

Study Protocol: A Cross-sectional Comparative Study of Yoga Delivery Modes in India (East) & North America (West)

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ABSTRACT

Objective: This study protocol outlines the process and methodology for a large-scale cross-sectional study aimed at comprehensively comparing yoga practices across culturally diverse global populations. The primary goal is to develop a structured approach for comparing yoga practices across populations, taking into account variations and heterogeneity in yoga practice. This analysis is critical to integrating yoga into complementary healthcare with greater reliability and validity. These Specifically, it compares yoga practices in India (East) and North America (West) using a range of yoga elements and examines how different modes of yoga delivery impact yoga practice. The study aims to enhance the validity and comparability of yoga research by exploring the cultural and demographic diversity.

Methods: The study aims to recruit approximately 2,700 participants, with equal representation from India (1,350) and North America (1,350). Participants will be selected from a population of yoga practitioners, including students, instructors, academics, gurus, therapists, and experts. The study utilizes the 14-item Essential Properties of Yoga Questionnaire (EPYQ) to evaluate four key factors: region (India or North America), sex (male or female), impact of delivery mode (remote or in-person), and participant role (instructor or practitioner).

Expected Outcomes: Following this protocol, we expect the main study to systematically identify, analyze, and compare variations in yoga practices across cultural and demographic groups. The findings will provide valuable insights into cross-cultural differences and divergences in different yoga delivery modes, as well as their impact on yoga intervention, practice, therapy, research, and overall integration into healthcare systems. The study aims to analyze the global diversity of yoga practices, emphasizing the importance of accounting for such heterogeneity in yoga research and avoiding overgeneralization of yoga outcomes.

Conclusion: This study protocol provides a systematic approach to study and compare the diversity of yoga practices globally. It emphasizes the importance of considering regional and demographic diversity in yoga research to improve the delivery and outcomes of yoga interventions in diverse healthcare settings. Data collection is ongoing.

Keywords: Yoga practice; Global healthcare; Remote Yoga; Study protocol; East and West yoga comparison

Introduction

Yoga is a holistic practice encompassing a wide range of elements, including physical postures, breathing techniques, meditation, and ethical principles, all aimed at promoting overall well-being and attaining spiritual goals [1–4]. Derived from the Sanskrit word "Yuj," it signifies union, particularly the union of individual consciousness with the supreme consciousness, Brahman. It embodies the integration of mind,

body, and soul. Central to yoga is the concept of Panchkosha, which seeks to harmonize the five sheaths of human existence, guiding practitioners toward a state of Sat-Chit-Ananda (truth, consciousness, and bliss). The Bhagavad Gita describes yoga as both equanimity and skill in action, positioning it as a path for self-realization and spiritual advancement. Various traditions, including Jainism, and the modern teachings of figures like Sri Aurobindo and Swami Vivekananda echo this perspective. As described in the Yoga Sutras of Patanjali, yoga is the mastery of the mind and senses, defined as the stilling of fluctuations in the mind. These Yoga Sutras provide a framework that includes eight integrated practices (limbs), which are critical for achieving yoga-related goals (Figure 1). This framework offers a way to refine an individual's external and internal aspects, guiding them toward the ultimate merging of personal consciousness with supreme consciousness.

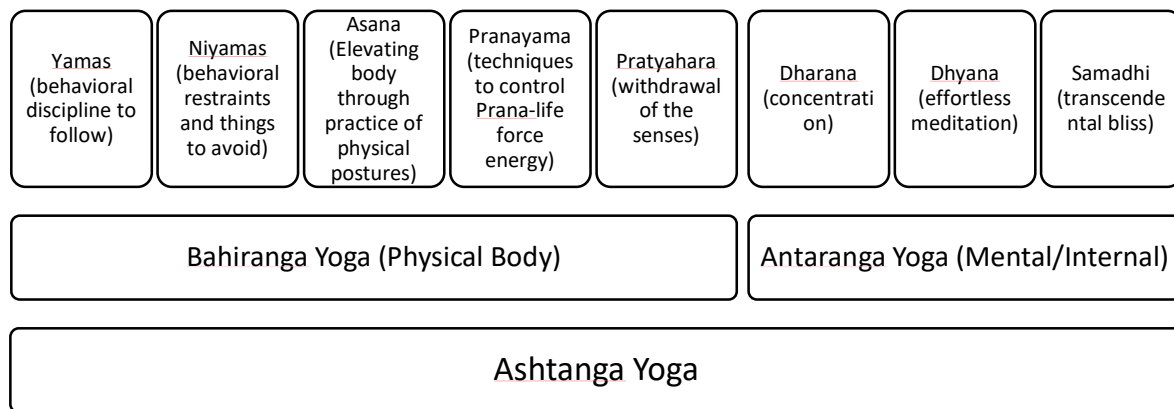


Figure 1. The eight limbs of yoga (Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana, and Samadhi)

