Health-Related Quality of Life Outcomes With Regular Yoga and Heartfulness Meditation Practice: Results From a Multinational, Cross-sectional Study

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Abstract

Background: Although the benefits of yoga are well established across the world, there are limited studies exploring the long-term interrelation between yoga, meditation, and health. Specifically, there is limited research exploring the differences in health-related quality of life (HRQOL) among regular meditators and nonmeditators.

Objective: This study explored the differences in 7 domains of HRQOL (including quality of life, ability to adopt a healthy lifestyle, ability to relax, frequency of nervousness and stress, coping with day-to-day stress, workplace productivity, and staying healthy during the COVID-19 pandemic) among practitioners of yoga and meditation.

Methods: A cross-sectional, online survey was distributed to all members who participated in a 100-day yoga and meditation program, culminating in the International Day of Yoga event, organized by the Heartfulness Institute in partnership with the Central Council for Research in Yoga and Naturopathy, Ministry of Ayush, SVYASA Yoga University, and Patanjali Yoga Institute, India. The program consisted of daily virtual yoga, meditation, and speaker sessions. The data were analyzed by nonparametric Mann-Whitney U test and Kruskal-Wallis tests for continuous variables and chi-square test for categorical variables.

Results: A total of 3164 participants from 39 countries completed the survey. Mean age was 33.8 (SD 13.6) years. The majority of the participants were female (n=1643, 52%) and students (n=1312, 41.5%). Regular yoga and meditation practice was associated with a positive impact on all 7 domains of HRQOL (Mann-Whitney P<.05 and χ²P<.05). Notably, experienced Heartfulness (≥2 years) meditators reported better outcomes in all the domains of HRQOL as compared to those not currently practicing this form of meditation and participants with ≤1 year of Heartfulness meditation experience (P<.05).

Conclusions: This is one of the first cross-sectional studies to explore HRQOL outcomes among participants of a 100-day virtual yoga and meditation program. Overall, a yoga and meditation practice was found to be an effective tool for promoting HRQOL. Regular yoga and meditation practice was associated with factors promoting health and well-being, with long-term meditation practice associated with increased benefits.

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Introduction

The COVID-19 pandemic is an unprecedented crisis, the effects of which have been felt globally [1-3]. In March 2020, there were 372,757 reported cases from 170 countries, followed by a rapid rise in cases and geographical spread, with over 440 million people affected by COVID-19 globally as of February 2022; during the past 2 years, the pandemic caused disruptions in physical, mental, and emotional health, severely impacting health-related quality of life (HRQOL) [4-6]. HRQOL is an individual’s or a group’s perceived physical and mental health over time [7]. It is an important measure used to assess the impact of diseases or disabilities on the physical, mental, and social domains of population health [8]. A growing body of evidence suggests the current pandemic has had a substantial negative impact on various dimensions of HRQOL, thus highlighting the need to prioritize both mental and physical health dimensions in these challenging times [9-11].

Prior literature has suggested the practice of yoga and meditation can significantly improve an individual’s HRQOL [12-14]. Yoga, a mind-body practice that includes a combination of physical poses, regulated breathing, and meditation, is one of the world’s most popular practices for general well-being [15]. Yoga and meditative practices are an effective intervention for chronic health conditions including diabetes, cardiovascular disease, metabolic syndrome, and cancer [16,17]. Furthermore, the practice is beneficial in decreasing inflammation and improving immune system function, favorably affecting mental health by reducing depression and anxiety [18-24]. Although the benefits of yoga and meditation are well established around the world, there are limited studies exploring the long-term interrelation between yoga, meditation, and health [14]. Specifically, there is limited research exploring the differences in HRQOL among meditators and nonmeditators. The aim of this study was to explore the differences in 7 domains of HRQOL (quality of life, ability to adopt a healthy lifestyle, ability to relax, frequency of nervousness and stress, coping with day-to-day stress, workplace productivity, and staying healthy during the COVID-19 pandemic) among individuals who participated in a 100-day virtual yoga and meditation program, culminating in the International Day of Yoga event.

Methods

Study Design

This is a cross-sectional study that included participants aged ≥18 years from 39 participating countries. The online survey was administered to all participants registered for the International Day of Yoga event, organized by the Heartfulness Institute in partnership with the Central Council for Research in Yoga and Naturopathy (CCRYN), Ministry of Ayush, SVYASA Yoga University, and Patanjali Institute, India. Individuals included in the study (1) were at least 18 years of age, (2) had internet access and the ability to complete an online survey either in English or Hindi, and (3) had registered to participate in a 100-day virtual yoga and meditation program. Participants for the event were recruited by multiple channels including social media, partner organizations, and word of mouth. All participants completing the survey and consenting to the use of data for research purposes were included in the analysis. Ultimately, 3164 participants were included in the analysis.

