Smith, E. N. (2024, August 29). Yoga Anatomy: 4 steps to Facilitated shoulder stretching in Gomukhasana. YogaUOnline.

Spadola, C. E., Rottapel, R., Khandpur, N., Kontos, E., Bertisch, S. M., Johnson, D. A., ... & Redline, S. (2017). Enhancing yoga participation: A qualitative investigation of barriers and facilitators to yoga among predominantly racial/ethnic minority, low-income adults. Complementary therapies in clinical practice, 29, 97-104.

Speed-Andrews, A., Stevinson, C., Belanger, L., Mirus, J., & Courneya, K. (2010). Pilot evaluation of an iyengar yoga program for breast cancer survivors. Cancer Nursing, 33(5), 369-381.

Springer, B. A., Marin, R., Cyhan, T., Roberts, H., & Gill, N. W. (2007). Normative values for the unipedal stance test with eyes open and closed. Journal of Geriatric Physical Therapy, 30(1), 8–15.

Standage, M., & Ryan, R. M. (2020). Self-determination theory in sport and exercise. Handbook of sport psychology, 37-56.

Stephens, M. (2012). Yoga sequencing: Designing transformative yoga classes. North Atlantic Books.

Stillwell, S. B., Vermeesch, A. L., & Scott, J. G. (2017). Interventions to Reduce Perceived Stress Among Graduate Students: A Systematic Review With Implications for Evidence-Based Practice. Worldviews on evidence-based nursing, 14(6), 507–513.

Stodden, D., Sacko, R. S., & Nesbitt, D. (2015). A review of the promotion of fitness measures and health outcomes in youth. American Journal of Lifestyle Medicine, 11(3), 232-242.

Streeter, C. C., Gerbarg, P. L., Whitfield, T. H., Owen, L., Johnston, J., Silveri, M. M., ... & Jensen, J. E. (2017). Treatment of major depressive disorder with Iyengar yoga and coherent breathing: a randomized controlled dosing study. The Journal of Alternative and Complementary Medicine, 23(3), 201-207.

Strömberg, A., Thylén, I., Orwelius, L., Klompstra, L., & Jaarsma, T. (2021). Tele-Yoga in Long Term Illness-Protocol for a Randomised Controlled Trial Including a Process Evaluation and Results from a Pilot Study. International journal of environmental research and public health, 18(21), 11343.

Suman, S., Thakur, B., & Telles, S. (2021). Online yoga training on mental health: Lessons from the pandemic. *Journal of Clinical and Diagnostic Research*, 15(8), VE01–VE04.

Sumaryanti, S., Nurtanto, M., & Pardjono, P. (2018). Skill-related and health-related fitness: Foundations for performance in physical education. *Journal of Physics: Conference Series*, 953, 012078.

Sun, S., Pan, W., & Wang, L. L. (2010). A comprehensive review of effect size reporting and interpreting practices in academic journals in education and psychology. Journal of educational psychology, 102(4), 989.

Surpi, N. (2021). Teks-teks klasik yoga dan refleksinya bagi pengajaran yoga di bali. Jurnal Yoga Dan Kesehatan, 4(2), 163.

Svatmarama. (2024). *Hatha Yoga Pradipika* (B. Ercan, Çev. ve Yorum.). Okyanus Yayınları.

Tan, H., & Çolak, S. (2021). 8–10 yaş çocuklarda core egzersizlerinin denge performanslarına etkisi. Kocaeli Üniversitesi Sağlık Bilimleri Dergisi, 7(1), 92-97.

Telles, S., Gaur, V., & Balkrishna, A. (2009). Effect of a yoga practice session and a yoga theory session on state anxiety. Perceptual and Motor Skills, 109(3), 924-930.

Telles, S., Naveen, K. V., & Dash, M. (2014). Comparative effects of yoga and physical exercise on body composition. International Journal of Yoga, 7(2), 104–110.

Telles, S., Naveen, K.V., Gaur, V. et al. Effect of one week of yoga on function and severity in rheumatoid arthritis. BMC Res Notes 4, 118 (2011). https://doi.org/10.1186/1756-0500-4-118

Telles, S., Naveen, V. K., Balkrishna, A., & Kumar, S. (2009). Short term health impact of a yoga and diet change program on obesity. Medical Science Monitor, 16(1), CR35-CR40.

Telles, S., Sharma, S. K., Singh, A., Kala, N., Upadhyay, V., Arya, J., & Balkrishna, A. (2019). Quality of Life in Yoga Experienced and Yoga Naïve Asian Indian Adults with Obesity. Journal of obesity, 2019

Telles, S., Sharma, S., Singh, N., & Balkrishna, A. (2017). Characteristics of yoga practitioners, motivators, and yoga techniques of choice: a cross-sectional study. Frontiers in Public Health, 5.

Telles, S., Yadav, A., Singh, N., & Balkrishna, A. (2020). Mental health promotion through yoga: A conceptual framework. *International Journal of Yoga*, 13(2), 89–95.

Tetik Küçükelçi, D. (2019). Yoga İnanç Ölçeği(YİÖ): Türkçe'ye Uyarlama, Geçerlik Ve Güvenirlik Çalışması. Uluslararası Kültürel Ve Sosyal Araştırmalar Dergisi, 5(1), 1-14

Thomas, S., Reading, J., & Shephard, R. J. (1992). Revision of the Physical Activity Readiness Questionnaire (PAR-Q). Canadian Journal of Sport Sciences, 17(4), 338–345.

Tomlinson, J., Shaw, T., Munro, A., Johnson, R., Madden, D., Phillips, R., … & McGregor, D. (2013). How does tele-learning compare with other forms of education delivery? a systematic review of tele-learning educational outcomes for health professionals. New South Wales Public Health Bulletin, 24(2), 70.

Torppa-Saarinen, E., Tolvanen, M., Suominen, A. L., & Lahti, S. (2018). Changes in perceived oral health in a longitudinal population-based study. Community Dentistry and Oral Epidemiology, 46(6), 569-575.

Tran, M. D., Holly, R. G., Lashbrook, J., & Amsterdam, E. A. (2001). Effects of Hatha yoga practice on the health-related aspects of physical fitness. Preventive Cardiology, 4(4), 165–170.

Tran, M., Holly, R., Lashbrook, J., & Amsterdam, E. (2001). Effects of hatha yoga practice on the health-related aspects of physical fitness. Preventive Cardiology, 4(4), 165-170.

Troester JC, Jasmin JG, Duffield R. Reliability of Single-Leg Balance and Landing Tests in Rugby Union; Prospect of Using Postural Control to Monitor Fatigue. J Sports Sci Med. 2018 May 14;17(2):174-180. PMID: 29769817; PMCID: PMC5950733.

Troester, J. C., Jasmin, J. G., & Duffield, R. (2018). Reliability of single-leg balance and landing tests in rugby union; prospect of using postural control to monitor fatigue. Journal of Sports Science & Medicine, 17(2), 174–180.

Tul, Y., Unruh, A., & Dick, B. D. (2011). Yoga for chronic pain management: a qualitative exploration. Scandinavian journal of caring sciences, 25(3), 435-443.

Ulla, M. and Perales, W. (2022). Hybrid teaching: conceptualization through practice for the post covid19 pandemic education. Frontiers in Education, 7.

Ulusal Tez Merkezi | Anasayfa. (n.d.). Retrieved from

Ulusal Tez Merkezi | Anasayfa. (n.d.). Retrieved May 21, 2025, from

Upadhyay, P., Narayanan, S., Khera, T., Kelly, L., Mathur, P., Shanker, A., … & Subramaniam, B. (2021). Perceived stress, resilience, well-being, and covid 19 response in isha yoga practitioners compared to matched controls: a research protocol. Contemporary Clinical Trials Communications, 22, 100788.

Uysal, G. (2022). Çevrim içi yoga uygulamasının kadınlarda ruh sağlığı üzerine etkisi. *Yüksek Lisans Tezi, İstanbul Üniversitesi*.

Vaishya, R., Misra, A., Vaish, A., Ursino, N., & D'Ambrosi, R. (2024). Hand grip strength as a proposed new vital sign of health: a narrative review of evidences. Journal of health, population, and nutrition, 43(1), 7.

Vakola, M. (2016). The reasons behind change recipients' behavioral reactions: a longitudinal investigation. Journal of Managerial Psychology, 31(1), 202-215.

Van Ness, P. H. (1999). Yoga as spiritual but not religious: A pragmatic perspective. American journal of theology & philosophy, 15-30.

Van Puymbroeck, M., Burk, B. N., Shinew, K. J., Cronan Kuhlenschmidt, M., & Schmid, A. A. (2013). Perceived health benefits from yoga among breast cancer survivors. American journal of health promotion : AJHP, 27(5), 308–315.

Varughese, G., Mathew, J., & Philip, M. (2023). Yoga practice and changes in body composition among obese women: A clinical trial. Journal of Women's Health and Fitness, 11(1), 58–65.

Varughese, J. and Rema, M. (2021). Perceived stress, emotional intelligence and self-efficacy among nursing students during the covid-19 pandemic. International Journal of Research and Studies Publishing, 11(4), 201-207.

Veletsianos, G. and Seaman, J. (2020). U.s. faculty and administrators' experiences and approaches in the early weeks of the covid-19 pandemic. Online Learning, 24(2).

Verma, A., Rathore, V., & Yadav, N. (2023). Yoga for proprioception: a systematic review. Yoga Mimamsa, 55(2), 107-113.

Villafañe, J. H., Valdes, K., Buraschi, R., Martinelli, M., Bissolotti, L., & Negrini, S. (2016). Reliability of the Handgrip Strength Test in Elderly Subjects With Parkinson Disease. Hand (New York, N.Y.), 11(1), 54–58.

Vipin Wadhen & Tina Cartwright. (2021). Feasibility and Outcome of an Online Streamed Yoga Intervention on Stress and Wellbeing of People Working From Home During COVID-19. Work.

Wang, D., & Hagins, M. (2016). Perceived benefits of yoga among urban school students: A qualitative analysis. Evidence-Based Complementary and Alternative Medicine, 2016(1), 8725654.

Wang, D., & Hagins, M. (2016). Perceived benefits of yoga among urban school students: A qualitative analysis. Evidence-Based Complementary and Alternative Medicine, 2016(1), 8725654.

Warburton, D. E. R., Jamnik, V. K., Bredin, S. S. D., & Gledhill, N. (2011). The Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) and Electronic Physical Activity Readiness Medical Examination (ePARmed-X+). The Health & Fitness Journal of Canada, 4(2), 3–17.

West J, Otte C, Geher K, Johnson J, Mohr DC. Effects of Hatha yoga and African dance on perceived stress, affect, and salivary cortisol. Ann Behav Med. 2004 Oct;28(2):114-8. doi: 10.1207/s15324796abm2802_6. PMID: 15454358.

Wile , N. (2015). Iyengar yoga. Scribd. https://www.scribd.com/document/603053922/Iyengar-yoga

Williams, K. A., Petronis, J., Smith, D., Goodrich, D., Wu, J., Ravi, N., Doyle, E. J., Jr, Gregory Juckett, R., Munoz Kolar, M., Gross, R., & Steinberg, L. (2005). Effect of Iyengar yoga therapy for chronic low back pain. Pain, 115(1-2), 107–117.

Wirawan, I., Koldoris, T., & Kembarawan, I. (2022). Preventing of the covid-19 pandemic spreading through the yoga sūrya namaskāra practices at the hindu community in mataram. International Journal of Health Sciences, 6(2), 1135-1147.

Woods, K., Bishop, P., & Jones, E. (2007). Warm-up and stretching in the prevention of muscular injury. Sports Medicine, 37(12), 1089–1099.

Woodyard, C. (2011). Exploring the therapeutic effects of yoga and its ability to increase quality of life. International Journal of Yoga, 4(2), 49.

Yen, I., Michael, Y., & Perdue, L. (2009). Neighborhood environment in studies of health of older adults. American Journal of Preventive Medicine, 37(5), 455-463.

Yoshihara, K., Hiramoto, T., Oka, T., Kubo, C., & Sudo, N. (2014). Effect of 12 weeks of yoga training on the somatization, psychological symptoms, and stress-related biomarkers of healthy women. BioPsychoSocial medicine, 8(1), 1.

Youkhana, S., Dean, C. M., Wolff, M., Sherrington, C., & Tiedemann, A. (2016). Yoga-based exercise improves balance and mobility in people aged 60 years and over: A systematic review and meta-analysis. Age and Ageing, 45(1), 21–29.

Younas, A., Ali, P., & Porr, C. (2023). The convergent parallel design in mixed methods research: A critical review. International Journal of Nursing Studies, 144, 104425. https://doi.org/10.1016/j.ijnurstu.2023.104425

Young-Speirs, M., Forbes, C., Patton, M., Russell, K. B., Stokoe, M., Reynolds, K., & Schulte, F. (2021). Perceived Health among Adolescent and Young Adult Survivors of Childhood Cancer. Current Oncology, 28(1), 825-836.

Yusuf, R., Yusof, H. M., & Rahman, R. A. (2020). Components of physical fitness and academic achievement. *International Journal of Psychosocial Rehabilitation*, 24(3), 1735–1741.

Zheng, H., Zhang, H., & Zhang, H. (2022). Design of teaching system of physical yoga course in colleges and universities based on computer network. Security and Communication Networks, 2022, 1-9.

Zhu, R., Wang, W., Zhao, L., & Mao, S. (2021). Comparisons of tai chi and Iyengar yoga intervention effects on muscle strength, balance, and confidence in balance. The Journal of sports medicine and physical fitness, 61(10), 1333-1338.