Over the centuries, yoga has continuously evolved, adapting to diverse cultural contexts and responding to the changing needs and cultures of practitioners worldwide [1]. In modern healthcare research, yoga is increasingly acknowledged for its role in enhancing overall wellness [5]; improving quality of life [6]; increasing longevity [7]; and aiding in the management of chronic conditions such as chronic pain [8], diabetes [9], cardiovascular diseases [10], and cancer [11]. Furthermore, yoga's positive impact on mental health, particularly in addressing anxiety [12] and depression [13], as well as enhancing immune system function, is gaining recognition [14], establishing it as a valuable complementary practice alongside conventional medical treatment.

However, fully integrating yoga into healthcare and health-related interventions is significantly challenging due to the diversity within yoga, including variations in style, participant demographics, and delivery methods. Yoga comprises multiple components such as yama and niyama (ethical practices), asana (physical postures), pranayama (breathing techniques), and meditation practices (Figure 1). The combination of these components makes it difficult to identify clear cause-and-effect relationships. This aspect challenges the acceptance of most yoga research findings for health interventions. [15]. Furthermore, the lack of standardized procedures for selecting control and comparison groups in yoga studies, unlike the more rigorous designs observed in drug trials with placebo controls, hinders yoga research's robustness. As yoga continues to evolve, particularly with the increasing adoption of digital platforms for delivery [16, 17], addressing these differences is critical for establishing yoga as a credible and effective health intervention.

In recent years, online/remote learning technologies have significantly influenced learning methodologies. The Internet of Things has become deeply embedded in various aspects of education, including academics, sports, training, healthcare, and coaching. The convenience of learning from home has gained prominence, prompting researchers in both academic and non-academic fields to explore and evaluate the efficacy of

remote learning channels. Similar technological developments in yoga learning and practice have sparked debate. The modern a-la-carte yoga methodology, unlike the traditional linear approach to learning, presents many challenges for evaluating and comparing yoga outcomes. It is essential for yoga studies to explicitly identify the delivery modes used, such as traditional in-person instruction, mixed delivery, remote learning, and AI-based technologies. These overlapping and, at times, conflicting delivery methods highlight the need to assess and benchmark the effectiveness of each approach. Evidently, these delivery methods are not equally effective, and their efficacies differ substantially regarding their impact on the body, breath, mind, and consciousness.

Individuals' goals and perceptions vary across countries and cultures, thereby leading to differing intentions and understanding of yoga practice. The gap between yoga knowledge and practice also varies among population segments and across countries. Such knowledge, attitude, and practice (KAP) gaps create distinct barriers and benefits in the respective regions of the world [18]. Further, the online and remote model of yoga delivery offers certain social benefits, albeit with comparative disadvantages. Therefore, the practice, delivery, and effectiveness of yoga may vary across regions worldwide (Figure 2). It is therefore valuable to compare remote delivery methods with in-person instruction, particularly regarding their impact on the body, mind, breath, and spirituality.