Intervention

The virtual 100-day yoga and meditation program ran from March 14, 2021, through June 21, 2021. The event was telecasted on YouTube and social media pages including Facebook. The program was facilitated by certified yoga and Heartfulness meditation trainers and consisted of live yoga asanas (postures) in the tradition of Ashtanga yoga, meditation, and speaker sessions. Asana sessions consisted of breathing exercises (pranayama), sun salutation (surya namskar), yoga practice (beginner, intermediate, and advanced levels as the program progressed), and meditation sessions. Meditation sessions were based on Heartfulness practices. Participants were requested to sit comfortably with eyes closed and gently focus their attention on the source of light within their heart. Participants were asked to simply tune into their hearts and be open to any experience they may have as opposed to trying to visualize the light. If their attention drifted, participants were advised to gently redirect their attention toward their heart.

This form of meditation practice has been studied in multiple settings, demonstrating favorable outcomes on burnout, sleep, loneliness, heart rate variability, and emotional well-being [25-33]. Further, speaker sessions included subject matter experts on yoga and meditation from around the world who spoke about topics including but not limited to history of yoga, yoga for unity and well-being, effect of yoga on different systems in the body, benefits of meditation, and research in yoga. The duration of the daily sessions was approximately 1 hour.

Survey Instrument and Data Collection

The survey was designed using standardized scales for well-being–related measures along with questions on demographics and patterns of yoga and Heartfulness meditation practice and administered as a Google Form. The survey was developed in partnership with the CCRYN, Ministry of Ayush, Government of India, to ensure representation of global yoga and meditation practices. Administered in both English and Hindi languages, the survey consisted of 20 items and was divided into three parts: (1) participant demographics including age, gender, country of residence, and occupation, (2) regularity of yoga practice and duration of meditation practices, and (3) HRQOL questions rated on a scale from 0-10 on quality of life, ability to adopt a healthy lifestyle, coping with day-to-day stress, workplace productivity, and staying healthy during the COVID-19 pandemic. Further, a Likert scale was used to assess the domains of ability to relax and frequency of nervousness and stress. Data were collected over a 2-week period.
Ethical Considerations
This study was cross-sectional in nature and was conducted as a program evaluation. As such, it was exempt from institutional review board approval. However, informed consent and password protection for data collection were included. This e-survey design was reported using the CHERRIES (Checklist for Reporting Results of Internet E-Surveys) guidelines [34]. Participation was voluntary and included signing an electronic informed consent form prior to accessing the survey questionnaire.

Cost to Participants
Participants did not incur any costs associated with the event and did not receive any incentives for study participation. All participants received a certificate of participation from the Heartfulness Institute, India, at the end of the program.

Data Analysis
Survey results were cleaned to identify miscoded, missing data and outliers. Data were entered in Microsoft Excel and analyzed using SPSS (version 22; IBM Corp). Descriptive statistics (frequencies, percentages, and standard deviations) were obtained to describe the demographic data, yoga and meditation practice patterns, and attendance across the 100-day virtual yoga event. Participants were asked to report on the frequency of yoga to examine its relation to HRQOL. The differences in HRQOL among participants who practiced yoga regularly was compared against participants who had previously tried this form of meditation but were not currently practicing. Kolmogorov-Smirnov normality test showed that most data were not normally distributed. Thus, Mann-Whitney U test and Kruskal-Wallis tests were used for continuous variables and chi-square test was used for categorical variables. Further, a post hoc analysis of continuous variables was conducted to examine differences in HRQOL within the Heartfulness meditation practitioner group. A P value of <.05 was considered statistically significant throughout the analysis.

Results

Overview
Participants’ demographic characteristics are described in Table 1. Of the 3164 participants included in the analysis, the majority were female (n=1643, 51.93%) and students (n=1312, 41.47%). Participants’ mean age was 33.87 (SD 13.61, range 18-80) years. Of the 39 countries that participated in the program, most of the participation was from India (n=3020, 95.45%), followed by the United States (n=29, 0.92%) and United Arab Emirates (n=17, 0.53%). Of 3164 participants in the sample, 1647 (52.05%) were regular yoga practitioners, and 1517 were categorized as nonregular yoga practitioners (47.95%). Further, 64.89% (n=2053) reported experience with Heartfulness meditation practice and 35.11% (n=1111) did not practice Heartfulness meditation. Among the Heartfulness meditation practitioners, 38.28% (n=786) reported ≤1 year of practice, 59.28% (n=1217) had practiced for ≥2 years, and 2.44% (n=50) of participants reported not currently practicing this form of meditation.
Table 1. Population demographics (N=3164).