Zou, L., Sasaki, J. E., Wei, G. X., Huang, T., Yeung, A. S., Neto, O. B., Chen, K. W., & Hui, S. S. (2018). Effects of Mind–Body Exercises (Tai Chi/Yoga) on Heart Rate Variability Parameters and Perceived Stress: A Systematic Review with Meta-Analysis of Randomized Controlled Trials. Journal of clinical medicine, 7(11), 404.

APPENDICES

A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
T: +90 312 210 22 91
F: +90 312 210 79 59
ueam@metu.edu.tr
www.ueam.metu.edu.tr

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

07 NİSAN 2023

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Irmak HÜRMERİÇ ALTUNSÖZ

Danışmanlığını yürüttüğünüz Özlem ASLAN'ın **"Çevrimiçi ve Yüzyüze Yoga Eğitimlerinin Genç Yetişkin Bireylerin Sağlıkla İlgili Fiziksel Uygunluk, Algılanan Stres, Sağlık ve Öz Yeterlilik Üzerine Etkisi"** başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek **0204-ODTUİAEK-2023** protokol numarası ile onaylanmıştır

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan

Prof.Dr. İ.Semih AKÇOMAK
Üye

Doç. Dr. Ali Emre Turgut
Üye

Doç.Dr. Şerife SEVİNÇ
Üye

Dr. Öğretim Üyesi Murat Perit ÇAKIR
Üye

Dr. Öğretim Üyesi Süreyya ÖZCAN KABASAKAL
Üye

Dr. Öğretim Üyesi Müge GÜNDÜZ
Üye

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
T: +90 312 210 22 91
F: +90 312 210 79 59
ueam@metu.edu.tr
www.ueam.metu.edu.tr

19 HAZİRAN 2023

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Irmak HÜRMERİÇ ALTUNSÖZ

Danışmanlığını yürüttüğünüz Özlem ASLAN'ın ***"Çevrimiçi ve Yüzyüze Iyengar Yoga Eğitimlerinin Genç Yetişkin Bireylerin Fiziksel Uygunluk, Algılanan Stres, Sağlık ve Öz Yeterlilik Üzerine Etkisi"*** başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek **331-ODTUİAEK-2023** protokol numarası ile onaylanmıştır.

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan

Prof.Dr. İ. Semih AKÇOMAK
Üye

Doç. Dr. Ali Emre Turgut
Üye

Doç. Dr. Şerife SEVİNÇ
Üye

Doç.Dr. Murat Perit ÇAKIR
Üye

Dr. Öğretim Üyesi Süreyya ÖZCAN KABASAKAL
Üye

Dr. Öğretim Üyesi Müge GÜNDÜZ
Üye

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
T: +90 312 210 22 91
F: +90 312 210 79 59
ueam@metu.edu.tr
www.ueam.metu.edu.tr

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

18 OCAK 2024

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Irmak HÜRMERİÇ ALTUNSÖZ

Danışmanlığını yürüttüğünüz Özlem ASLAN'ın ***"Çevrimiçi ve Yüzyüze Iyengar Yoga Eğitimlerinin Genç Yetişkin Kadın Bireylerin Fiziksel Uygunluk, Algılanan Stres, Sağlık ve Öz Yeterlilik Üzerine Etkisi"*** başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek **0072-ODTUİAEK-2024** protokol numarası ile onaylanmıştır

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan

Prof.Dr. İ. Semih AKÇOMAK
Üye

Doç. Dr. Ali Emre Turgut
Üye

Doç. Dr. Şerife SEVİNÇ
Üye

Doç.Dr. Murat Perit ÇAKIR
Üye

Dr. Öğretim Üyesi Süreyya ÖZCAN KABASAKAL
Üye

Dr. Öğretim Üyesi Müge GÜNDÜZ
Üye

B. GUIDELINES FOR TEST PREPARATION

Nutritional Preparation

- Ensure you are well-nourished on the day of the test.
- If possible, consume a high-carbohydrate diet (pasta, potatoes, cereals, toast, fruits, etc.) in the 24 hours before the test session.
- Avoid consuming a heavy meal within two hours before testing; however, eating a light meal within four hours before testing is strongly recommended.
- Avoid caffeine-containing products (such as coffee, cola, or tea) on the day of the test.
- Do not consume alcohol or tobacco products for at least 24 hours before the test.
- Make sure you are fully hydrated, especially in warm conditions. Drink water regularly during the days leading up to the test, particularly within the 12 hours before the session.
- Replenish body fluids by drinking water regularly during the test session, and continue hydrating after the test to replace any fluids lost during exercise.

Physical Preparation

- Avoid strenuous exercise in the 24 hours before the test. Do not perform any exercise on the day of the test to ensure you are well rested.
- Wear lightweight clothing suitable for the conditions (e.g., shorts/training pants, t-shirt/tank top, sweatshirt) and non-slip athletic shoes with laces tied securely.
- Remove restrictive jewelry such as watches, bracelets, or long earrings that may interfere with the equipment.
- Do not participate if you are suffering from an injury or illness that may worsen due to participation or if you are not feeling well/in good general health.

- Warm up before the test begins by performing a 10-minute warm-up routine:
    - 5 minutes of light aerobic activity (e.g., slow jogging or stationary cycling)
    - Followed by 5 minutes of stretching exercises targeting both upper and lower body. Example stretches may include those shown below.



Post-Test

- Cool down properly after completing all test items.
- Do not sit or lie down immediately after testing. Perform a 5-minute cool-down routine:
    - Continue with 3 minutes of moderate to light aerobic activity (e.g., jogging or walking)
    - Then perform 2 minutes of light stretching exercises for both the upper and lower body. Example movements may include those shown in the image below.


COOL DOWN AFTER EXERCISE
Shoulder Stretch
Triceps Stretch
Hip Flexor Stretch
Cat Cow
Standing Forward Bend
Quadriceps Stretch
Child's Pose
ABS Stretch

C. QUALITATIVE DATA COLLECTION QUESTIONNAIRE

INTERVIEW QUESTIONS
(At the end of the 8-week yoga sessions)

1. What do you think about yoga?
2. How have your thoughts about yoga changed after participating in this study? (Both positive and negative changes)
3. How has participating in the yoga sessions affected your overall health condition?
4. What kind of physical changes have you experienced as a result of our yoga sessions? Could you describe these changes?
5. What kind of emotional changes have you experienced as a result of our yoga sessions? Could you describe these changes?
6. How did your stress levels change during and after the yoga intervention? Could you describe these changes?
7. You were part of the face-to-face or online group. What are your thoughts on in-person/online yoga training? (Things you liked, disliked, found difficult, or enjoyable, etc.)
8. How did you feel after the yoga sessions? (Also, please rate the physical/social/emotional aspects before and after the sessions.)
9. How did your knowledge or ability to do yoga change? (Please rate your experience before and after the sessions.)
10. If you were to join such a program again, what kind of adjustments or additions would you like to see? (In terms of duration, content, the instructor's teaching methods, etc.)
11. Do you plan to continue practicing yoga?
12. Is there anything else you would like to add?

D. STATISTICAL INFORMATION FORM

Confidentiality and privacy principles will be observed. Names will be anonymized by using numerical coding.

1. **Name/Surname**
2. **Date of Birth (Day/Month/Year)**
3. **Current Education Level**
   - Undergraduate Student (including prep year)
   - Master's Student
   - PhD Student
   - Postdoctoral Researcher
   - Graduate
4. **Marital Status**
   - Single
   - In a relationship
   - Married
   - Divorced/Separated
   - Prefer not to say
   - Other
5. **Employment Status**
   (For part-time or full-time working students: student employed; for non-working students: student unemployed)
   - Student (not working)
   - Student (working)
   - Full-Time Employee
   - Part-Time Employee
   - Self-employed
   - Unemployed
   - Other
6. **Which sector do you work in?**
   - I am a student, not working
   - Engineering
   - Banking
   - Manufacturing
   - Marketing
   - Service Sector
   - Information Technology
   - Health
   - Education
   - Human Resources
   - Other
7. **Employment Sector**
   - Public

- Private

8. **What is your academic department/program?**
9. **Where do you live?**
   - Dormitory
   - Shared apartment
   - With family
   - Alone in a house
   - Other
10. **Which income group do you consider yourself in?**
    - Low income
    - Lower-middle income
    - Middle income
    - Upper-middle income
    - High income
11. **Which of the following habits do you engage in 4 or more times per week?**
    - Smoking
    - Alcohol consumption
    - Healthy breakfast
    - Fruit consumption
    - Vegetable consumption
    - Sugar consumption
    - Consumption of meat and dairy products
    - 7–8 hours of sleep
    - Smartphone use (screen time over 4 hours)
    - Physical exercise
12. **Psychological and emotional barriers to physical activity** (Maximum 3 selections)
    - Lack of motivation
    - Lack of confidence in exercise ability
    - Concerns about physical appearance (shame, embarrassment, etc.)
    - Not enjoying exercise
    - Fear of injury
13. **Personal barriers to physical activity** (Maximum 3 selections)
    - Financial reasons
    - Lack of time
    - Lack of goal-setting or monitoring
    - Lack of active role models
    - Belief that exercise is ineffective
    - Feeling tired
14. **Environmental barriers to physical activity** (Maximum 3 selections)
    - Transportation issues (traffic, public transport problems)
    - Lack of sports centers
    - Inadequate infrastructure (lack of green spaces, walking/cycling paths, etc.)
    - Safety concerns (dark areas, stray dogs, harassment)
    - Air pollution
    - Lack of encouragement/support from family, friends, or partner
    - Weather conditions (rain, heat, snow, humidity, etc.)
    - Lack of social groups (at work, on campus, among friends, etc.)

15. **How would you rate your self-confidence in behavior change or developing a new habit? (Out of 10, 10 highest)**
16. **Based on your experiences, how would you rate distance education? (Out of 10, 10 most like)**
    (Overall experience during and after the COVID-19 pandemic: benefit, enjoyment, convenience, forming social connections, etc.)
17. **Based on your experiences, how would you rate traditional (face-to-face) education? (Out of 10)**
    (Overall experience: benefit, enjoyment, convenience, forming social connections, etc.)

E. PERCEIVED HEALTH STATUS SCALE

Name, Surname:
Date:

	Very Good	Good	Fair	Poor
In general, how would you rate your health?	1	2	3	4

F. ALGILANAN STRES ÖLÇEĞİ

Adı Soyadı:
Tarih:
Yönerge:
Geçtiğimiz **ay** içerisindeki kişisel deneyimleriniz hakkında bir dizi soru yöneltilmektedir. Her soruyu dikkatlice okuyarak size en uygun seçeneği n altındaki kutuya bir çarpı işareti koyarak cevaplayınız. Soruların doğru veya yanlış cevabı yoktur. Önemli olan sizin duygu ve düşüncelerinizi y ansıtan yanıtları vermenizdir.

	HİÇ	NEREDEYSE HİÇ	BAZEN	SIKÇA	ÇOK SIK
1. Son bir ay içinde, beklenmedik şekilde gerçekleşen olaylardan dolayı ne sıklıkta üzüldünüz?	0	1	2	3	4
2. Son bir ay içinde ne sıklıkta, yaşamınızdaki önemli şeyleri kontrol edemediğinizi hissettiniz?	0	1	2	3	4
3. Son bir ay içinde kendinizi ne sıklıkta, gergin ve stresli hissettiniz?	0	1	2	3	4
4.Son bir ay içinde, yaşamınızdaki can sıkıcı durumlarla ne sıklıkta başarılı bir biçimde baş ettiniz?	0	1	2	3	4
5. Son bir ay içinde ne sıklıkta, yaşamınızda meydana gelen önemli değişikliklerle etkili bir biçimde başa çıktığınızı hissettiniz?	0	1	2	3	4
6. Son bir ay içinde ne sıklıkta, kişisel sorunlarınızla baş etme yeteneğinizden emin oldunuz?	0	1	2	3	4
7. Son bir ay içinde ne sıklıkta, işlerin istediğiniz gibi gittiğini hissettiniz?	0	1	2	3	4
8. Son bir ay içinde ne sıklıkta, yapmak zorunda olduğunuz her şeyin üstesinden gelemeyeceğinizi düşündünüz?	0	1	2	3	4
9. Son bir ay içinde yaşamınızdaki rahatsız edici olayları ne sıklıkta kontrol edebildiniz?	0	1	2	3	4
10. Son bir ay içinde ne sıklıkta, yaşamınızdaki olaylara hâkim olduğunuzu hissettiniz?	0	1	2	3	4
11. Son bir ay içinde, kontrolünüz dışında gerçekleşen şeylerden dolayı ne sıklıkta öfkelendiniz?	0	1	2	3	4
12.Son bir ay içinde ne sıklıkta, üstesinden gelmek zorunda olduğunuz şeyler üzerinde düşündünüz?	0	1	2	3	4
13.Zamanınızı nasıl geçirdiğinizi son bir ay içinde ne sıklıkta kontrol edebildiniz?	0	1	2	3	4
14.Son bir ay içinde ne sıklıkta, güçlüklerin, üstesinden gelemeyeceğiniz kadar çoğaldığını hissettiniz?	0	1	2	3	4

G. PERCEIVED STRESS SCALE

Name and Surname:
Date:
Instructions: A series of questions is presented regarding your personal experiences over the past month. Please read each question carefully and mark an "X" in the box under the option that best applies to you. There are no right or wrong answers. What matters is that you respond in a way that truly reflects your feelings and thoughts.

	Never	Almost Never	Sometime	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4. In the last month, how often have you dealt successfully with day-to-day problems and annoyances	0	1	2	3	4
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	0	1	2	3	4
6. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
7. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
8. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
9. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
10. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
11. In the last month, how often have you been angered because of things that were outside your control?	0	1	2	3	4
12. In the last month, how often have you found yourself thinking about things that you have to accomplish	0	1	2	3	4
13. In the last month, how often have you been able to control the way you spend your time	0	1	2	3	4
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

H. YOGA ÖZ-YETERLİLİK ÖLÇEĞİ (Turkish Adaptation)

Adı Soyadı:
Tarih:
Yönerge: Aşağıda yoga ile ilgili kişisel deneyimleriniz hakkında bir dizi soru yöneltilmektedir. Her soruyu dikkatlice okuyarak size en uygun 1 ile 5 arası puan vererek cevaplayınız. Soruların doğru veya yanlış cevabı yoktur. Önemli olan sizing duygu ve düşüncelerinizi yansıtan yanıtları vermenizdir.