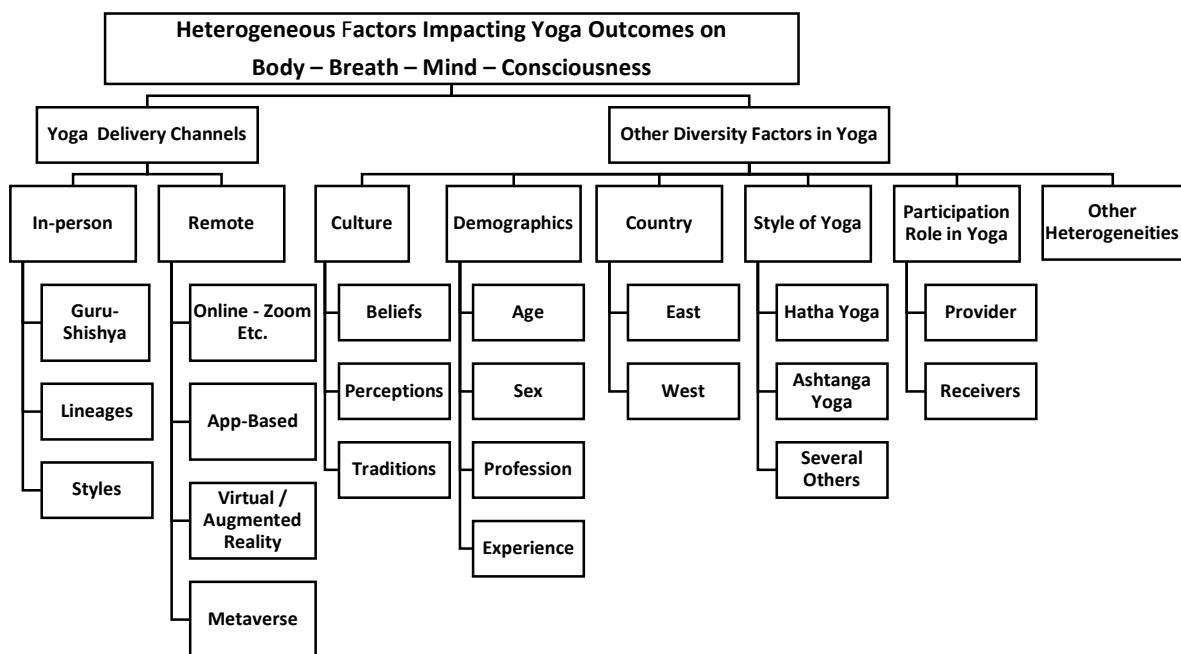


Figure 2. Heterogeneities and divergences to consider in yoga studies

The lack of research on universal measures of delivery efficacy hinders the ability to compare studies, limiting the understanding and reliability of the relative effects of different yoga practice demographics and delivery methods. Previous cross-sectional studies have largely relied on standard health-related instruments and scales that fail to account for the nuances of yoga delivery or facilitate meaningful comparisons across diverse global populations. For example, a cross-sectional survey in Germany examined associations between yoga practices, health status, and health behaviors among yoga practitioners [19]. Another study involved a cross-sectional analysis of health-related quality of life and yoga practice elements in the United States [20]. Furthermore, a national survey of yoga practitioners in the United States was conducted using the PROMIS Global Health Scale [21] to determine the mental and physical health benefits of yoga.

This protocol aims to address these gaps by designing a global cross-sectional study that systematically

compares KAP factors and differences in yoga practice and delivery across two culturally diverse populations: India and North America. The study focuses on the following four key areas:

Regional, sex, and role-based differences: This study analyzes yoga practices among a large and diverse sample of practitioners from India and North America, examining differences based on region, sex, and participant role (instructor vs. practitioner).

Delivery mode comparison: Given the COVID-19 pandemic's rapid shift to remote yoga sessions [22, 23], this study compares the effectiveness of remote versus in-person yoga delivery to understand the implications of this transition [24].

Assessment of participation status: This study evaluates differences between yoga instructors and practitioners regarding their experiences and outcomes.

Demographic analysis: This study compares global practitioners in terms of yoga experience, age, lineage, and style of yoga. After reviewing several other instruments, we chose the Essential Properties of Yoga Questionnaire (EPYQ) to comprehensively capture yoga practice's essential properties with its 14 subscales and robust internal consistency [25]. By focusing on component-level differences, this protocol aims to enhance the global comparability and validation of yoga practices, thereby contributing to their effective integration into modern healthcare. It addresses a critical gap in yoga research by providing a systematic approach to understanding the influence of cultural diversity and delivery modalities. These findings will guide the development of culturally sensitive and effective yoga aimed at enhancing the effectiveness of yoga interventions.

Study protocol
Survey Design This study involves an online survey targeting yoga instructors and practitioners in India and North America, commencing in October 2023. The survey design adheres to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) [25] and the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [26]. We will administer the questionnaire via Google Forms, choosing it for its user-friendly interface and adaptability to diverse participant needs. We will provide detailed instructions and explanations for each question, enabling participants to navigate the survey easily and revise their responses as needed. The ethics committee granted the study ethical approval on June 20, 2022. Before starting the survey, we will ask participants for their informed consent. Each survey will include instructions to ensure participants accurately respond to their yoga experiences. The questionnaire collects demographic information, yoga preferences, practice characteristics, and perceptions of remote and in-person yoga delivery modes. We implement quality control measures, including mandatory qualifying questions, to minimize incomplete submissions and reduce the likelihood of random responses.