| Characteristics                                      | Values                    |
|------------------------------------------------------|---------------------------|
| Gender, n (%)                                        |                           |
| Male                                                 | 1520 (48.04)              |
| Female                                               | 1643 (51.93)              |
| Other                                                | 1 (0.03)                  |
| Age (years), mean (SD)                               |                           |
| Heartfulness meditation group                        | 34.53 (SD 14.46)          |
| Non-Heartfulness meditation group                     | 30.41 (SD 12.27)          |
| Frequency of yoga practice, n (%)                    |                           |
| Regular yoga practitioner                             | 1647 (52.05)              |
| Nonregular yoga practitioner                          | 1517 (47.95)              |
| Meditation group, n (%)                              |                           |
| Heartfulness meditation group                         | 2053 (64.89)              |
| Non-Heartfulness meditation group                     | 1111 (35.11)              |
| Years with Heartfulness meditation group, n (%)       |                           |
| ≤1 year                                              | 786 (38.28)               |
| ≥2 years                                             | 1217 (59.28)              |
| Not currently practicing                              | 50 (2.44)                 |
| Occupation, n (%)                                    |                           |
| Student                                              | 1312 (41.47)              |
| Government and public sector services                | 404 (12.77)               |
| Professionals (engineers, legal, human resources, etc)| 400 (12.64)              |
| Others                                               | 360 (11.38)               |
| Health care professionals                            | 243 (7.68)                |
| Homemaker                                            | 211 (6.67)                |
| Self-employed, entrepreneurs, business               | 206 (6.51)                |
| Farmer                                               | 15 (0.47)                 |
| Armed forces                                          | 13 (0.41)                 |
| Country, n (%)                                       |                           |
| India                                                | 3020 (95.45)              |
| United States                                        | 29 (0.92)                 |
| United Arab Emirates                                 | 17 (0.54)                 |
| Canada                                               | 10 (0.32)                 |
| United Kingdom                                       | 9 (0.28)                  |
| Malaysia, France, Oman                               | 8 (0.25) from each country|
| Ukraine, Mauritius                                    | 5 (0.16) from each country|
| Brazil                                               | 4 (0.13)                  |
| Australia, Germany                                   | 3 (0.09) from each country|
| Austria, China, Indonesia, Iran, Ireland, Italy, Kuwait, Qatar, Uzbekistan | 2 (0.06) from each country|
| Argentina, Bahrain, Belarus, Bhutan, Denmark, Hong Kong, Japan, Kenya, Nepal, Mexico, Panama, Philippines, Portugal, Romania, Russia, Spain, Sri Lanka, Venezuela | 1 (0.03) from each country|
**Program Engagement**

A total of 3164 individuals completed the survey and reported an average participation rate of 71 (SD 32) days. Most participants (n=1684, 53.22%) attended daily yoga and meditation sessions throughout the 100 days.

**Effect of Yoga on HRQOL**

Participants who practiced yoga regularly reported a statistically significantly higher positive impact on all domains of HRQOL as compared to participants who were not regular yoga practitioners, including quality of life ($U=924263.5, P<.001$), ability to adopt healthy lifestyle ($U=915778.500, P<.001$), coping with day-to-day stress ($U=898958.000, P<.001$), improving work productivity ($U=908140.500, P<.001$), and staying healthy during the COVID-19 pandemic ($U=896486.500, P<.001$; Table 2). Further, regular yoga practitioners had a greater ability to relax ($df=3, P<.001$) and experienced lower frequency of nervousness and stress ($df=3, P<.001$) as compared to nonregular yoga practitioners (Table 3).

**Table 2. Effect of yoga on health-related quality of life.**

| Health-related quality of life characteristic | Mann-Whitney $U$ test | Wilcoxon $W$ | $Z$ statistic | $P$ value |
|-----------------------------------------------|-----------------------|--------------|---------------|-----------|
| Quality of life                               | 924263.500            | 2075666.500  | −13.381       | <.001     |
| Adopting healthy lifestyle                    | 915778.500            | 2067181.500  | −13.814       | <.001     |
| Coping with day-to-day stress                 | 898958.000            | 2050361.000  | −14.424       | <.001     |
| Improving workplace productivity              | 908140.500            | 2059543.500  | −14.016       | <.001     |
| Staying healthy during the COVID-19 pandemic   | 896486.500            | 2047889.500  | −15.060       | <.001     |

**Table 3. Effect of yoga on health-related quality of life.**

| Health-related quality of life characteristic and category | Regular yoga practitioners, a n (%) | Nonregular yoga practitioners, b n (%) | $P$ value c |
|-----------------------------------------------------------|------------------------------------|--------------------------------------|-------------|
| Ability to relax                                           |                                    |                                      | <.001       |
| Applies to me very much                                    | 789 (47.91)                        | 478 (31.51)                          |             |
| Applies to me to a considerable degree                     | 391 (23.74)                        | 600 (39.56)                          |             |
| Applies to me to some degree                               | 212 (12.87)                        | 258 (17)                             |             |
| Does not apply to me                                       | 255 (15.48)                        | 181 (11.93)                          |             |
| Frequency of nervousness and stress                        |                                    |                                      | <.001       |
| Applies to me very much                                    | 98 (5.95)                          | 94 (6.19)                            |             |
| Applies to me to a considerable degree                     | 172 (10.44)                        | 212 (13.97)                          |             |
| Applies to me to some degree                               | 650 (39.47)                        | 561 (36.99)                          |             |
| Does not apply to me                                       | 727 (44.14)                        | 650 (42.85)                          |             |

aN=1647.
bN=1517.
cChi-square test $P<.05$, $df=3$.