		Hiç Katılmıyorum	Katılmıyorum	Fikrim Yok	Katılıyorum	Kesinlikle Katılıyorum
Beden	*Yoga yaparken;* 1. Hareketleri yaparken mümkün olduğunca rahat kalabilirim.	1	2	3	4	5
	2. Zihnimi, bedenimin hareketlerine odaklı tutabiliyorum.	1	2	3	4	5
	3.Bedenimin hareketlerini nefesimle uyumlu hale getirebiliyorum.	1	2	3	4	5
	4. Bedenimi yumuşak ve akışkan bir şekilde hareket ettirebiliyorum.	1	2	3	4	5
	5. Bedenimde bir istikrar hissi sürdürebiliyorum.	1	2	3	4	5
Nefes	*Yoga yaparken;* 6. Nefesimi sakin ve sürekli tutabilirim.	1	2	3	4	5
	7. Nefesimi düzenlerken rahat kalabilirim.	1	2	3	4	5
	8. Zihnimi nefesime odaklayabilirim.	1	2	3	4	5
	9. Nefesimi daha uzun ve daha derin alırken endişeli hissetmiyorum.	1	2	3	4	5
Zihin	*Yoga pratiğim esnasında*; 10. Dikkatim dağılırsa zihnimi tekrar odaklayabilirim.	1	2	3	4	5
	11. Dikkatimi sürdürebilirliğimden eminim.	1	2	3	4	5
	12. Meditatif bir nesneye veya noktaya odaklanmaya devam edebilirim.	1	2	3	4	5

I. YOGA SELF-EFFICACY SCALE (Original English Version)

Name and Surname:
Date:
Instructions: Below are a series of questions about your personal experiences with yoga. Please read each question carefully and respond by selecting the option that best reflects your feelings and thoughts, using a scale from 1 to 5. There are no right or wrong answers. What matters is that you give responses that truly reflect your own emotions and opinions.

		Strongly Disagree				Neutral				Strogly Agree
Body	*When I practice yoga…*									
	1. I am able to remain as comfortable as possible while doing movements.	1				5				9
	2. I am able to keep my mind focused on movements of my body.	1				5				9
	3. I can coordinate the movements of my body with my breath.	1				5				9
	4. I am able to move my body smoothly	1				5				9
	5. I am able to maintain a feeling of stability in my body.	1				5				9
Breath	*When I practice yoga…*									
	6. I am able to keep my breath smooth and continuous	1				5				9
	7. I am able to remain comfortable while regulating my breath.	1				5				9
	8. I am able to focus my mind on my breath.	1				5				9
	9. I am able to make my breath longer and deeper without feeling anxious.	1				5				9
Mind	*Yoga pratiğim esnasında;*									
	10. If distracted, I can re-focus my mind.	1				5				9
	11. I am confident that I can maintain my attention.	1				5				9
	12. If asked, I am able to visualize or have an impression of an object in my mind.	1				5				9
	13. I am able to remain focused on a meditative object or point.	1				5				9

J. HERKES İÇİN EGZERSİZE HAZIRBULUNUŞLUK ANKETİ (EGZ-A+) / PHYSICAL ACTIVITY READINESS QUESTIONNAIRE (PAR-Q)

Ad-Soyad:
Tarih:

Düzenli egzersizin sağlığa yararları açıkça bilinmektedir; herkes her gün egzersiz yapmalıdır. Egzersize başlamak çoğu insan için oldukça güvenlidir.

Bu anket size daha aktif egzersize başlamadan önce doktorunuzun veya egzersiz uzmanının önerilerini almaya gerek olup olmadığını söyleyecektir.

GENEL SAĞLIK SORULARI

Lütfen aşağıdaki 7 soruyu dikkatlice okuyun ve her birini dürüstçe yanıtlayın: EVET veya HAYIR kutucuğunu işaretleyin	**EVET**	**HAYIR**
1) Doktorunuz size hiç *kalp hastalığınız olduğunu* **VEYA** *tansiyonunuzun yüksek olduğunu* söyledi mi?		
2) Dinlenirken, günlük yaşantınız içerisinde **VEYA** egzersiz yaparken göğüs ağrısı hissettiniz mi?		
3) Son 12 ay içinde baş dönmesi sebebiyle dengenizi yitirdiğiniz **VEYA** bilincinizi kaybettiğiniz (bayıldığınız) oldu mu? Eğer baş dönmeniz (ağır egzersiz sırasında olsa bile) fazla soluklanmayla ilişkiliyse lütfen **HAYIR'ı** işaretleyiniz.		
4) Bugüne kadar size hiç (kalp hastalığı ve yüksek tansiyon hariç) kronik (sürekli) bir hastalık tanısı konuldu mu? **LÜTFEN HASTALIKLARI BURAYA YAZINIZ:**		
5) Halen kronik (sürekli) bir hastalık için reçeteli ilaç kullanıyor musunuz? **LÜTFEN HASTALIKLARI VE İLAÇLARI BURAYA YAZINIZ:**		
6) Halen (ya da son 12 ay içinde) egzersizle kötüleşebilecek kemik, eklem veya yumuşak doku (kas, bağ veya kiriş) sorununuz var mı? Geçmişte var olan bir sorununuz, **şu anda egzersiz yapmanızı kısıtlamayacaksa** lütfen **HAYIR**'ı işaretleyiniz. **LÜTFEN HASTALIKLARI BURAYA YAZINIZ:**		

7) Doktorunuz size hiç egzersizi sadece tıbbi gözetim altındayken yapabileceğinizi söyledi mi?		

TIBBİ DURUMUNUZLA İLGİLİ TAMAMLAYICI SORULAR

1. Eklem Hastalığı, Kemik Erimesi, Sırt veya Bel Rahatsızlığınız var mı? Varsa aşağıdaki soruları yanıtlayın, **Yok**☐ ise 2. soruya geçin.

1a.İlaçlarla veya doktorun verdiği diğer tedaviler ile rahatsızlığınızla baş etmekte zorlanıyor musunuz? (Şu an ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın)

EVET☐ **HAYIR**☐

1b. Ağrıya sebep olan eklem rahatsızlıkları, yakın zamandaki kırık, kemik erimesi veya kansere bağlı bir kırık, omur kayması (ör. spondilolistesis) ve/veya spondilolisis/pars defekti (omurganın arkasındaki kemik halkada çatlak) var mı?
EVET☐ **HAYIR**☐

1c. Düzenli olarak 3 aydan uzun süreyle steroid (kortizon vb.) iğnesi veya steroid hapı kullandınız mı? **EVET**☐ **HAYIR**☐

---

2. Herhangi bir çeşit Kanseriniz var mı? Varsa aşağıdaki soruları yanıtlayın, **Yok**☐ ise 3. soruya geçin.

2a. Kanser tanınız şu tiplerden biri mi: akciğer/bronş, multipl miyelom (plazma hücreli kanser), baş ve boyun? **EVET**☐ **HAYIR**☐

2b. Halen kanser tedavisi alıyor musunuz (kemoterapi veya radyoterapi gibi)?

EVET☐ **HAYIR**☐

---

3. Koroner Arter Hastalığı, Kalp Yetmezliği veya Tanı almış Kalp Ritim Bozukluğuna bağlı bir Kalp veya Kalp-Damar hastalığınız var mı?

Varsa aşağıdaki soruları yanıtlayın, **Yok**☐ ise 4. soruya geçin.

3a. İlaçlarla veya hekiminizin verdiği başka tedavilerle hastalığınızı kontrol etmekte zorlanıyor musunuz? (Şu an ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın)
EVET☐ **HAYIR**☐

3b. Tıbbi tedavi gerektiren düzensiz bir kalp atımınız var mı? (ör. atrial fibrilasyon, erken ventriküler vuru) **EVET☐ HAYIR☐**

3c. Kronik (sürekli) kalp yetmezliğiniz var mı? **EVET☐ HAYIR☐**

3d. Koroner arter (kalp-damar) hastalığı olan ve son 2 ayda düzenli egzersiz yapmayan bir hasta mısınız? **EVET☐ HAYIR☐**

---

4. Yüksek Tansiyonunuz var mı? Varsa aşağıdaki soruları yanıtlayın,

Yok☐ ise 5. soruya geçin.

4a. İlaçlarla veya hekiminizin verdiği başka tedavilerle hastalığınızı kontrol etmekte zorlanıyor musunuz? (Halen ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın)

EVET☐ HAYIR☐

4b. İstirahatteki tansiyonunuz ilaçlı ya da ilaçsız 160/90 mmHg 'ye eşit ya da üzerinde

mi? (İstirahatteki tansiyonunuzu bilmiyorsanız **EVET** yanıtlayın) **EVET☐ HAYIR☐**

---

5. Tip-1 Diyabet, Tip-2 Diyabet veya Pre-Diyabet (gizli şeker) gibi herhangi bir metabolik hastalığınız var mı?

Varsa aşağıdaki soruları yanıtlayın, **Yok☐** ise 6. soruya geçin.

5a. Yiyecekler, ilaçlar veya doktorun verdiği diğer tedavilerle kan şeker düzeyinizi ayarlamakta sıklıkla zorlanıyor musunuz? **EVET☐ HAYIR☐**

5b. Günlük yaşantınız esnasında ve/veya egzersizi takiben sıklıkla düşük kan şekeri (hipoglisemi) 'nin belirti veya bulgularını yaşar mısınız? Hipogliseminin işaretleri; titreme, sinirlilik, beklenmedik huzursuzluk, anormal terleme, baş dönmesi ya da göz kararması, kafa karışıklığı, konuşma güçlüğü, halsizlik ve uyuklama olabilir.

EVET☐ HAYIR☐

5c. Kalp veya damar hastalığı ve/veya gözlerinizi, böbreklerinizi etkileyen komplikasyonlar **VEYA** ayak ve ayak parmaklarında his değişikliği gibi diyabet

komplikasyonlarının belirti ve bulgularından herhangi biri var mı? **EVET☐** **HAYIR☐**

5d. Başka metabolik hastalığınız var mı (mevcut gebeliğe bağlı diyabet, kronik [sürekli] böbrek yetmezliği veya karaciğer sorunları gibi)? **EVET☐** **HAYIR☐**

5e. Yakın zamanda alışılmadık şekilde yüksek (veya ağır) şiddette egzersize başlamayı planlıyor musunuz? **EVET☐** **HAYIR☐**

---

6. Alzheimer, Demans (bunama), Depresyon, Anksiyete Bozukluğu, Yeme Bozukluğu, Psikotik Bozukluk, Zihinsel Engellilik, Down Sendromu gibi bir Ruh Sağlığı Sorununuz veya Öğrenme Güçlüğünüz var mı? Herhangi biri **Varsa** aşağıdaki soruları yanıtlayın, **Yok☐** ise 7. soruya geçin.

6a. İlaçlarla veya hekiminizin verdiği başka tedavilerle hastalığınızı kontrol etmekte zorlanıyor musunuz? (Halen ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın) **EVET☐** **HAYIR☐**

6b. Yukarıdaki hastalıklarla birlikte sinirleri veya kasları etkileyen sırt-bel rahatsızlığınız var mı? **EVET☐** **HAYIR☐**

---

7. Kronik Obstrüktif Akciğer Hastalığı (KOAH), Astım veya Pulmoner Hipertansiyon gibi solunum hastalığınız var mı? Varsa aşağıdaki soruları yanıtlayın, **Yok☐** ise 8. soruya geçin.

7a. İlaçlarla veya hekiminizin verdiği başka tedavilerle hastalığınızı kontrol etmekte zorlanıyor musunuz? (Halen ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın)

EVET☐ **HAYIR☐**

7b. Doktorunuz size hiç istirahat veya egzersiz sırasında kan oksijen düzeyinizin düşük olduğunu ve/veya takviye oksijen tedavisine ihtiyaç duyduğunuzu söyledi mi?

EVET☐ **HAYIR☐**

7c. Astımlıysanız; halen göğüs sıkışması, hırıltılı solunum, nefes darlığı, inatçı öksürük (haftada 2 günden fazla) şikâyetleriniz var mı, ya da geçen hafta ani nefes sıkışmasında alınacak ilacı iki kezden fazla kullandınız mı? **EVET☐** **HAYIR☐**

7d. Doktorunuz size hiç akciğerlerinizin kan damarlarında yüksek tansiyonunuz olduğunu söyledi mi? **EVET☐** **HAYIR☐**

8. Spinal Kord (Omurga) yaralanmasına bağlı Tetrapleji (Her iki kol ve bacağın felci) veya Parapleji (Belden aşağı felç) var mı? Varsa aşağıdaki soruları yanıtlayın,
Yok☐ ise 9. soruya geçin.

8a. İlaçlarla veya hekiminizin verdiği başka tedavilerle hastalığınızı kontrol etmekte zorlanıyor musunuz? (Halen ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın)

EVET☐ **HAYIR**☐

8b. Sıklıkla baş dönmesi, göz kararması ve/veya baygınlığa sebep olacak kadar önemli istirahat kan basıncı düşüklüğü olur mu? **EVET**☐ **HAYIR**☐

8c.Doktorunuz size ani yüksek tansiyon atakları (Otonomik Disrefleksi) yaşadığınızı belirtti mi? **EVET**☐ **HAYIR**☐

---

9. İnme 'ye bağlı Geçici İskemik Atak veya Serebrovasküler Olay geçirdiniz mi? Geçirdiyseniz aşağıdaki soruları yanıtlayın, **Geçirmediyseniz**☐ 10. soruya geçin.