Participant Recruitment and Data Collection

A stratified sampling method employs both physical and digital channels to recruit study participants. We focus our recruitment efforts on yoga institutes, studios, and organizations, but we also engage directly through social media platforms like LinkedIn, email, search engines, and phone calls. This approach aims to engage a diverse network of individuals, capturing a broad spectrum of demographics and yoga practices, as well as different experiences of remote and in-person yoga delivery modes. We calculated that the required sample size for each factor segment in the United States would be 185 and 246 for India, respectively. These calculations were based on a 95% confidence level (Z), a 5% margin of error (E), and a 15% prevalence of yoga practice (P). After data cleaning and outlier exclusion, we anticipate a final sample size of approximately 2500 to 3000 participants after data cleaning and the exclusion of outliers.

This study aims for balanced representation, with 1250 to 1,500 participants from each region—India and North America. Amongst other sociodemographic data, this study will also analyze participants' educational backgrounds, particularly the prevalence of formal yoga education, and explore their professional status within the yoga community.

Inclusion and Exclusion Criteria

The inclusion criteria for the participants are as follows: individuals aged 18 years or older, with a minimum of one year of yoga practice experience, and the ability to complete the survey online in English language. We exclude participants from countries other than India and the United States.

Yoga Instrument Selection

We reviewed several yoga property scales used in previous studies to develop and select the most appropriate

questionnaire for this study. These scales identified several key metrics for evaluating various aspects of yoga. However, for this study, we require an instrument that can capture the multi-dimensional components of yoga's properties, which include the mind, body, and consciousness.

After a thorough mapping of the study's objective for a cross-cultural population to the items on different scales, we determined that the EPYQ is a robust instrument. This scale thoroughly addresses all core aspects of yoga practice and its delivery mechanisms, making it a suitable choice for evaluating both online and in-person practice. The study design also took into account the following other scales:

Beliefs About Yoga Scale [27]

Yoga Self-Efficacy Scale [28]

Yoga Instruction Beliefs Scale

Outcome Expectations for Yoga

The Yoga Benefit Scale

Barrier for Yoga Scale

Measures We use the EPYQ [29] to capture and evaluate the yoga properties. We have validated this 62-item instrument as a reliable tool for evaluating the various dimensions of yoga practice [30]. It captures participants' perceptions of yoga across 14 subscales, each representing a critical component of yoga practice: acceptance, compassion, breathwork, physicality, active postures, restorative postures, body locks (bandhas), body awareness, mental/emotional awareness, health benefits, individual attention, social aspects, spirituality, meditation/mindfulness, and yoga philosophy. Participants rate their experiences on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating more effective yoga practice [30]. We calculate the mean scores across the 14 subscales to evaluate the yoga sessions' content and delivery effectiveness. We confirmed the validity and reliability of the instrument through confirmatory factor analysis and reliability testing using a preliminary sample.

Comparison of Yoga Practice Across Four Factors This study compares yoga practices across four key factors: region (India or North America), sex (men or women), delivery mode (remote or in-person), and participation status (instructor or practitioner). The EPYQ provides mean scores across all 14 subscales. This study aims to identify regional differences in total EPYQ scores, with potential variations in delivery mode and participation status. The analysis highlights how different demographic groups engage in yoga, providing insights into the aspects of yoga emphasized within various cultural contexts.

Comparison of Yoga Practice Across 14 Components This study explores the mean differences in 14 EPYQ subscales by region, delivery mode, sex, and participation status. We anticipate that the Indian sample will score higher on subscales related to spirituality and social aspects, while the North American sample will score higher on body awareness, acceptance, and compassion. This study also examines the impact of remote delivery modes on yoga components, such as philosophy and health benefits, compared to in-person delivery. It hypothesizes that remote delivery is more effective for specific components but less so for others, such as individual attention. We also explore sex differences in yoga practice, anticipating that men and women may prioritize different aspects of yoga. We also examine how experience levels of instructors and practitioners influence the emphasis on physical versus meditative practices.