**Effect of Heartfulness Meditation on HRQOL**

Notably, regular Heartfulness meditation practitioners reported a higher statistically significant impact on all HRQOL domains: quality of life ($U=993578, P<.001$), ability to adopt healthy lifestyle ($U=1012703.500, P<.001$), coping with day-to-day stress ($U=984983, P<.001$), improving work productivity ($U=998981.500, P<.001$), and staying healthy during the COVID-19 pandemic ($U=995166.500, P<.001$; Table 4). Further, the Heartfulness meditation practice group had a greater ability to relax ($df=3, P<.001$) and experienced a lower frequency of nervousness and stress ($df=3, P<.001$) as compared to the non–Heartfulness meditation group (Table 5).
Table 4. Effect of Heartfulness meditation on health-related quality of life.

| Health-related quality of life characteristic | Mann-Whitney U test | Wilcoxon W | Z statistic | P value |
|-----------------------------------------------|---------------------|------------|-------------|---------|
| Quality of life                               | 993578.000          | 1611294.000| -6.329      | <.001   |
| Adopting healthy lifestyle                    | 1012703.500         | 1630419.500| -5.538      | <.001   |
| Coping with day-to-day stress                 | 984983.000          | 1602699.000| -6.700      | <.001   |
| Improving workplace productivity              | 998981.500          | 1616697.500| -6.083      | <.001   |
| Staying healthy during the COVID-19 pandemic   | 995166.500          | 1612882.500| -6.491      | <.001   |

Table 5. Effect of Heartfulness meditation on health-related quality of life.

| Health-related quality of life characteristic and category | Heartfulness meditation group,a n (%) | Non–Heartfulness meditation group,b n (%) | P value |
|------------------------------------------------------------|--------------------------------------|-----------------------------------------|---------|
| Ability to relax                                           |                                      |                                         | <.001   |
| Applies to me very much                                     | 866 (42.18)                          | 401 (36.09)                             |         |
| Applies to me to a considerable degree                      | 572 (27.86)                          | 418 (37.62)                             |         |
| Applies to me to some degree                                | 303 (14.76)                          | 170 (15.31)                             |         |
| Does not apply to me                                       | 312 (15.20)                          | 122 (10.98)                             |         |
| Frequency of nervousness and stress                         |                                      |                                         | <.001   |
| Applies to me very much                                     | 94 (4.58)                            | 69 (6.21)                               |         |
| Applies to me to a considerable degree                      | 195 (9.5)                            | 131 (11.79)                             |         |
| Applies to me to some degree                                | 807 (39.31)                          | 488 (43.93)                             |         |
| Does not apply to me                                       | 957 (46.61)                          | 423 (38.07)                             |         |

aN=2053.
bN=1111.
cChi-square test P<.05, df=3.

**Effect of Years of Heartfulness Meditation Practice on HRQOL**

Participants were categorized in three groups based on their response to the number of years of experience with Heartfulness meditation practice: (1) not currently practicing but had previously tried the form of meditation, (2) ≤1 year, and (3) ≥2 years of meditation practice. A total of 1217 participants (59.28%) reported ≥2 years of Heartfulness meditation experience, 786 (38.28%) reported ≤1 year of Heartfulness meditation experience, and 50 (2.44%) reported having previously tried this form of meditation but not currently practicing it. Significant differences within the groups were observed through a Kruskal-Wallis test. The test indicated that quality of life (H=77.33, P<.001), adopting a healthy lifestyle (H=55.54, P<.001), coping with day-to-day stress (H=61.78, P<.001), improving workplace productivity (H=67.64, P<.001), and staying healthy during the COVID-19 pandemic (H=64.79, P<.001) differed between at least one group within the Heartfulness meditation practice group. Post hoc analysis revealed that there was a higher HRQOL for all domains observed for participants with ≥2 years of meditation practice as compared to the other two groups (P<.001; Table 6).
**Table 6.** Post hoc analysis within the Heartfulness meditation practice group.