9a. İlaçlarla veya hekiminizin verdiği başka tedavilerle hastalığınızı kontrol etmekte zorlanıyor musunuz? (Halen ilaç veya başka tedavi almıyorsanız **HAYIR** yanıtlayın)
EVET☐ **HAYIR**☐

9b. Yürüyüş veya hareketlerinizde herhangi bir problem var mı? **EVET**☐
HAYIR☐

9c. Son 6 ayda sinir veya kaslarınızda felç veya zayıflık yaşadınız mı? **EVET**☐
HAYIR☐

---

10. Yukarıda listelenmemiş başka herhangi tıbbi durumunuz var mı, veya iki ya da daha fazla tıbbi hastalığınız var mı? Varsa aşağıdaki soruları yanıtlayın, **Yok**☐ ise son sayfadaki önerileri okuyun.

10a. Son 12 ayda kafa travması sonucunda kendinden geçme, baygınlık veya bilinç kaybı yaşadınız mı **VEYA** son 12 ayda beyin sarsıntısı tanısı aldınız mı? **EVET**☐
HAYIR☐

10b. Listede yer almayan tıbbi durumunuz var mı (epilepsi [sara], nörolojik hastalıklar, böbrek problemleri gibi)? **EVET**☐ **HAYIR**☐

10c. Şu an iki veya daha fazla tıbbi hastalığınız var mı? **EVET**☐ **HAYIR**☐

LÜTFEN TIBBİ HASTALIKLARINIZI VE İLİŞKİLİ HER İLACI YAZINIZ:

K. CONSENT FORM

Bu çalışma ODTÜ Beden Eğitimi ve Spor Bölümü doktora öğrencisi Özlem ASLAN tarafından yürütülmektedir. Bu form araştırma koşulları hakkında bilgi vermek için hazırlanmıştır.

Çalışmanın Amacı Nedir?

Araştırmanın amacı **çevrimiçi** ve **yüz yüze yoga** eğitimlerinin genç yetişkin kadın bireylerde; beden, sağlık ve ruhsal durum üzerindeki etkilerini karşılaştırmaktır. Yoga çalışmalarının; denge, güç, esneklik, vücut kompozisyonu (BMI) ve vücut yağ oranı ile algılanan sağlık durumu, algılanan stres, yoga öz yeterlilik ve durumluk ve sürekli kaygı düzeyinde gözlemlenebilir bir etki yaratıp yaratmadığı noktasında incelenecektir.

Testlere ve çalışmaya başlamadan önce sağlık taraması için Egzersize Hazırbulunuşluk ile Uluslararası Fiziksel Aktivite (Kısa Form) anketlerinin doldurulması istenilecektir.

Testlerin Açıklaması

Katılım sağlamanız durumunda tüm çalışma grubu fizyolojik ölçümlere tabi tutulacaktır. Fizyolojik testler ODTÜ Beden Eğitimi ve Spor Bölümü Anatomi Laboratuvarında yapılacaktır.

Uygulanacak testler; vücut kompozisyonu ölçümü, esneklik ve güç testleridir. Vücut kompozisyonu için boy, kilo ve vücut yağ oranı ölçümleri yapılacaktır. Denge ölçümü için tek ayak denge testi göz açık ve göz kapalı olarak uygulanacaktır. Esneklik için otur-uzan ve sırt germe testi ölçümlerine bakılacaktır. Güç ölçümünde el kavrama gücü testi ve mekik testi yapılacaktır.

Fiziksel testlerin yanında aşağıdaki anketler sırasıyla verilecektir: Uluslararası Fiziksel Aktivite Anketi, Egzersize Hazırbulunuşluk Anketi, Algılanan Sağlık Anketi; Durumluk ve Sürekli Kaygı Anketi, Algılanan Stres Anketi; Yoga Öz Yeterlik Anketi. Bu anketlerin dışında yararlanıcılara nihai dönemde yoga hakkında açık uçlu sorular yönetilecektir.

Testler ve anketler yoga çalışması başlamadan önce ve çalışmaların tamamlanmasını müteakip olmak üzere iki kez uygulanacaktır.

Riskler ve Beklenmeyen Durumlar

Çalışma, genel olarak kişisel rahatsızlık verecek riskler içermemektedir. Çalışmanın tamamı için ODTÜ Etik Kurulu'ndan Etik Onay İzni alınmıştır. Ancak, katılım sırasında yoga çalışmalarından, anket sorularından ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz araştırmadan çıkmakta serbestsiniz. Böyle bir durumda çalışmayı uygulayan kişiye, çalışmadan çıkmak istediğinizi söylemeniz yeterli olacaktır.

Testlerin de herhangi bir riski bulunmamaktadır. Kas kondisyonu, esneklik ve denge testi sırasında hafif bir kas çekme olasılığı vardır. Testten 24 veya 48 saat sonra kas ağrısı yaşayabilirsiniz. Testlere girmeden tarafınıza gönderilen beslenme

programına uyarak ve ısınma egzersizlerini yaparak bu riskleri en aza indirebilirsiniz. Kas ağrısı oluşursa, bu ağrıyı hafifletmek için uygun germe egzersizleri, gönderilen bilgilendirmede bulunan programa uygun olarak yapılmalıdır.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırmaya katılmayı kabul etmeniz durumunda 3 gruptan birine tahsis edileceksiniz. Kontrol grubu katılımcıları herhangi bir eğitim almayacak; yüz yüze ve çevrim içi grup katılımcıları yoga eğitimi alacaktır. Katılımcılar gruplara tesadüfi atama yöntemi ile tahsis edilecektir. Yüz yüze yoga eğitimleri ODTÜ Teknokent Spor Salonu'nda verilecektir. Çevrim içi yoga eğitimlerine katılımcılar Zoom programı üzerinden bağlanacaklardır. Yoga matları katılımcıların (online ve yüz yüze yoga eğitimlerini alan) kendileri tarafından sağlanacaktır. Eğitimler 8 hafta, hafta iki gün ve birer saattir.

Kontrol grubu herhangi bir eğitim almayacak ancak tüm testlere katılacaklar ve anketleri dolduracaklardır.

Çalışma bittikten 4 ay sonra, yoga eğitimi alan tüm katılımcılara yogaya devam edip etmedikleri sorulacaktır.

Katılımınızla ilgili bilmeniz gerekenler:

Bu çalışmaya katılmak tamamen gönüllülük esasına dayalıdır. Herhangi bir yaptırıma veya cezaya maruz kalmadan çalışmaya katılmayı reddedebilir veya çalışmayı bırakabilirsiniz. Araştırma esnasında cevap vermek istemediğiniz sorular olursa boş bırakabilirsiniz.

Çalışmaya katılım sağlayan kişiler 8 hafta boyunca;

- ☐ Günlük yürüyüşleri dışında herhangi bir spor faaliyetine (eşli danslar, yüzme, koşu, bisiklet, pilates,…) katılmamalı,
- ☐ Çalışma dışında yoga yapmamalı,
- ☐ Normal beslenme rutinlerine devam etmeli ve bir diyet değişikliğine **gitmemelidirler.**

Sorularınız

Fiziksel uygunluk testlerinde kullanılan prosedürler hakkında soru sormanız teşvik edilmektedir. Herhangi bir sorunuz varsa veya ek bilgiye ihtiyacınız varsa, lütfen bizden daha fazla açıklama yapmamızı isteyin.

Rıza Özgürlüğü

Bu çalışmayla ilgili olarak; 8 haftalık yoga çalışmasına, fiziksel uygunluk testlerine ve anketlere izin vermeniz kesinlikle gönüllülük esasına dayanmaktadır. Arzu ettiğiniz takdirde testleri herhangi bir noktada durdurmakta özgürsünüz.

Araştırmaya katılanlardan toplanan veriler tamamen gizli tutulacak, veriler ve kimlik bilgileri herhangi bir şekilde eşleştirilmeyecektir. Ayrıca toplanan verilere sadece araştırmacı ulaşabilecektir. Katılımcıların kimliği gizli tutulmak kaydı ile araştırmanın sonuçları bilimsel ve profesyonel yayınlarda veya eğitim amaçlı kullanılabilir.

Yukarıdaki bilgileri okudum. Benden istenenlere riayet edeceğim ve bu çalışmaya tamamen gönüllü olarak katılıyorum.

(Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

Ad/Soyad Tarih

İmza

---/----/-----

L. 8 WEEKS YOGA PROGRAM

	1st week	2nd week
Warm-Up Series	**Start course in Swastikasana (3* Om Chants)** Adho Mukha Virasana to Adho Mukha Svasanasa Uttanasana in baddanguliyasana Samasthiti Tadasana Urdhva Hastasana to Utkatasana Uurdhva Baddanguliyasana Namaskarasana to Urdhva Namaskarasana Namaskarasana to Urhdva Hastasana	**Start course in Swastikasana (3* Om Chants)** Adho Mukha Virasana to Adho Mukha Svasanasa Uttanasana in baddanguliyasana Samasthiti Tadasana Urdhva Hastasana to Utkatasana Uurdhva Baddanguliyasana Namaskarasana to Urdhva Namaskarasana Urdhva Namaskarasana to Urhdva Hastasana
Strength-Stretching-Balance Series	Gomukasana Uthita Hasta Padasana Parshva Hasta Padasana Utthita Trikonasana Virabhadrasana II Parshva Konasana (hands on the waist) Vrksasana Urdhva Prasaritta Padasana	Gomukasana Variations (Belt Usage and walk) Uthita Hasta Padasana Parshva Hasta Padasana Utthita Trikonasana Virabhadrasana II Parshva Konasana (hands on the waist) Virabhadrasana I Prasaritta Padottanasana (Head down-Concave back)

Cool-Down	Eka Pada Pawan Muktasana Dwi Pada Pawan Muktasana Jathara Parivatasana Variation Supta-Padangustasana I	Eka Pada Pawan Muktasana Dwi Pada Pawan Muktasana Dandasana Urdhva Hasta Dandasana Padangustha Dandasana Paschimottanasana Chatuspadasana Setu as Bandha Sarvangasana
Pranayama	10 Min Pranayama (Observe breathing-10 min)	10 Min Pranayama(Observe breath where it starts where it ends)
Shavasana-Meditatiton	Shavasana (5 min)	Shavasana (5 min)

	5th week	**8th week**
	Start course in Swastikasana (3* Om Chants)	**Start course in Swastikasana (3* Om Chants)**
Warm-Up Series	Parshva Swastikasana Adho Mukha Virasana to Adho Mukha Svasana Samasthiti Tadasana (with weight) Urdhva Hastasana to Utkatasana (with weight) Utkatasana to Urdhva Namaskarasana (with weight) Namaskarasana to Urhdva Hastasana (with weight)	Parshva Swastikasana (wall) Adho Mukha Svanasana (heels on wall) Eka Pada Adho Mukha Shavanasana (heels on wall) Adho Mukha Svanasana (palms on wall) Surya Namaskar *3 to Urdhva Prasaritta Eka Padasana

Strength-Stretching-Balance Series	Uthita Hasta Padasana (with weight) Parshva Hasta Padasana (with weight) Utthita Trikonasana (with weight) Virabhadrasana II (with weight) Parshva Konasana (with weight) Ardha Chandrasana (with weight) Virabhadrasana I (with weight) Parshvottanasana (with weight) Prasaritta Padottasana (with weight)	Uthita Hasta Padasana (wall) Parshva Hasta Padasana (wall) Utthita Trikonasana (wall) Virabhadrasana 2 (wall) Parshvakonasana (wall) Ardha Chandarasana (wall) Virabhadrasana 1 (wall) Prasaritta Padottasana (wall) Eka Pada Adho Mukha Shavanasana (heels on wall) Ardha Adho Mukha Vrksasana (wall)
Cool-Down	Dandasana Urdhva Hasta Dandasana Padangustha Dandasana Paschimottanasana Trianga Mukha Eka Pada Marcihiasana Leg Forward Fall Salamba Sarvangasana (on the wall) Dwi Pada Pawan Muktasana	Bharadvasajana I (wall) Salamba Sarvangasana (on the wall and hands on the lower back)) Paschimottanasa (wall) Janu sirshasana (wall) Supta badha konasana(Wall)
Pranayama	10 Min Ujayi (Observe breath space: abdomen diaphram and chest)	10 Min Ujayi 3
Shavasana-Meditatiton	Shavasana (5 min.)	Shavasana (5 min.)

M. ADHERENCE TO YOGA QUESTIONNAIRE (AYQ)

1. Which group were you in?

- Online
- In-person

3. We started the study one year ago. Are you still practicing yoga?

- Yes, regularly
- Yes, but not very often
- No

4. Where did you practice yoga?

- At home (online, via YouTube, NIKE apps, etc.)
- Outdoors (in-person, group sessions, studio, etc.)