Planned Statistical Analysis Statistical analyses include demographic analyses, descriptive statistics, t-tests, chi-square tests, and multivariate analysis of variance (MANOVA). We will use one-sample t-tests to assess the significance of responses across the EPYQ subscales, with a focus on identifying positive responses. We will employ the chi-square test to assess the internal validity of the data. We will perform a MANOVA to compare the differences in EPYQ scores by region, sex, delivery mode, and participation status. We will also explore the interaction effects between these factors, focusing on identifying significant differences in the health benefits, meditation/mindfulness, and yoga philosophy subscales. This analysis aims to provide a comprehensive understanding of how these factors are associated with yoga practices and perceptions.

Expected implications and future directions We expect the outcomes of this study to improve the validity and comparability of yoga-related scientific research, thereby enhancing the integration of yoga into global healthcare. Findings regarding how different factors (e.g., region and delivery mode) affect yoga practices and outcomes can inform the development of customized yoga interventions that are culturally sensitive and tailored to specific populations. Additionally, the findings on the effectiveness of remote versus in-person yoga delivery can provide guidance on optimizing these modes in different contexts. The study will also explore the broader implications of yoga practices, such as the role of individualized attention and the need for customized yoga programs that consider cultural differences. By focusing on the differences in yoga practices between Eastern and Western populations, this study helps bridge existing gaps in the literature and provides a systematic approach to integrating yoga into modern healthcare.

Conclusion This study protocol outlines a systematic approach to examining the factors that influence yoga practices across delivery modes

and cross-cultural populations. We expect the planned analysis to uncover significant differences based on region, sex, delivery mode, and participation status. This will enhance our comprehension of the effective integration of yoga into healthcare. We expect the findings of this study to facilitate the creation of customized yoga interventions for a diverse global population, thereby enhancing health outcomes. Future research could build on these findings by exploring additional factors, such as age, yoga style, education, and motivation, to further enhance the effectiveness of yoga as a health intervention.