| Health-related quality of life domain and comparison between groups with different years of Heartfulness meditation experience | Mean difference (group 1 – group 2) | SE | P value<sup>a</sup> | Confidence interval |
|---|---|---|---|---|
| **Quality of life** | | | | |
| Not currently practicing vs <1 year | -0.38682 | 0.23217 | 0.10 | -0.8421 to 0.0685 |
| Not currently practicing vs ≥2 years | -0.56687 | 0.22970 | 0.01 | -1.0173 to -0.1164 |
| <1 year vs not currently practicing | 0.38682 | 0.23217 | 0.10 | -0.865 to 0.5421 |
| ≤1 year vs ≥2 years | -0.18005 | 0.07284 | 0.01 | -0.329 to -0.0322 |
| ≥2 years vs not currently practicing | 0.56687 | 0.22970 | 0.01 | 0.1164 to 1.0173 |
| ≥2 years vs <1 year | 0.18005 | 0.07284 | 0.01 | 0.0372 to 0.3229 |
| **Adopting healthy lifestyle** | | | | |
| Not currently practicing vs <1 year | -0.40880 | 0.23458 | 0.08 | -0.8688 to 0.0512 |
| Not currently practicing vs ≥2 years | -0.55673 | 0.23208 | 0.02 | -1.0119 to -0.1016 |
| <1 year vs not currently practicing | 0.40880 | 0.23458 | 0.08 | -0.512 to 0.8688 |
| ≤1 year vs ≥2 years | -0.14793 | 0.07360 | 0.04 | -0.2923 to 0.0036 |
| ≥2 years vs not currently practicing | 0.55673 | 0.23208 | 0.02 | 0.1016 to 1.0119 |
| ≥2 years vs <1 year | 0.14793 | 0.07360 | 0.04 | 0.0036 to 0.2923 |
| **Coping with day-to-day stress** | | | | |
| Not currently practicing vs <1 year | -0.44081 | 0.23341 | 0.06 | -0.8986 to 0.0169 |
| Not currently practicing vs ≥2 years | -0.59947 | 0.23092 | 0.09 | -1.0523 to -0.1466 |
| <1 year vs not currently practicing | 0.44081 | 0.23341 | 0.06 | -0.0169 to 0.8986 |
| ≤1 year vs ≥2 years | -0.15866 | 0.07323 | 0.03 | -0.3023 to -0.0150 |
| ≥2 years vs not currently practicing | 0.59947 | 0.23092 | 0.009 | 0.466 to 1.0523 |
| ≥2 years vs <1 year | 0.15866 | 0.07323 | 0.03 | 0.1450 to 0.3023 |
| **Workplace productivity** | | | | |
| Not currently practicing vs <1 year | -0.32921 | 0.23048 | 0.15 | -0.7812 to 0.1228 |
| Not currently practicing vs ≥2 years | -0.60412 | 0.22803 | 0.08 | -1.0513 to -0.1569 |
| <1 year vs not currently practicing | 0.32921 | 0.23048 | 0.15 | -0.1228 to 0.7812 |
| ≤1 year vs ≥2 years | -0.27491 | 0.07231 | 0.001 | -0.4167 to -0.1331 |
| ≥2 years vs not currently practicing | 0.60412 | 0.22803 | 0.008 | 0.1569 to 1.0513 |
| ≥2 years vs <1 year | 0.27491 | 0.07231 | 0.001 | 0.1331 to 0.4167 |
| **Staying healthy during the COVID-19 pandemic** | | | | |
| Not currently practicing vs <1 year | -0.50092 | 0.21232 | 0.02 | -0.9173 to -0.0845 |
| Not currently practicing vs ≥2 years | -0.71803 | 0.21006 | 0.001 | -1.1300 to -0.3061 |
| <1 year vs not currently practicing | 0.50092 | 0.21232 | 0.02 | -0.0845 to 0.9173 |
| ≤1 year vs ≥2 years | -0.21711 | 0.06662 | 0.01 | -0.3478 to -0.0865 |
| ≥2 years vs not currently practicing | 0.71803 | 0.21006 | 0.001 | 0.3061 to 1.1300 |
| ≥2 years vs <1 year | 0.21711 | 0.06662 | 0.001 | 0.0865 to 0.3478 |

<sup>a</sup>Values in italics are statistically significant.
Discussion

Principal Findings

Overall, this study showed that a regular yoga and meditation practice was associated with factors promoting health and well-being, with long-term meditation practice associated with increased benefits. This study is one of the first cross-sectional studies to analyze the effects of a 100-day virtual yoga and meditation program and has 3 key findings. First, the demographic results suggest most practitioners are female and students/educated. Our findings corroborate those of other studies in several countries such as the United Kingdom, United States, and Australia, where yoga and meditation practitioners were mostly female and educated [35-38]. Although those studies reported an average age between 39-41 years, this study, in contrast, had a younger population with an average age of 33.8 years and mostly student participants. These findings concur with recent studies in the Indian setting reporting that students and a younger population make up most participants for yoga events [39,40]. Recent literature has reported an increased interest among young people in India to incorporate yoga as part of their fitness regimen [40]. Nevertheless, we speculate the larger participation from India in this global event, as compared to other countries, is because of the broader presence of the event organizers (Heartfulness Institute, CCRYN, Ministry of Ayush, SVYASA Yoga University, and Patanjali Yoga Institute) in India.

Second, participants were highly engaged throughout the program period, given that 100 days of yoga and meditation is a substantial time commitment. A notable average participation rate of 71 days (SD 32), with 53.22% attending sessions every day for 100 days, suggests that participants were willing to engage in an online activity to enhance their well-being. Limited research exists to compare engagement rates of programs centered around International Yoga Day events with previous literature [39,40].