5. Have you started a new sport in the past year? ***(Excluding daily walks)***

- Yes
- No

6. Which sport(s) did you start? ***(Open-ended response)***

N. DESCRIPTIVE SUMMARY OF WITHIN-GROUP PRE-POST CHANGES

TESTS (Units)	Groups	Pre (Mean ± SD)	Post (Mean ± SD)	Mean Differences	Mean Change (%)
HGST (Kg)	In-Person	48.99±8.96	53.40 ±6.65	4.41	9.01
	Online	49.98± 8.17	53.34 ±9.15	3.36	6.71
	Control	48.57 ±7.88	50.13± 8.13	1.56	3.21
Sit-Up (Number)	In-Person	17.37±4.90	21.05± 4.54	3.68	21.20
	Online	17.79 ±5.38	20.84 ±3.64	3.05	17.13
	Control	17.79 ±6.24	19.26 ±7.19	1.47	8.27
DLEO(Seconds)	In-Person	39.68 ± 8.15	43.61 ± 3.08	3.92	9.90
	Online	42.42 ± 7.34	44.74±1.15	2.32	5.50
	Control	43.42 ± 3.54	39.32±9.86	-4.1	-9.40
Non_DLEO (Seconds)	In-Person	38.39 ± 10.52	38.05±12.69	-0.34	-0.90
	Online	43.76 ± 2.50	44.71 ± 0.87	0.95	2.20
	Control	40.00 ± 10.18	39.47±10.85	-0.53	-1.30
DLEC (Seconds)	In-Person	6.18±5.74	10.37±6.98	4.18	67.70
	Online	8.16±8.28	9.76±8.19	1.61	19.70
	Control	6.95 ± 9.05	9.89±11.96	2.95	42.4
Non_DLEC (Seconds)	In-Person	4.97 ± 2.46	6.50±5.44	1.53	30.70
	Online	6.51 ± 5.65	10.58 ± 9.46	4.07	62.40
	Control	7.53 ± 6.74	6.29 ± 4.74	-1.24	-16.40
SRT (Cm)	In-Person	25.27±8.71	29.60±7.58	4.33	17.14
	Online	22.34±6.30	27.23±6.18	4.89	21.89
	Control	23.83±8.01	23.11±8.44	–0.72	-3.02
BSTLeft (Cm)	In-Person	2.79±6.03	5.66±6.46	2.87	102.87
	Online	0.42±7.22	1.71±7.99	1.29	307.14
	Control	3.87±5.48	4.19±5.63	0.32	8.27
BST_Right (Cm)	In-Person	5.95±5.76	8.94±5.91	2.99	50.25
	Online	4.70±8.05	6.68±6.00	1.98	42.13
	Control	7.34±4.66	7.21±5.36	–0.13	–1.77
BMI (kg/m2)	In-Person	22.24±3.72	22.70±3.66	0.46	2.07
	Online	20.71±3.60	21.44±3.99	0.73	3.52
	Control	21.35±2.40	22.10±2.22	0.75	3.51

FAT (%Fat)	In-Person	26.82±7.06	27.71±6.95	0.89	3.32
	Online	25.35±7.10	26.45 ± 7.31	1.11	4.36
	Control	27.22 ± 5.96	28.16±4.89	0.95	3.48
Perceived Stress (Scale Score)	In-Person	33.05 ± 6.03	26.42±7.30	-6.63	-20.06
	Online	29.16 ± 7.33	24.95±6.79	-4.21	-14.44
	Control	30.37 ± 6.10	33.31 ± 7.54	2.94	9.68
Perceived Health (Scale Score)	In-Person	2.00±0.75	2.11±0.66	0.11	5.5
	Online	2.05±0.71	1.84±0.77	-0.21	-10.24
	Control	2.26±0.81	2.53±0.77	0.27	11.95
YSE_Body (Scale Score)	In-Person	15.00 ± 4.23	17.84 ± 3.75	2.84	18.93
	Online	16.21±3.85	17.68±3.16	1.47	9.07
	Control	14.68±3.45	13.68±4.08	-1.0	-6.81
YSE_Breath (Scale Score)	In-Person	13.74 ± 3.03	15.47±2.32	1.73	12.59
	Online	13.11±3.38	14.58±2.43	1.47	11.21
	Control	13.47±3.06	11.74±3.02	-1.73	-12.84
YSE_Mind (Scale Score)	In-Person	10.32±2.14	11.42±2.14	1.1	10.66
	Online	10.26±2.66	10.84±2.17	0.58	5.65
	Control	9.37±2.27	8.58±2.67	-0.79	-8.43
YSE_ TOTAL (Scale Score)	In-Person	39.05±8.00	44.74 ±6.66	5.69	14.57
	Online	39.58 ± 8.43	43.11±6.70	3.53	8.92
	Control	37.53±7.37	34.00±7.32	-3.53	-9.41

O. OVERALL RESULTS OF QUANTITATIVE DATA

Measure	*Variable*	*Between Grpop Dif.*				*Within-Group Changes*			
						Wilcoxon Signed Rank			*Chi-Sq.*
		KW_ Pre	*KW_ Post*	*Dunn's Post Hoc*	*Chi-Sq.*	IPG	OG	CG	
HGST	Stre.	N.S.	N.S.	-		0.003*	0.003*	0.23	
Sit_Up	Stre.	N.S.	N.S.	-		0.002*	<0.001*	0.34	
DLEO	Bal.	N.S.	0.02*	CG vs OG (p=0.005*)		0.46	0.27	0.01*	
DLEC	Bal.	N.S.	N.S.	-		*0.04	0.24	0.28	
Non_DLEO	Bal.	N.S.	N.S.	-		0.63	0.09	0.42	
Non_DLEC	Bal.	N.S.	N.S.	-		0.30	0.03*	0.45	
SRT	Flex.	N.S.	N.S.	-		0.001*	0.001*	0.07	
BST-Left	Flex.	N.S.	N.S.	-		0.001*	0.03*	0.45	
BST-Right	Flex.	N.S.	N.S.	-		0.001*	0.02*	0.53	
BMI	B.C.	N.S.	N.S.	-		0.009*	0.001*	0.002*	
Fat %	B.C.	N.S.	N.S.	-		0.014*	0.002*	0.031*	
P. Stress	P. St.	N.S.	*p*=.006*	IPG vs CG (p=0.02*)		0.006*	0.02*	0.14	
P. Health	P. He.	-	-	-	Post (p=0.036*)	-	-	-	N.S.
Body	S.-Eff.	N.S.	*p*=.002*	IPG vs CG (p=.001*) OG vs CG (*p*=0.004*)		0.03*	0.051	0.22	
Breath	S.-Eff.	N.S.	*p*=.001*	IPG vs CG (*p*.<0.001*) OG vs CG (*p*=0.006*)		0.06	0.05*	0.03*	
Mind	S.-Eff.	N.S.	*p*=.003*	IPG vs CG (p=0.003*) OG vs CG (p=0.005*)		0.07	0.19	0.21	
Total	S.-Eff.	N.S.	p= .001*	IPG vs CG (p<0.001*) OG vs CG (p=0.002*)		0.013*	0.019*	0.052	

***Note**:* Stre. =Strength; Bal.=Balance; Flex. =Flexibility; B.C.=Body Composition; P.St.=Perceived Stress; S.-Ef. =Self-Efficacy; N.S.=Non-Siginificant; KW= Kruskal Wallis; IPG= In-Person Group, OG=Online Group CG= Control GrouP

P. ATTENDANCE LIST

IN-PERSON ATTANDANCE LIST	**1st**		**2nd**		**3rd**		**4th**		**5th**		**6th**		**7th**			**8th**		
	1st **4/11**	2nd **8/11**	1st **11/11**	2nd **15/11**	1st **18/11**	2nd **22/11**	1st **25/11**	2nd **29/11**	1st **2/12**	2nd **6/12**	1st **9/12**	2nd **13/12**	1st **16/12**	**EK* 17/12**	2nd **20/12**	1st **23/12**	**EK* 24/12**	2nd **27/12**

ONLINE ATTENDANCE LIST	1st			2nd			3rd			4		5th		6th		7th			8th		
	31/10	2/11	4/11	7/11	9/11	11/11	14/11	16/11	18/11	21/11	23/11	28/11	30/11	5/12	7/12	12/12	14/12	16/12	19/12	23/12	26/12

R. FIDELITY OF INTERVENTION CHECKLIST (IN-PERSON AND ONLINE)

	Course Start Time	Warm-Up Exercises	Cool-Down Exercises	45-Min. Yoga Poses	10 Min. Breathing Practice	5 Min. Shavasana-Meditation	Demonstration of Newly Added Pose	Explanatory Instruction	Providing Feedback	Lesson Plan Adherence	Answering Questions
1. Class Date:											
2. Class Date:											
3. Class Date:											
4. Class Date:											
5. Class Date:											

S. CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Aslan, Özlem

EDUCATION

Degree	Institution	Year of Graduation
MS	Selçuk University/City and Regional Planning	2005
BS	Middle East Technical University/City and Regional Planning	2001
High School	Trabzon Yomra Fen Lisesi	1995

WORK EXPERIENCE

Date From-To	Position, Company
11.01.2011- Present	Monitor and Evaluation Expert, Ankara Development Agency
11.04.2006 – 11.01.2011	Town Planner, The Ministry of Public Works and Settlements
18.07.2005- 10.04.2006	SMEs Unit Coordinator, Konya and Karaman Provinces Service Unions/ Project Implementation Unit (PIU)
27.03.2004- 15.07.2005	SMEs Unit Coordinator, Erzincan and Bayburt Provinces Service Unions/ Project Implementation Unit (PIU)
15.11.2003- 08.03.2004	EIC Expert, Konya Euro Info Center (EIC)

BOOK CHAPTERS

Aslan, Özlem. "Bölgesel Kalkınma Ajanslarının Kırsal Kalkınmadaki Rolü ve Etkinlikleri: İngiltere Örneği", Türkiye'de Bölgesel Kalkınmanın Yeni Örgütleri Kalkınma Ajansları, (Ed. Birol Akgül ve Nısfet Uzay), Ekin Yayınevi, Bursa, 2010

FOREIGN LANGUAGE

English

T. TURKISH SUMMARY / TÜRKÇE ÖZET

GİRİŞ

Bu bölümde araştırmanın kuramsal temeli, amacı, önemi ve araştırma soruları ortaya konulmuştur. Son yıllarda yoga, bireylerin fiziksel, zihinsel ve ruhsal yönlerini bütünleştiren etkili bir zihin-beden müdahalesi olarak dikkat çekmektedir (Büssing et al., 2012; Feuerstein, 2001). Yoga; asanalar (duruşlar), pranayama (nefes egzersizleri) ve meditasyon tekniklerini bir arada sunarak beden-zihin uyumunu destekler (Feuerstein, 2001; Iyengar, 1988; Mohanty, 2020). Geleneksel Hint felsefesine dayanan bu uygulama, kültürel ve coğrafi sınırları aşarak küresel ölçekte fiziksel sağlık, stres azaltımı ve psikolojik dayanıklılığı destekleyen bir yöntem olarak benimsenmiştir (Gard et al., 2012; Ross et al., 2010; Yoshihara et al., 2014).

Düzenli yoga pratiğinin stresi azalttığı, ruh hâlini iyileştirdiği ve öz yeterliliği artırdığı pek çok çalışmada gösterilmiştir (Büssing et al., 2012; Cohen et al., 1983). Ayrıca, sağlıklı alışkanlıkları teşvik ettiği ve özellikle kadınlarda beden imgesini olumlu yönde etkilediği vurgulanmıştır (Neumark-Sztainer et al., 2018). Bu önemlidir çünkü beden imgesi sorunları, kaygı ve depresyonla yakından ilişkilidir (Bucchianeri et al., 2013). Yoga, obezite ile yaşayan bireylerde stres düzeyini ve yaşam kalitesini iyileştirmekte de etkilidir (Lauche et al., 2016; Telles et al., 2019).

Yoga, yalnızca psikolojik değil aynı zamanda fiziksel uygunluk açısından da önemli etkiler sunar. Yapılan araştırmalar, yoganın kas kuvveti, kardiyovasküler dayanıklılık, esneklik ve vücut kompozisyonu gibi sağlıkla ilişkili fiziksel uygunluk bileşenlerini olumlu yönde etkilediğini göstermektedir (Ross et al., 2010; Tran et al., 2001). Ayrıca denge, koordinasyon ve çeviklik gibi beceri temelli bileşenleri de geliştirdiği ve bu yolla işlevsel özerklik ve yaşam kalitesine katkı sunduğu vurgulanmaktadır (Gonçalves et al., 2011; Jeter et al., 2015; Woodyard, 2011). Bu etkiler, yoga pozlarında gerekli olan postüral kontrol, propriyosepsiyon, odaklanmış

dikkat ve yapılandırılmış nefes teknikleri ile açıklanabilir (Balasubramaniam et al., 2013; Büssing et al., 2012).

Yapılan çalışmalar, yoga uygulamalarının geniş bir katılımcı yelpazesiyle yürütüldüğünü ortaya koymaktadır (Cramer et al., 2014). Ancak bu çalışmanın da odağında bulunan genç yetişkin kadınlar, özgün fizyolojik ve psikolojik zorluklar (hormonal dalgalanmalar, yüksek stres, toplumsal baskılar) nedeniyle ayrı bir grup olarak ele alınmayı hak etmektedir (Matud, 2004; Riley et al., 2015). Bu yaş grubu, yaşam boyu sürecek sağlık davranışlarının yerleşmesi açısından kritik bir dönemdedir (Dishman et al., 2013). Yoga, bu dönemde fiziksel uygunluğu artırmak, olumlu beden algısı geliştirmek ve psikolojik dayanıklılık kazandırmak yoluyla genç kadınların başa çıkma becerilerini güçlendirebilir (Neumark-Sztainer et al., 2018).

Yoga uygulamalarında en çok başvurulan stillerden biri olan hatha yoga, beden-zihin dengesini sağlamaya yönelik asanalar, nefes ve meditasyonu bir arada sunar (Feuerstein, 2008). Bu çalışmada tercih edilen Iyengar yoga ise B.K.S. Iyengar tarafından geliştirilen, hizalanma, yardımcı malzeme kullanımı ve sistematik poz dizilimiyle öne çıkan bir hatha yoga disiplinidir (Iyengar, 2005). Bu stil, farklı fiziksel yeterlik düzeylerine sahip bireyler için erişilebilir oluşu, bilimsel yaklaşımda ön plana çıkması ve beden farkındalığına yaptığı vurgu nedeniyle tercih edilmiştir (Kolasinski et al., 2005; Shapiro et al., 2004; Speed-Andrews et al., 2012).