References

- Pandurangi AK, Keshavan MS, Ganapathy V, Gangadhar N: Yoga: past and present. *Am J Psychiatry*. 2017, 174(1):16–7. 10.1176/appi.ajp.2016.16080853
- Büssing A, Michalsen A, Khalsa SBS, Telles S, Sherman KJ: Effects of yoga on mental and physical health: a short summary of reviews. *Evid Based Complement Alternat Med*. 2012, 2012:165410. 10.1155/2012/165410
- Field T: Yoga research review. *Complement Ther Clin Pract*. 2016, 24:145–61. 10.1016/j.ctcp.2016.06.005
- Ross A, Thomas S: The health benefits of yoga and exercise: a review of comparison studies. *J Altern Complement Med*. 2010, 16(1):3–12. 10.1089/acm.2009.0044
- Bhagat, Om Lata: Yogic concepts of holistic health and wellness. *J Adv Res Ayurveda Yoga Unani Sidhha Homeopathy*. 2018, 5(1):15–8. 10.24321/2394.6547.201805
- Woodyard C: Exploring the therapeutic effects of yoga and its ability to increase quality of life. *Int J Yoga*. 2011, 4(2):49. 10.4103/0973-6131.85485
- Tolahunase M, Sagar R, Dada R: Impact of yoga and meditation on cellular aging in apparently healthy individuals: a prospective, open-label single-arm exploratory study. *Oxid Med Cell Longev*. 2017, 2017:7928981. 10.1155/2017/7928981
- Saper RB, Lemaster C, Delitto A, et al.: Yoga, physical therapy, or education for chronic low back pain: a randomized noninferiority trial. *Ann Intern Med*. 2017, 167(2):85–94. 10.7326/M16-2579
- Innes KE, Selfe TK: Yoga for adults with type 2 diabetes: a systematic review of controlled trials. *J Diabetes Res*. 2016, 2016:6979370. 10.1155/2016/6979370
- Cramer H, Lauche R, Haller H, Dobos G, Michalsen A: A systematic review of yoga for heart disease. *Eur J Prev Cardiol*. 2015, 22(3):284–95. 10.1177/2047487314523132
- Hsueh EJ, Loh EW, Lin JJA, Tam KW: Effects of yoga on improving quality of life in patients with breast cancer: a meta-analysis of randomized controlled trials. *Breast Cancer*. 2021, 28(2):264–76. 10.1007/s12282-020-01209-6
- Hofmann SG, Andreoli G, Carpenter JK, Curtiss J: Effect of Hatha yoga on anxiety: a meta-analysis. *J Evid Based Med*. 2016, 9(3):116–24. 10.1111/jebm.12204
- Bridges L, Sharma M: The efficacy of yoga as a form of treatment for depression. *J Evid Based Complement Alternat Med*. 2017, 22(4):1017–28. 10.1177/2156587217715927
- Falkenberg RI, Eising C, Peters ML: Yoga and immune system functioning: a systematic review of randomized controlled trials. *J Behav Med*. 2018, 41(4):467–82. 10.1007/s10865-018-9914-y
- Matko K, Bringmann HC, Sedlmeier P: Effects of different components of yoga: a meta-synthesis. *OBM Integr Complement Med*. 2021, 6(3):1–27. 10.21926/obm.icm.2103030
- Grabara M: Hatha yoga as a form of physical activity in the context of lifestyle disease prevention. *Pol J Sport Tourism*. 2017, 24(2):65–71. 10.1515/pjst-2017-0007
- Shriya S, Dave N: The concept of Bahiranga and Antaranga yoga according to Patanjali Yoga Sutra and Vasishtha Samhita: a comparative study. *Vidya*. 2023, 2(1):148–61. 10.47413/vidya.v2i1.166
- Mishra A, Chawathey SA, Mehra P, et al.: Perceptions of benefits and barriers to yoga practice across rural and urban India: implications for workplace yoga. *Work*. 2020, 65(4):721–32. 10.3233/WOR-203126
- Cramer H, Quinker D, Pilkington K, Mason H, Adams J, Dobos G.: Associations of yoga practice, health status, and health behavior among yoga practitioners in Germany—results of a national cross-sectional survey. *Complement Ther Med*. 2019, 42:19–26. 10.1016/j.ctim.2018.10.026
- Birdee GS, Ayala SG, Wallston KA: Cross-sectional analysis of health-related quality of life and elements of yoga practice. *BMC Complement Altern Med*. 2017, 17(1):83. 10.1186/s12906-017-1599-1
- Ross A, Friedmann E, Bevens M, Thomas S: National survey of yoga practitioners: mental and physical health benefits. *Complement Ther Med*. 2013, 21(4):313–23. 10.1016/j.ctim.2013.04.001
- Brinsley J, Smout M, Davison K: Satisfaction with online versus in-person yoga during COVID-19. *J Altern*

- Complement Med. 2021, 27(10):893–6. 10.1089/acm.2021.0062
- Bushell W, Castle R, Williams MA, et al.: Meditation and yoga practices as potential adjunctive treatment of SARS-CoV-2 infection and COVID-19: a brief overview of key subjects. *J Altern Complement Med.* 2020, 26(7):547–56. 10.1089/acm.2020.0177
- James-Palmer A, Anderson EZ, Daneault JF: Remote delivery of yoga interventions through technology: scoping review. *J Med Internet Res.* 2022, 24(6):e29092. 10.2196/29092
- Eysenbach G: Improving the quality of web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res.* 2004, 6(3). 10.2196/jmir.6.3.e34
- Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP: The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies. *Prev Med.* 2007, 45(4):247–51. 10.1016/j.yp
- Sohl SJ, Schnur JB, Daly L, Suslov K, Montgomery GH, Forest W: Development of the Beliefs About Yoga Scale. *Int J Yoga Therap.* 2012, 21:85–91. 10.17761/ijyt.21.1.016p4306147737q5
- Birdee GS, Sohl SJ, Wallston K: Development and psychometric properties of the Yoga Self-Efficacy Scale (YSES). *BMC Complement Altern Med.* 2015, 16(1):3. 10.1186/s12906-015-0981-0
- Groessler EJ, Maiya M, Elwy AR, et al.: The Essential Properties of Yoga Questionnaire: development and methods. *Int J Yoga Ther.* 2015, 25(1):51–9. 10.17761/1531-2054-25.1.51
- Park CL, Elwy AR, Maiya M, et al.: The Essential Properties of Yoga Questionnaire (EPYQ): psychometric properties. *Int J Yoga Ther.* 2018, 28(1):23–38. 10.17761/2018-00016R2