Third, results examining the effect of yoga demonstrated that regular practice had a statistically significant positive impact on all 7 domains of HRQOL. Similar results have been reported by several studies examining the effect of yoga on mental and physical health [40]. There is overwhelming evidence indicating that the frequency of yoga practice positively predicts its health benefits [35,36,38,41,42]. Another important finding of this study was that meditation had a statistically significant positive impact on all the HRQOL domains (P<.05). Interestingly, participants with ≥2 years of experience reported a higher impact on all domains of HRQOL as compared to participants with ≤1 year of meditation practice. The findings imply that sustained practice may cumulatively increase the benefits for well-being. This contrasts with a recent study that found no association between years of meditation practice and mental well-being [42]. Nevertheless, findings from this study concur with previous literature suggesting a positive correlation between perception of health, well-being, and years of meditation practice [43-45].

Limitations

Although this study provided new evidence about characteristics of yoga and meditation practitioners in a 100-day virtual yoga and meditation program, there were several limitations. The data were cross-sectional in nature; therefore, causality cannot be inferred. A priority for future research includes using longitudinal designs to examine the causal relationship between meditation practice and key outcomes of interest of the study. Moreover, all participants included in the evaluation self-selected to participate in the program. This may have contributed to a potential inclusion bias of those with an interest in yoga and meditation. Further, 100 days of yoga is a substantial time commitment and such a program may have limited active participation from a broader population (eg, full-time employees). Additionally, there was an uneven distribution of members from participating countries and findings of the study may be generalizable only to Heartfulness meditation practitioners.

Conclusion

This is one of the first cross-sectional studies to analyze the effects of a 100-day virtual yoga and meditation program. Overall, a yoga and meditation practice was found to be an effective tool to promote HRQOL. Regular yoga and meditation practice was associated with factors promoting health and well-being, with long-term meditation practice associated with increased benefits.

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Conflicts of Interest

All authors are volunteers of Heartfulness Institute or members of the Central Council for Research in Yoga and Naturopathy, and declare no financial conflicts of interest.

References

1. The Lancet: Latest global disease estimates reveal perfect storm of rising chronic diseases and public health failures fuelling COVID-19 pandemic. Institute for Health Metrics and Evaluation. 2020. URL: https://www.healthdata.org/news-release/lancet-latest-global-disease-estimates-reveal-perfect-storm-rising-chronic-diseases-and [accessed 2022-04-29]
2. Tabish S. COVID-19: An unprecedented crisis that needs an extraordinary response. Arch Community Med Public Health 2020 Apr 25;6(1):053-054. [doi: 10.17352/2455-5479.000075]
3. Statement on the Second Meeting of the International Health Regulations (2005) Emergency Committee Regarding the Outbreak of Novel Coronavirus (2019-nCoV). World Health Organization. 2020. URL: https://tinyurl.com/mt64r736 [accessed 2022-04-29]

4. Coronavirus Disease (COVID-2019) Situation Reports. World Health Organization. URL: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/ [accessed 2022-04-29]

5. WHO Coronavirus (COVID-19) Dashboard. World Health Organization. URL: https://covid19.who.int/ [accessed 2022-04-29]

6. COVID-19 pandemic triggers 25% increase in prevalence of anxiety and depression worldwide. World Health Organization. 2022. URL: https://tinyurl.com/3bkukm5n [accessed 2022-04-29]

7. Health-Related Quality of Life (HRQOL). Centers for Disease Control and Prevention. URL: https://www.cdc.gov/hrqol/index.htm [accessed 2022-04-29]

8. Bakas T, McLennon S, Carpenter J, Buelow JM, Otte JL, Hanna KM, et al. Systematic review of health-related quality of life models. Health Qual Life Outcomes 2012 Nov 16;10:134 [FREE Full text] [doi: 10.1186/1477-7525-10-134] [Medline: 23158687]

9. Kaso A, Agero G, Huriza S, Kaso T, Ewune HA, Hailu A. Evaluation of health-related quality of life of Covid-19 patients: a hospital-based study in South Central Ethiopia. Health Qual Life Outcomes 2021 Dec 20;19(1):268 [FREE Full text] [doi: 10.1186/s12955-021-01900-y] [Medline: 34930294]

10. UN report finds COVID-19 is reversing decades of progress on poverty, healthcare and education. United Nations Department of Economic and Social Affairs. 2020 Jul. URL: https://www.un.org/development/desa/en/news/sustainable/sustainable-development-goals-report-2020.html [accessed 2022-04-28]

11. The Top 10 Global Economic Challenges. The Brookings Institution. URL: https://www.brookings.edu/wp-content/uploads/201607/global_economics_brainard.pdf [accessed 2021-11-27]

12. Levin AB, Hadgkiss EJ, Weiland TJ, March CH, van der Meer DM, Pereira NG, et al. Can meditation influence quality of life, depression, and disease outcome in multiple sclerosis? Findings from a large international web-based study. Behav Neurol 2014;2014:916519 [FREE Full text] [doi: 10.1155/2014/916519] [Medline: 25477709]

13. Manocha R, Black D, Wilson L. Quality of life and functional health status of long-term meditators. Evid Based Complement Alternat Med 2012;2012:350674-350679 [FREE Full text] [doi: 10.1155/2012/350674] [Medline: 22614247]