Yoga öğretiminde yöntemsel çeşitlilik son yıllarda hızla artmıştır. Pandemi sürecinde yüz yüze eğitimlerin yerini çevrimiçi uygulamalar almış, bu dönüşüm yogayı da etkilemiştir. Acil uzaktan öğretim kapsamında çevrimiçi platformlar (Zoom, Skype gibi) yaygın şekilde kullanılmaya başlanmıştır (Agormedah et al., 2020; Dhawan, 2020). Özellikle genç yetişkinler için bu yöntem, çalışma ve eğitim yaşamıyla kolayca entegre edilebildiği için pratik bulunmuştur (Nandlall et al., 2022). Bu nedenle çevrimiçi yoga, araştırmalar açısından da yeni bir inceleme alanı haline gelmiştir (Jagannathan et al., 2021; James et al., 2022; Strömberg et al., 2021). Ancak çevrimiçi yoga uygulamalarının etkinliği konusunda hâlâ bazı belirsizlikler bulunmaktadır (Suman et al., 2021; Telles et al., 2020).

Araştırmanın önemi, hem uluslararası hem de Türkiye literatürüne katkı potansiyeliyle öne çıkmaktadır. Türkiye Ulusal Tez Merkezi verilerine göre 1998–2025 arasında yoga konulu 170 yüksek lisans ve doktora tezi yapılmış; bunların çoğu fiziksel sağlık ve stres konularına odaklanmıştır. Ancak yalnızca altı çalışmanın çevrimiçi yoga konusunu ele aldığı, ancak bu çalışmaların da yüz yüze ve çevrimiçi programları karşılaştırma bağlamında ele alınmadığı görülmektedir (Ulusal Tez Merkezi, 2025). Bu yönüyle çalışma, literatürdeki önemli bir boşluğu doldurmaktadır.

Bu bağlamda, çalışmanın temel amacı; yüz yüze ve çevrimiçi olarak sunulan hatha temelli Iyengar yoga programlarının genç yetişkin kadınlarda fiziksel uygunluk (kuvvet, denge, esneklik, vücut kompozisyonu), algılanan sağlık, algılanan stres, yoga öz yeterliliği ve bir yıl sonraki yogaya katılım üzerindeki etkilerini karşılaştırmalı olarak incelemektir. Ayrıca, katılımcıların kişisel deneyim ve algılarının nitel analizle değerlendirilmesi hedeflenmiştir.

Araştırma soruları beş boyutta ele alınmıştır:

1. **Gruplar Arası Farklar**: Yüz yüze, çevrimiçi ve kontrol grubu arasında fiziksel uygunluk (kuvvet, denge, esneklik, vücut kompozisyonu), algılanan sağlık, algılanan stres ve yoga öz yeterliliği açısından anlamlı fark var mı?
2. **Grup İçi Değişimler:** Her grup içinde (yüz yüze, çevrimiçi, kontrol) 8 haftalık süreçte ön test ve son test arasında fiziksel uygunluk (kuvvet, denge, esneklik, vücut kompozisyonu), algılanan sağlık, algılanan stres ve yoga öz yeterliliği açısından anlamlı değişim var mı?
3. **Katılımcı Deneyimleri**: Katılımcılar yoga deneyimlerini, fiziksel ve psikolojik etkilerini nasıl algıladı?
4. **Yoga Bağlılığı (1 Yıl Sonra)**: Yüz yüze ve çevrimiçi grupların bir yıl sonraki yoga yapma durumları (hiç yapmama, ara sıra yapma, düzenli yapma) arasında anlamlı fark var mı?
5. **Karma Yorum:** Nicel ve nitel bulgular birlikte değerlendirildiğinde, yoga müdahalesinin genel etkisi nasıl açıklanabilir?

Hipotezler, fiziksel ve psikolojik değişkenlere dair grup ve zaman etkisini test etmeye yönelik araştırma sorularına uygun olarak hazırlanmıştır.

LİTERATÜR ÖZETİ

Yoga'nın kökenleri, M.Ö. 2700'lere kadar uzanan tarihsel süreçte Vedalar, Patanjali'nin Yoga Sutraları ve diğer klasik metinler üzerinden açıklanmıştır (Feuerstein, 1999; McGonigal, 2010; Flood, 2003). Yoga "birleşme" anlamına gelen "yuj" kökünden türemiştir ve beden-zihin-ruh birliğini ifade eder (Feuerstein, 1999; Iyengar, 1988). Patanjali'nin sekiz basamaklı yoga sistemi (Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana, Samadhi) terapötik ve spiritüel gelişimi destekleyen bütünsel bir çerçeve sunar (Iyengar, 2001).

Yoga'nın çeşitli ekolleri arasında hatha, raja, bhakti, jnana ve kundalini gibi yollar yer almakta olup, bu çalışmada özellikle fiziksel yönü ağır basan hatha yoga tercih edilmiştir (Khanna & Greeson, 2013; Feuerstein, 2001). Hatha yoga'nın ölçülebilir, uygulanabilir ve fiziksel temelli oluşu, araştırmalarda yaygın olarak kullanılmasını sağlamıştır (Büssing et al., 2012; Ross & Thomas, 2010).

Bu bağlamda, Iyengar yoga'nın tercih edilme nedeni; fiziksel hizalamaya verdiği önem, yardımcı ekipman kullanımı, sistematik yapısı ve terapötik etkileridir (Rajendran & Sethuraman, 2023; Rod, 2024; Williams et al., 2005; Bower et al., 2014). Iyengar yoga, özellikle yeni başlayanlar ve fiziksel ihtiyaçları farklı olan bireyler için erişilebilir ve etkili bir yöntem olarak literatürde ön plana çıkmaktadır (Cramer et al., 2013; Streeter et al., 2017).

Yoga uygulamalarının sağlık üzerindeki etkileri de kapsamlı biçimde ele alınmıştır. Hatha yoganın kuvvet, esneklik, denge ve vücut kompozisyonu gibi fiziksel uygunluk parametreleri üzerindeki olumlu etkileri farklı gruplar üzerinde gösterilmiştir (Batrakoulis, 2022; Moonaz et al., 2015; Kartal & Ergin, 2020). Algılanan sağlık, bireyin genel sağlık durumuna yönelik öznel değerlendirmesini yansıtır ve yaşam doyumu ile yakından ilişkilidir (Atchison & Gift, 1997; Liao, 2023). Yoga yapan bireylerde algılanan sağlık düzeyinin daha yüksek olduğu birçok çalışmayla ortaya konmuştur (Erkin et al., 2018; Puymbroeck et al., 2013).

Algılanan stres, kişinin yaşadığı stres düzeyine ilişkin öznel değerlendirmesidir ve yoga uygulamalarının bu alandaki olumlu etkisi birçok meta-analiz ve deneysel çalışmayla desteklenmiştir (Cramer et al., 2013; Sadawarte & Sahasrabuddhe, 2022;

Fischer et al., 2022). Öz yeterlik kavramı, Bandura'nın Sosyal Bilişsel Kuramı'na dayanmakta olup bireyin belirli bir davranışı gerçekleştirme yetisine olan inancını ifade eder (Bandura, 1986; Bandura, 2005). Yoga uygulamaları, bireylerin fiziksel, zihinsel ve sosyal alanlardaki öz yeterliklerini güçlendirmektedir (Birdee et al., 2015; Justice et al., 2016, Küçükelçi, 2019).

Son olarak, yoga öğretim yöntemleri detaylandırılmış ve yüz yüze, çevrimiçi ve hibrit eğitim modelleri karşılaştırılmıştır. Yüz yüze eğitim; geri bildirim, fiziksel yardım ve sosyal etkileşim gibi avantajlar sunsa da erişim ve maliyet yönünden sınırlayıcı olabilmektedir (Brinsley et al., 2021; Avery et al., 2021). Çevrimiçi yoga; esneklik, maliyet etkinliği ve mahremiyet gibi faydalar sunarken, doğrudan geri bildirim eksikliği ve teknik sorunlar gibi dezavantajlara sahiptir (Zheng et al., 2022; Sharma et al., 2022). Bu çalışmada hibrit modelin uygulanabilirliği yeterince incelenmemiş olduğu için çalışma kapsamına alınmamıştır (Osaili, 2023).

YÖNTEM

Araştırma Deseni

Araştırma, ön test-son test kontrol gruplu yarı deneysel bir desen kullanılarak gerçekleştirilmiştir. Nicel ve nitel verilerin eş zamanlı olarak toplandığı ve analiz edildiği yakınsayan paralel karma yöntem deseni (Creswell & Plano Clark, 2011) benimsenmiştir. Bu yaklaşım, hem ölçülebilir sonuçları hem de katılımcı deneyimlerini entegre ederek bütüncül bir anlayış sunmayı hedeflemektedir (Hesse-Biber, 2012).

Veri Toplama Süreci

Etik onaylar üç ayrı protokolle (0204-ODTUIAEK-2023; 331-ODTUIAEK-2023; 0072-ODTUIAEK-2024) alınmıştır. Etik onayların alınması sonrasında ve çalışmaya başlamadan önce tüm katılımcılardan bilgilendirilmiş onam formları imzalanarak alınmıştır. Ekim 2023'te ön testlerin uygulanmasını müteakip yoga uygulaması başlamış ve 8 haftalık müdahale programı Aralık 2023'te tamamlanmıştır. Nitel

verilere ilişkin görüşmeler, son testin bitimi sonrasında Aralık 2023 ve Ocak 2024 ilk haftasında yapılmıştır. Nicel veriler; anketler, fiziksel uygunluk bileşenleri ve psikolojik ölçeklerle toplanırken; nitel veriler, yarı yapılandırılmış görüşmeler aracılığıyla elde edilmiştir.

Katılımcılar

Çalışmaya 18–30 yaş arası, sedanter yaşam tarzına sahip, yoga deneyimi olmayan 57 kadın dahil edilmiştir. Nicel çalışma katılımcıları "uygun" ve nitel çalışma katılımcıları ise "amaçlı" örnekleme yöntemleriyle seçilmiştir. Müdahale grubu (yüz yüze ve çevrimiçi) ve kontrol grubu ön ve son testleri, eş zamanlı ama bağımsız olarak yürütülmüştür. Müdahale grubu için grup atamaları, mekânsal uygunluk ve bireysel tercihlere göre yapılmıştır. Kontrol grubuna rastgele atama yapılmamış; yoga uygulamasına başvurmayan fakat dahil edilme kriterlerini sağlayan bireylerden oluşturulmuştur. Katılımcıların çalışmaya dahil edilebilmesi için 18 ila 30 yaş arasında genç yetişkin kadın olmaları, daha önce yoga deneyimi bulunmaması ve sedanter bir yaşam tarzına sahip olmaları koşulu aranmıştır. Buna karşılık, hali hazırda yoga yapanlar veya yoga konusunda deneyim sahibi olanlar, düzenli olarak spor yapanlar, ciddi ortopedik ya da nörolojik rahatsızlıkları bulunan bireyler ve yoga uygulamasını tamamlamalarına engel teşkil edebilecek aktif kas-iskelet sistemi ağrısı yaşayanlar çalışmadan hariç tutulmuştur.

Yoga Müdahale Programı

Her iki müdahale grubu, haftada 2 gün, 8 hafta süresince 1 saatlik seanslara katılmıştır. Program; 45 dakika fiziksel yoga duruşları, 10 dakika nefes ve 5 dakika meditasyon içermektedir. Müdahale programı Geeta Iyengar'ın *Yoga: A Gem for Women* (2000) ve *Advisory on Tele Yoga Services* (2020) rehberliğinde yapılandırılmış; deneyimli iki Iyengar yoga eğitmeninden uzman görüşü alınarak revize edilmiştir. Katılımcılar için ileri seviye duruşlar (ters duruşlar, derin geriye bükülmeler vb.) ile ileri düzey nefes çalışmaları programa dahil edilmemiştir. Pozlar, öğrencilerin fiziksel seviyesine uygun biçimde yapılandırılmıştır. Her iki grup da aynı eğitmen tarafından yönetilmiş, böylece öğretim süreci boyunca içerik ve kalite açısından tutarlılık sağlanmıştır. Yüz

yüze gruplar üniversite spor salonunda çalışırken, çevrimiçi grup Zoom üzerinden katılım sağlamıştır. Her iki grup farklı saat ve günlerde yoga programına devam etmiştir. Çevrim içi grubun programı 19 katılımcı tarafından uygun görülen gün ve saatlerde; yüz yüze ise ODTÜ tarafından uygun görülen gün ve saatlerde devam etmiştir.

Veri Toplama Araçları

Çalışmada hem fiziksel hem psikolojik ölçüm araçları kullanılmıştır. Nicel ve nitel olmak üzere iki farklı veri toplama yöntemi seçilmiştir.

Fiziksel Uygunluk Testleri için; El kavrama gücü testi (HGST), 1 dakikalık mekik testi; Otur-uzan testi (SRT), Omuz esneklik testi (BST); Tek ayak denge testi (SLBT); Vücut kitle indeksi (BMI) ve yağ yüzdesi (BFP) kullanılmıştır. Psikolojik verilerin ölçülmesi bağlamında; Algılanan Sağlık Durumu Ölçeği (Erengin et al., 1997); Algılanan Stres Ölçeği (Eskin et al., 2013); Yoga Öz-Yeterliği Ölçeği (Küçükelci, 2019) ile yogaya katılım anketi kullanılmıştır. **Niteliksel Veriler için;** 24 katılımcı ile yarı yapılandırılmış görüşmeler yapılmıştır. Görüşmelerin %75'i çevrimiçi, kalanı yüz yüze ya da telefon ile gerçekleştirilmiştir.