14. Birdee G, Ayala S, Wallston K. Cross-sectional analysis of health-related quality of life and elements of yoga practice. BMC Complement Altern Med 2017 Jan 31;17(1):83 [FREE Full text] [doi: 10.1186/s12906-017-1599-1] [Medline: 28143469]

15. Salmon P, Lush E, Jablonski M, Sephton SE. Yoga and Mindfulness: Clinical Aspects of an Ancient Mind/Body Practice. Cognitive and Behavioral Practice 2009 Feb;16(1):59-72. [doi: 10.1016/j.cbpra.2008.07.002]

16. Bijlani RL, Yempati R, Yadav R, Ray R, Gupta V, Sharma R, et al. A brief but comprehensive lifestyle education program based on yoga reduces risk factors for cardiovascular disease and diabetes mellitus. J Altern Complement Med 2005 Apr;11(2):267-274 [FREE Full text] [doi: 10.1089/acm.2005.11.267] [Medline: 15865492]

17. Chu P, Gotink R, Yeh G, Goldie S, Hunink M. The effectiveness of yoga in modifying risk factors for cardiovascular disease and metabolic syndrome: A systematic review and meta-analysis of randomized controlled trials. Eur J Prev Cardiol 2016 Feb;23(3):291-307 [FREE Full text] [doi: 10.1177/204748731562741] [Medline: 25510863]

18. Ross A, Friedmann E, Bevans M, Thomas S. National survey of yoga practitioners: mental and physical health benefits. Complement Ther Med 2013 Aug;21(4):313-323 [FREE Full text] [doi: 10.1016/j.ctim.2013.04.001] [Medline: 23876562]

19. Villalba DK, Lindsay EK, Marsland AL, Greco CM, Young S, Brown KW, et al. Mindfulness training and systemic low-grade inflammation in stressed community adults: Evidence from two randomized controlled trials. PLoS One 2019;14(7):e0219120 [FREE Full text] [doi: 10.1371/journal.pone.0219120] [Medline: 31295270]

20. Chen KW, Berger CC, Manheimer E, Forde D, Magidson J, Dachman L, et al. Meditative therapies for reducing anxiety: a systematic review and meta-analysis of randomized controlled trials. Depress Anxiety 2012 Jul;29(7):545-562 [FREE Full text] [doi: 10.1002/da.21964] [Medline: 22700446]

21. Streeter C, Gerbarg P, Saper R, Ciraulo D, Brown R. Effects of yoga on the autonomic nervous system, gamma-aminobutyric-acid, and allostasis in epilepsy, depression, and post-traumatic stress disorder. Med Hypotheses 2012 May;78(5):571-579. [doi: 10.1016/j.mehy.2012.01.021] [Medline: 22365651]

22. Ganzel BL, Morris PA, Wethington E. Allostasis and the human brain: Integrating models of stress from the social and life sciences. Psychol Rev 2010 Jan;117(1):134-174 [FREE Full text] [doi: 10.1037/a0017773] [Medline: 20063966]

23. Mane A. International yoga day: Positive step toward global health. Int J Yoga 2015;8(2):163 [FREE Full text] [doi: 10.4103/0973-6131.154073] [Medline: 26170602]

24. 69th session of the General Assembly. United Nations. URL: https://www.un.org/en/ga/69/ [accessed 2022-04-28]

25. Arya NK, Singh K, Malik A, Mehrotra R. Effect of Heartfulness cleaning and meditation on heart rate variability. Indian Heart J 2018 Dec;70 Suppl 3:S50-S55 [FREE Full text] [doi: 10.1016/j.ihj.2018.05.004] [Medline: 30595318]

26. Thimmapuram J, Pargament R, Sibliss K, Grim R, Risques R, Tooren E. Effect of heartfulness meditation on burnout, emotional wellness, and telomere length in health care professionals. J Community Hosp Intern Med Perspect 2017 Jan 31;7(1):21-27 [FREE Full text] [doi: 10.1080/20096666.2016.1270806] [Medline: 28634520]
27. Thimmapuram J, Pargament R, Bell T, Schurk H, Madhusudhan DK. Heartfulness meditation improves loneliness and sleep in physicians and advance practice providers during COVID-19 pandemic. Hosp Pract (1995) 2021 Aug 17;49(3):194-202. [doi: 10.1080/21548331.2021.1896858] [Medline: 33682592]

28. Thimmapuram J, Yommer D, Tudor L, Bell T, Dumitrescu C, Davis R. Heartfulness meditation improves sleep in chronic insomnia. J Community Hosp Intern Med Perspect 2020 Feb 10;10(1):10-15 [FREE Full text] [doi: 10.1080/20096662.2019.1710948] [Medline: 32128052]