Veri Analizi

Nicel analiz çalışmalarında üç grup için katılımcı sayısısının (N=57) parametrik test kullanımında yeterli olmaması nedeniyle non-parametrik testler kullanılmıştır. Grup karşılaştırmalarında Kruskal-Wallis H testi, anlamlı fark durumunda Dunn post-hoc testi; gruplar içi değişimler için Wilcoxon Z Signed-rank testi; kategorik veriler için ise Ki-kare testi uygulanmıştır. Etki büyüklüğü için Cohen's d ve Ki-kare testinin kullandığı değişkenlerde Cramer's V hesaplanmıştır. Tüm analizler ODTÜ tarafından lisanlı SPSS 28 ile gerçekleştirilmiştir.

Nitel analizlerde Braun & Clarke'ın (2013) tematik analiz yöntemi kullanılmıştır. Kodlama veriye dayalı ve tümevarımcı olarak Excel üzerinden yapılmıştır. Kodlama süreci dış gözlem, akran kontrolü ile yürütülmüştür.

İç Geçerlilik Tehditleri

Fraenkel et al. (2012)'nin iç geçerlilik tehditleri sınıflandırması temel alınarak, yaş, mekân farklılığı, veri toplayıcı etkisi, test etkisi gibi potansiyel tehditler değerlendirilmiş ve uygun önlemler alınmıştır. Örneğin; tüm testler aynı kişi tarafından ve aynı protokollerle uygulanmıştır. Gözlem süreçleri, dış uzmanlar tarafından izlenmiştir.

Güvenirlik (Trustworthiness)

Bu çalışmada nitel verilerin güvenirliğini sağlamak amacıyla Creswell (2013) tarafından önerilen dört temel ölçüt dikkate alınmıştır. İçerik geçerliği (credibility) kapsamında, yarı yapılandırılmış görüşme formu üç alan uzmanının görüşleri doğrultusunda geliştirilmiş ve revize edilmiştir. Transfer edilebilirlik (transferability) ilkesine uygun olarak, katılımcılar belirli ölçütlere göre sistematik biçimde seçilmiş; fiziksel test sonuçları ve sınıf içi gözlemler dikkate alınarak çeşitlilik sağlanmıştır. Bağımlılık (dependability) ilkesi doğrultusunda, veri toplama ve analiz süreci ayrıntılı şekilde planlanmış, kodlama ve tema oluşturma adımları açık biçimde belgelenmiştir. Son olarak, doğrulanabilirlik (confirmability) için tüm bulgular katılımcı ifadelerine dayandırılmış, yorumlar olabildiğince doğrudan alıntılarla desteklenmiş ve araştırmacı öznel etkisini azaltmak amacıyla dış gözlem ve akran denetimi süreçleri uygulanmıştır.

Araştırmacı Rolü

Araştırmacı hem yoga eğitmeni hem de araştırmacı rolündedir. Bu nedenle hem uygulayıcı hem de gözlemci olarak süreci yürütmüş, öznellikten kaçınmak için standart prosedürler ve dış denetimlerle destek alınmıştır. Araştırmacının yoga eğitimi deneyimi, müdahale programının yapısal tutarlılığını sağlamada avantaj sağlamıştır.

Güçlü ve Sınırlı Yönler

Bu çalışmanın çeşitli güçlü yönleri bulunmaktadır. Öncelikle, müdahaleye katılım oranı oldukça yüksek olmuş ve bırakma oranı düşük kalmıştır (bırakma oranı yüz yüze grup için %9.5, çevrimiçi grup için %5). Yüz yüze ve çevrimiçi grupların her ikisinin de aynı eğitmen tarafından yürütülmesi, eğitim sürecinde içerik ve uygulama tutarlılığını sağlamış; bu durum, sonuçların iç geçerliliğini artırmıştır. Ayrıca, kontrol

grubunun dahil edilmesi, yoga müdahalesinin etkisini karşılaştırmalı olarak değerlendirme olanağı sunmuş ve araştırmanın bilimsel gücünü desteklemiştir. Müdahale sonrasında gerçekleştirilen nitel görüşmeler aracılığıyla elde edilen veriler, katılımcı deneyimlerine dair derinlemesine içgörüler sağlamış ve nicel bulgulara anlamlı katkı sunmuştur.

Bununla birlikte, çalışmanın bazı sınırlılıkları da mevcuttur. Örneklem büyüklüğünün parametrik analizler için yeterli düzeyde olmaması nedeniyle, istatistiksel analizlerde çalışmanın doğasına uygun non-parametrik yöntemler tercih edilmiştir. Ancak iki farklı araştırma sorusuna yönelik analizlerin yapılması ve hem gruplar arası hem de grup içi değişimlerin incelenmesi, örneklem büyüklüğünün sınırlılığını kısmen dengelemiş ve araştırmanın bulgu çeşitliliğini artırmıştır. Bu da çalışmanın sadece tek bir sonuç üzerine odaklanmadığını, çok boyutlu ve kapsamlı bir yaklaşım benimsediğini gösterir. Araştırmacının aynı zamanda yoga eğitmeni olması, potansiyel yanlılık riskini artırabilecek bir durumdur. Ancak bu risk, dış uzman gözlemleri, objektif ölçüm araçları ve şeffaf raporlama süreçleriyle en aza indirilmeye çalışılmıştır.

SONUÇLAR

Veriler hem nicel yöntemlerle (ön test-son test analizleri, grup karşılaştırmaları) hem de nitel yöntemlerle (açık uçlu soru formları, tematik analiz) toplanmış ve karma yöntemsel analiz ile yorumlanmıştır.

Nicel Bulgular

Çalışmada kullanılan fiziksel uygunluk testleri (el kavrama gücü, mekik testi, denge testleri, otur uzan ve omuz esneklik testleri) yoga müdahalesinde farklı sonuçlar çıkartmıştır.

Her iki müdahale grubunda da (yüz yüze ve çevrimiçi) el kavrama gücü ve mekik performansında artış görülmüştür. Çevrimiçi grup; mekik testinde daha yüksek gelişme göstermiştir. Her iki grup için gözler kapalı test koşullarında denge gelişiminde anlamlı sonuçlar elde edilmiştir. Örneğin; yüz yüze grup dominant bacak göz kapalı koşulunda, çevrim içi grup dominant olmayan bacak göz kapalı durumunda

daha fazla ilerleme göstermiştir. Kontrol grubu dominant bacak göz açıkta dengede zaman içinde bozulma sergilemiştir.

Otur uzan testi ve omuz esneklik test sonuçlarına göre her iki grupta da esneklikte artış gözlenmiştir. Yüz yüze grup üst vücut esnekliğinde, çevrimiçi grup alt vücut esnekliğinde daha belirgin gelişme sağlamıştır. Sekiz haftalık süreçte, beklenmedik şekilde üç grubun da vücut kitle indeksi ve yağ oranlarında anlamlı bir artış izlenmiştir.

Katılımcıların sağlık algıları değerlendirildiğinde, müdahale gruplarının kontrol grubuna kıyasla daha olumlu değerlendirmeler yaptığı görülmüştür. Algılanan stres verileri, her iki yoga grubunda da stres düzeyinde anlamlı düşüş olduğunu ortaya koymuştur. Yüz yüze grup bireysel olarak stresde daha fazla azalma göstermiştir.
Yoga Öz-Yeterlilik Ölçeği sonuçlarına göre hem yüz yüze hem çevrimiçi yoga gruplarında öz yeterlilik düzeylerinde anlamlı artış kaydedilmiştir. Grup içi değişimde de zihin alt ölçeği haricinde yüz yüze ve çevrim içi gruplarda olumlu bir değişim gözlenmiştir. Özellikle yüz yüze grupta beden ve nefes alt ölçeklerinde gelişim daha belirgin olmuştur. Zihin alt ölçeğindeki değişim her iki grupta anlamlı, ancak grup etkisinde anlamlı bir gelişme gözlemlenmemiştir.

Bir yıl sonraki takip değerlendirmesinde yüz yüze grup katılımcılarının %70,6'sı yoga uygulamasına devam ettiklerini belirtirken, çevrimiçi grupta bu oran %36,8 olarak kalmıştır. Bu fark, yüz yüze formatın sosyal destek, eğitmen rehberliği ve grup motivasyonu gibi unsurlar nedeniyle daha sürdürülebilir olduğu sonucunu ortaya koymaktadır.

Nitel Bulgular

Nitel veriler, açık uçlu sorular aracılığıyla toplanmış ve tematik analizle değerlendirilmiştir. Dört ana tema altında bulgular raporlanmıştır:
Algılanan Yoga Etkileri: Katılımcılar yoga uygulamasının fiziksel güçlenme, esneklik artışı, daha iyi duruş ve psikolojik rahatlama sağladığını ifade etmişlerdir. Dengeye önemli vurgu yapılmamış olmakla birlikte vücut farkındalığının arttığı

gözlemlenmiştir. Yoga sayesinde stres düzeylerinin azaldığı, içsel denge hissinin arttığı ve öz farkındalıklarının geliştiği belirtilmiştir.

Zorluklar ve Engeller: Fiziksel sınırlılıklar, motivasyon eksikliği, dikkat dağınıklığı, çevresel koşullar (özellikle çevrimiçi ortamda) ve bazı pozlarda zorlanma en sık bildirilen zorluklardır. Özellikle çevrimiçi gruptaki katılımcılar teknik sorunlar, ekran karşısında konsantrasyon kaybı ve yalnızlık hissi gibi problemler yaşamıştır.

Yoga Algısındaki Değişim: Katılımcıların önemli bir kısmı yoga hakkında başlangıçta önyargılı olduklarını belirtmiş; ancak deneyim süreci sonunda yoga algılarının dönüşerek daha bütüncül bir farkındalığa dönüştüğü görülmüştür.

Yöntemsel Geri Bildirimler: Yüz yüze yöntemin grup enerjisi, eğitmenle doğrudan temas ve fiziksel destek açısından daha faydalı bulunduğu; çevrimiçi yöntemin ise zaman ve mekân esnekliği sağladığı ifade edilmiştir.

Karma Yöntem Bulguları

Bulgular, üç ana alanda sentezlenmiştir: fiziksel uygunluk, psikolojik değişkenler ve yoga öz-yeterliği.

Fiziksel Uygunluk

Nicel analizler hem yüz yüze hem de çevrimiçi yoga gruplarında kuvvet ve esneklik ölçümlerinde anlamlı gelişmeler olduğunu göstermiştir. Katılımcılar da kendilerini daha güçlü, esnek ve dayanıklı hissettiklerini belirtmiş; postürlerini daha iyi kontrol ettiklerini ifade etmiştir. Nitel ve nicel bulgular bu alanda yüksek uyum göstermiştir. Buna karşılık, denge testleri bazı test koşullarında (örneğin gözler açık ve kapalı) gruplar arasında farklılık göstermiştir ancak katılımcıların bu gelişmeleri doğrudan ifade etmediği görülmüştür. Vücut kompozisyonunda (yağ oranı ve BMI) tüm gruplarda artış gözlenmiş, bu durum nitel verilerde yansıtılmamıştır. Bu da beden kompozisyonundaki değişimlerin katılımcılar tarafından kısa sürede fark edilmediğini düşündürmektedir.

Psikolojik Değişkenler (Stres ve Algılanan Sağlık)

Stres düzeylerinde özellikle yüz yüze ve çevrimiçi yoga gruplarında anlamlı azalmalar saptanmıştır. Katılımcılar da yoga sonrası daha rahat, sakin ve duygusal olarak dengede hissettiklerini, stresle baş etme becerilerinin geliştiğini belirtmiştir. Bu durum, nitel ve nicel veriler arasında güçlü bir uyumu yansıtmaktadır.

Algılanan sağlık açısından gruplar içinde anlamlı bir zaman etkisi gözlenmemekle birlikte katılımcılar iyi olma haline değinmişlerdir. Katılımcılar daha sağlıklı, enerjik, dinç ve canlı hissettiklerini ifade etmiştir. Bu durum, öznel sağlık algısının kısa süreli değişimlerden etkilenebileceğini; nicel araçların bu değişiklikleri yansıtmakta yetersiz kalabileceğini göstermektedir.

Yoga Öz-Yeterliği (Beden, Nefes, Zihin)

Yoga öz-yeterliği puanlarında her iki deney grubunda da genel bir artış gözlemlenmiştir. Beden ve nefes alt boyutlarında nicel gelişmeler, katılımcıların da hareketlerde kendilerini daha kontrollü, dengeli ve rahat hissetmeleriyle örtüşmüştür. Nefes kontrolü ve farkındalığı belirgindir. Nitel veriler, beden ve nefesle ilgili öz-yeterlik artışlarını açıkça desteklemiştir.

Zihin alt boyutunda ise ölçümler anlamlı değişim gösterse de, katılımcı ifadelerinde bu yönde güçlü bir destek bulunmamıştır. Bu durum, zihinsel farkındalık ve bilişsel dönüşümün daha uzun sürede gelişebileceğini ve kısa süreli müdahale programlarında bu tür değişimlerin fark edilmesinin zor olabileceğini düşündürmektedir.

TARTIŞMA

Çalışmanın bu kısmında “Nicel ve nitel bulgular birlikte değerlendirildiğinde, yoga müdahalesinin genel etkisi nasıl açıklanabilir?” araştırma sorusuna katkıda bulunnamk için nicel ve nitel verler birlikte değerlendirilmektedir.

Kas Kuvveti: El kavrama gücü ve mekik testleri sonucunda üç grup arasında anlamlı fark bulunmamıştır. Ancak, her iki müdahale grubu da kas kuvvetinde anlamlı gelişmeler göstermiştir. Özellikle çevrimiçi grup, karın bölgesi kuvvetinde (mekik testi) daha fazla gelişme sergilemiştir. Bu sonuç, hatha temelli Iyengar yoganın tarzı ve uygulama ortamından bağımsız olarak kas kuvvetini artırmada etkili olduğunu göstermektedir. Ev ortamının rahatlığı, stresin azalması ve katılımcıların daha bireysel çalışma fırsatı bulmaları yada bireysel farklılıklar bu durumu açıklayabilir.