29. Thimmapuram JR, Grirm R, Bell T, Benenson R, Lavallee M, Modi M, et al. Factors Influencing Work-Life Balance in Physicians and Advance Practice Clinicians and the Effect of Heartfulness Meditation Conference on Burnout. Glob Adv Health Med 2019 Jan 15;8:2164956118821056 [FREE Full text] [doi: 10.1177/2164956118821056] [Medline: 30733893]

30. Sankar Sylapan B, Nair AK, Jayanna K, Mallipeddi S, Sathyanarayana S, Kutty BM. Meditation, well-being and cognition in heartfulness meditators - A pilot study. Conscious Cogn 2020 Nov;86:103032. [doi: 10.1016/j.concog.2020.103032] [Medline: 33096504]

31. Desai K, Gupta P, Parikh P, Desai A. Impact of Virtual Heartfulness Meditation Program on Stress, Quality of Sleep, and Psychological Wellbeing during the COVID-19 Pandemic: A Mixed-Method Study. Int J Environ Res Public Health 2021 Oct 22;18(21):11114 [FREE Full text] [doi: 10.3390/ijerph182111114] [Medline: 34769634]

32. Iyer RB, Iyer BN. The Impact of Heartfulness-based Elective on Middle School Students. Am J Health Behav 2019 Jul 01;43(4):812-823. [doi: 10.5993/AJHB.43.4.14] [Medline: 31239023]

33. Iyer L, Iyer RB, Kumar V. A Relaxation App (HeartBot) for Stress and Emotional Well-Being Over a 21-Day Challenge: Randomized Survey Study. J Med Internet Res 2004 Sep 29;6(3):e34 [FREE Full text] [doi: 10.1186/s12906-017-1599-1] [Medline: 28798908]

34. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). J Med Internet Res 2004 Sep 29;6(3):e34 [FREE Full text] [doi: 10.1186/s12906-017-1599-1] [Medline: 15471760]

35. Cartwright T, Mason H, Porter A, Pilkington K. Yoga practice in the UK: a cross-sectional survey of motivation, health benefits and behaviours. BMJ Open 2020 Jan 12;10(1):e031848 [FREE Full text] [doi: 10.1136/bmjopen-2019-031848] [Medline: 31932388]

36. Birdee G, Ayala S, Wallston K. Cross-sectional analysis of health-related quality of life and elements of yoga practice. BMC Complement Altern Med 2017 Jan 31;17(1):83 [FREE Full text] [doi: 10.1038/srep36760]

37. Cramer H, Hall H, Leach M, Frawley J, Zhang Y, Leung B, et al. Prevalence, patterns, and predictors of meditation use among US adults: A nationally representative survey. Sci Rep 2016 Nov 10;6(1):36760 [FREE Full text] [Medline: 27829670]

38. Penman S, Cohen M, Stevens P, Jackson S. Yoga in Australia: Results of a national survey. Int J Yoga 2012 Jul;5(2):92-101 [FREE Full text] [doi: 10.4103/0973-6131.98217] [Medline: 22869991]

39. Number of Yoga Practitioners Soars by Up to 30 Per Cent Across Indian Metros: Survey. Ahmed SK. 2016. URL: https://tinyurl.com/ycksvxt [accessed 2022-04-28]

40. Telles S, Sharma SK, Singh N, Balkrishna A. Characteristics of Yoga Practitioners, Motivators, and Yoga Techniques of Choice: A Cross-sectional Study. Front Public Health 2017;5:184 [FREE Full text] [doi: 10.3389/fpubh.2017.00184] [Medline: 28798908]

41. Ross A, Friedmann E, Bavey M, Thomas S. Frequency of yoga practice predicts health: results of a national survey of yoga practitioners. Evid Based Complement Alternat Med 2012;2012:983258 [FREE Full text] [doi: 10.1155/2012/983258] [Medline: 22927885]

42. Priyanka, Rasamia S. A cross-sectional study of mental wellbeing with practice of yoga and meditation during COVID-19 pandemic. J Family Med Prim Care 2021 Apr;10(4):1576-1581 [FREE Full text] [doi: 10.4103/jfmpc.jfmpc_2367_20] [Medline: 3412394]

43. Sukhsohale ND, Phatak MS. Effect of short-term and long-term Brahmakumaris Raja Yoga meditation on physiological variables. Indian J Physiol Pharmacol 2012;56(4):388-392. [Medline: 23781660]

44. Kral TR, Schuyler BS, Mumford JA, Rosenkranz MA, Lutz A, Davidson RJ. Impact of short- and long-term mindfulness meditation training on amygdala reactivity to emotional stimuli. Neuroimage 2018 Nov 01;181:301-313 [FREE Full text] [doi: 10.1016/j.neuroimage.2018.07.013] [Medline: 29990584]

45. Fabio RA, Towey GE. Long-term meditation: the relationship between cognitive processes, thinking styles and mindfulness. Cogn Process 2018 Feb;19(1):73-85. [doi: 10.1007/s10339-017-0844-3] [Medline: 29110263]

Abbreviations

CCRYN: Central Council for Research in Yoga and Naturopathy
CHERRIES: Checklist for Reporting Results of Internet E-Surveys

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