Denge: Tek ayak üzerinde dört farklı koşulda yapılan denge testlerinde, birinci araştırma sorusu bağlamında çevrimiçi grup baskın bacak-açık göz koşulunda control grubununa göre anlamlı gelişme göstermiştir. Grup içi farklılıklarda ise; yüz yüze grup ise baskın bacak-kapalı göz durumunda, çevrim içi grup ise baskın olmayan bacak göz kapalı testinde anlamı gelişme göstermiştir. Ayrıca kontrol grup katılımcıları baskın bacak göz açıkta dengede kötüleşme görülmektedir. Göz kapalı durumlar, proprioseptif farkındalığı öne çıkardığı için, Iyengar yoga'nın bu alandaki katkısı önemli bulunmuştur. Ancak Iyengar tarzı yogada kapalı gözle yapılan denge pozlarının azlığı, Iyengar yoganın restroratif etkisi ile ilişkili programların kurgusu, program süresinin kısalığı ve sağlıklı bireylerden oluşan katılımcı grubunun varlığı; daha gelişmiş denge için daha uzun süreli müdahalelere ihtiyaç duyulduğunu göstermektedir.

Esneklik: Gruplar arasında anlamlı bir fark çıkmazken; grup içi değişimlerde hem alt hem üst vücut esnekliği açısından her iki müdahale grubunda anlamlı gelişmeler kaydedilmiştir. Alt vücut esnekliği çevrimiçi grupta, üst vücut esnekliği ise yüz yüze grupta daha belirgin olmuştur. Bu durum, yüz yüze grupta doğrudan eğitmen düzeltmeleri ve Iyengar yoga'nın destekleyici araçlarının daha etkin kullanılmasına bağlanabilir.Ayrıca gruplar arasındaki demografik ve sosyo-ekonomik durumlara bağlı farklılışmanın da bu farklılığı yarattığı düşünülmektedir.

Vücut Kompozisyonu: Tüm gruplarda vücut ağırlığı ve yağ oranında artış gözlenmiştir. Bu durumun, müdahale süresinin kısa oluşu (8 hafta), yoga sıklığının haftada ikiyle sınırlı kalması ve katılımcıların anketler sonucunda çıkan sağlıklı olmayan beslenme alışkanlıklarının devam etmesiyle ilişkili olduğu düşünülmektedir. Bu bulgu, yoganın vücut kompozisyonunu değiştirebilmesi için uzun süreli, yoğun ve

yaşam tarzı değişikliğiyle desteklenmiş programlara ihtiyaç olduğunu ortaya koymaktadır (Hall et al., 2012; Choudhury et al., 2024).

Algılanan Sağlık: Müdahale gruplarında yer alan katılımcılar, program sonrasında sağlıklarını daha olumlu algılamışlardır. Özellikle çevrimiçi grup katılımcıları bu konuda daha yüksek değerler vermiştir. Ancak gruplar arası değişim anlamlı bulunmamıştır. Bu durum, sağlık algısının sadece kısa süreli bir programla değişmesinin zor olduğunu ve yaş, sosyo-ekonomik durum gibi değişkenlerin bu algıyı etkileyebileceğini göstermektedir.

Algılanan Stres: Her iki yoga grubu da stres düzeylerinde azalma göstermiştir. Çevrimiçi grup grup düzeyinde daha etkili görünse de, yüz yüze grup bireysel düzeyde daha büyük değişim göstermiştir. Bu sonuç, yüz yüze eğitimin sosyal destek, eğitmen geri bildirimi ve grup ortamının katkısı ile öz düzenleme becerilerini daha fazla desteklediğini düşündürmektedir.

Yoga Öz-Yeterliği: Çalışmanın birinci araştırma sorusunda üç alt bileşen ve toplam öz yeterlilikte; her iki grupta anlamlı fark çıkmıştır. Bu fark etki değerlendirmesi bağlamında yüz yüze grupta daha belirgindir. Ikinci araştırma sorusu bağlamında vücut alt bileşeninde yüz yüze grup katılımcıları anlamlı bir değişim göstermiştir. Bu sonuçlar, doğrudan geribildirim, fiziksel düzeltmelerin bireylerin yoga uygulamasına olan güvenini vücut bağlamında artırdığını göstermektedir. Nefes bağlamında ise çevrim içi grup katılımcıları anlamlı bir değişim göstermiştir. Zihin boyutunda ise gelişmeler sınırlı kalmıştır. Sadece gruplar arası farkta zihin alt başlığında anlamlı bir fark görülmektedir. Çevrim içi çalışmaların doğrudan bir rehberliğe ihtiyaç duymaması ve gruplar arasındaki sosyo-ekonomik değişim ve demografik farklılaşmanın bu sonuçlarla anlamlı olduğu düşünülmektedir. Zihinsel farkındalık için daha uzun süreli uygulamalara ihtiyaç olduğunu göstermektedir.

Adherence (Uygulamaya Devam): Müdahaleden bir yıl sonra yapılan takipte, yüz yüze grupta yoga uygulamasına devam oranı %70.6 iken, çevrimiçi grupta bu oran %36.8'dir. Bu fark, yüz yüze eğitimin motivasyonu artırma, bağlılık geliştirme ve sosyal destek sağlama konularında daha etkili olduğunu göstermektedir. Çevrimiçi grupta ise bireysel motivasyonun, çevresel destek eksikliğinin ve hedef belirleme

alışkanlıklarının zayıf olmasının devamlılık üzerinde olumsuz etkisi olduğu görülmüştür. Çevrimiçi uygulamaların sürekliliği artırmak için sosyal bağ kurmaya yönelik stratejiler geliştirilmelidir.

Nitel Veri Sonuçlarının Yorumlanması

Algılanan Yoga Etkileri: Katılımcılar fiziksel gücün, esnekliğin, postürün ve dayanıklılığın arttığını bildirmiştir. Psikolojik düzeyde daha sakin, dengeli ve özgüvenli hissettiklerini ifade etmişlerdir. Ayrıca yoga uygulamasının beden ve duygu farkındalığını artırdığı, nefes farkındalığı kazandırdığı belirtilmiştir.

Zorluklar ve Engeller: Bazı katılımcılar yoga sırasında kas ağrısı, esneklik sorunları ve dikkat dağınıklığı yaşamıştır. İçsel direnç, motivasyon eksikliği ve fiziksel yetersizlik hissi en sık bildirilen zorluklardandır.

Yoga Algısındaki Değişim: Başlangıçta yogaya karşı önyargılı olan bazı katılımcılar, sürecin sonunda yogayı hem zihinsel hem de fiziksel olarak dönüştürücü bulmuşlardır. Özellikle yogayı sadece esneme ya da elitist bir uğraş olarak gören katılımcılar, düzenli pratikle bu algılarını değiştirmiştir.

Programın Uygulama Yönüne Dair Görüşler: Çevrimiçi programın kolaylık sağladığı, ancak teknik sorunlar ve dikkat dağınıklığı yaratabildiği belirtilmiştir. Yüz yüze program ise mekansal zorulklarının yanında, grup desteği, eğitmen rehberliği ve sosyal bağ açısından daha güçlü bulunmuştur.

Karma Verilerin Yorumlanması

İlk olarak, kas kuvveti ve esneklik boyutlarında hem nicel hem de nitel veriler uyumludur. Nicel analizlerde, her iki müdahale grubunda da kol gücü ve mekik testlerinde anlamlı artışlar gözlenmiştir. Nitel verilerde ise katılımcılar sıklıkla yoga pratiğinin kendilerini fiziksel olarak daha güçlü hissettirdiğini, postürlerinin düzeldiğini ve bedenlerinin daha esnek hale geldiğini ifade etmişlerdir.

Denge açısından, gözler kapalı koşullarda (DLEC ve Non-DLEC) hem nicel testler; hatha temelli Iyengar yoga'nın proprioseptif farkındalık üzerindeki olumlu etkilerini göstermektedir. Nitel görüşmelerde doğrudan denge ifadesi sık geçmese de beden farkındalığı denge becerilerinin gelişimine dolaylı kanıt sunmaktadır.

Vücut kompozisyonu verileri, her üç grupta da BMI ve yağ oranının arttığını göstermiştir. Nicel olarak bu beklenmedik sonuç, kısa süreli müdahale süresi ve yaşam tarzı faktörleriyle açıklanmıştır. Nitel veriler ise yoga uygulamasının "bedensel değişim" ve "kas aktivasyonu" sağladığını vurgulamaktadır. Bu durum, subjektif beden algısı ile objektif kompozisyon verilerinin farklılaşabileceğini göstermektedir.

Algılanan stres düzeylerinde hem yüz yüze hem de çevrimiçi grupta azalma gözlenmiş; katılımcılar bu değişimi açıkça ifade etmiştir. Bununla birlikte, bazı katılımcılar bu etkinin geçici olduğunu, sadece seans sırasında veya hemen sonrasında hissedildiğini belirtmişlerdir. Bu bulgular, yoga seanslarının kısa vadede etkili olsa da uzun vadeli psikolojik dönüşüm için daha süreklilik gerektirdiğini göstermektedir.

Algılanan sağlık açısından, çevrimiçi grup daha yüksek sağlık algısı bildirmiş, ancak nicel analizlerde bu değişim gruplar arasında anlamlı fark yaratmamıştır. Bu durum; bazı katılımcıların sağlık algısının mevcutta yüksekliği veya sağlıklarını sorgulamak için yeterli yaşamsal deneyimlerinin olmaması ile ilişkilendirilebilir (Arnett, 2000). Bu durum, yeni çalışmalarda genç yetişkinlerin sağlık farkındalıklaırna ilişkin farklı eğitim modüllerinin eklenebileceğini göstermektedir.

Yoga Öz Yeterliliği Ölçeği (YSES) sonuçları ile nitel veriler karşılaştırıldığında, beden ve nefes alt boyutlarında güçlü paralellikler gözlenmiştir. Katılımcılar, bedenlerini daha iyi kontrol ettiklerini, duruşlarını daha farkında olduklarını ve nefeslerini yönetebildiklerini ifade etmişlerdir. Zihin alt boyutundaki gelişim ise hem nicel hem nitel açıdan sınırlı kalmıştır. Katılımcılar, dikkatlerini toplamakta zorlandıklarını, zihinsel berraklık hissinin kısa sürdüğünü belirtmişlerdir. Bu sonuçlar, yoga uygulamalarının zihinsel dönüşüm için daha uzun süreli ve düzenli yapılması gerektiğini ortaya koymaktadır.

Yogaya devam etme verilerinin entegrasyonu, yoga uygulamasının uzun vadeli devamlılığı üzerinde yüz yüze uygulamaların daha başarılı olduğunu göstermektedir. Nicel analiz bağlamında yapılan anketlerde çevrimiçi grubun özellikle motivasyon, sosyal destek ve uygun ortam eksikliği nedeniyle zorlandığı ifade edilmiştir. Yüz yüze grupta ise eğitmenle doğrudan etkileşim, grup aidiyeti ve sorumluluk duygusu, devamlılığı ihtiyacı çıkmıştır. Ayrıca motivasyon eksikliği tüm gruplarda en sık bildirilen eksiklik (%92,98) olmuş, bu durum öz yeterlilik kazanımının tek başına yeterli olmadığını göstermiştir. Nitel bulgulara göre, çevrimiçi grupta öz güven seviyesi yüksek olsa da çevresel koşullar ve sosyal izolasyon yoga uygulamasına devam etmelerini sınırlamıştır.

U. THESIS PERMISSION FORM / TEZ İZİN FORMU

(Please fill out this form on computer. Double click on the boxes to fill them)

ENSTİTÜ / INSTITUTE

Fen Bilimleri Enstitüsü / Graduate School of Natural and Applied Sciences ☐

Sosyal Bilimler Enstitüsü / Graduate School of Social Sciences ☒

Uygulamalı Matematik Enstitüsü / Graduate School of Applied Mathematics ☐

Enformatik Enstitüsü / Graduate School of Informatics ☐

Deniz Bilimleri Enstitüsü / Graduate School of Marine Sciences ☐

YAZARIN / AUTHOR

Soyadı / Surname : ASLAN
Adı / Name : Özlem
Bölümü / Department : Beden Eğitimi ve Spor / Physical Education and Sports

TEZİN ADI / TITLE OF THE THESIS (**İngilizce** / English):
The Effects of In-Person and Online Hatha-Based Iyengar Yoga Programs on Physical Fitness, Perceived Stress, Perceived Health, and Yoga Self-Efficacy Among Young Healthy Adult Women

TEZİN TÜRÜ / DEGREE: **Yüksek Lisans** / Master ☐ **Doktora** / PhD ☒

1. **Tezin tamamı dünya çapında erişime açılacaktır.** / Release the entire work immediately for access worldwide. ☒
2. **Tez iki yıl süreyle erişime kapalı olacaktır.** / Secure the entire work for patent and/or proprietary purposes for a period of **two years. *** ☐
3. **Tez altı ay süreyle erişime kapalı olacaktır.** / Secure the entire work for period of **six months**. ***** ☐

***** *Enstitü Yönetim Kurulu kararının basılı kopyası tezle birlikte kütüphaneye teslim edilecektir. / A copy of the decision of the Institute Administrative Committee will be delivered to the library together with the printed thesis.*

Yazarın imzası / Signature ..... **Tarih** / Date .....
(Kütüphaneye teslim ettiğiniz tarih. Elle doldurulacaktır.)
(Library submission date. Please fill out by hand.)

Tezin son sayfasıdır. / This is the last page of the thesis/dissertation.