



Effects of Ayurvedic practices on quality of life of health professionals in Brazil: trends from a quasi experimental study

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ABSTRACT

Integral health encompasses the way individuals live, considering their quality of life. An inadequate lifestyle can harm human health, increasing the risk of developing chronic non-communicable diseases, which represent 71% of the causes of death worldwide and 54.7% in Brazil. The COVID-19 pandemic has led to impacts on quality of life, resulting from lifestyle changes, especially among health professionals. This constitutes an important factor in the health-disease relationship and the core of the healthcare approach embraced by Ayurveda. The present study evaluated the role of daily Ayurvedic practices in improving the quality of life of health professionals working in the Family Health Strategy of SUS in Paty do Alferes/RJ, Brazil. Ayurveda practices based on *Trayopastamba* were introduced to 30 health professionals through lectures and guided activities from July to October 2021, spanning three months. Quality of life was assessed using the WHOQOL-BREF questionnaire before and after the intervention. An improvement in perceived quality of life was observed in the physical, psychological, and environmental domains ($p > 0.05$), while the social domain did not show statistically significant results. The physical domain demonstrated the most substantial score increase (10.95). Conversely, the social domain displayed the smallest rise in scores (5.83). In conclusion, the daily Ayurvedic practices demonstrated the potential to enhance the quality of life in this group, contributing to health promotion in a practical and economically accessible manner.

1. Introduction

When approached from a holistic perspective, health encompasses individuals' lifestyles and takes into account their quality of life. As defined by the World Health Organization (WHO), quality of life refers to "an individual's perception of their position in life within the cultural and value systems they belong to, and in relation to their goals, expectations, standards, and worries" [1].

Quality of life is a multifaceted concept that transcends the boundaries of health. Nevertheless, it constitutes a prominently debated subject within preventive medicine, with one of its key objectives being the enhancement and promotion of individuals' well-being. Health-related quality of life can be understood as the perception held by individuals or groups regarding their physical and mental well-being over the course of time. Thus, it is related to lifestyle, which can be understood as the mirror of the attitudes adopted by individuals, groups and countries [2–5].

Behaviors associated with particular lifestyles can disrupt the physiological rhythm of the body, leading to potential harm to human health. This disruption raises the risk of developing chronic non-communicable diseases (NCDs) such as obesity, diabetes, cardiovascular conditions, depression, cancer, among other ailments [2,6–9]. While individuals possess the autonomy to select their preferred lifestyle, these choices are intricately connected to their social circumstances and the opportunities at their disposal, taking into account the social determinants of health [10–12]. NCDs, often termed as lifestyle diseases, are acknowledged for significantly influencing individuals' quality of life. They account for 71% of global mortality causes and 54.7% in Brazil [9,13–15].

For decades, these diseases have been a challenge to global health-care systems, which are therefore investing in prevention and harm reduction strategies rooted in lifestyle modifications. However, humanity faced an unprecedented health challenge with the advent of the COVID-19 pandemic. This crisis brought about consequences for quality of life, stemming, among other factors, from sudden shifts that led to

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adoption of an inadequate dietary patterns, decreased physical activities, heightened screen usage, and inadequate sleep [16,17]. These factors affected the general populace, having a direct impact on healthcare professionals who dealt with the demands of managing the disease in their daily routines [18–20].

In Brazil, the first COVID-19 case was diagnosed in February 2020 and since then, the country has exceeded 37 million confirmed cases and witnessed over 700,000 deaths attributed to the disease, placing it among the countries most profoundly affected by the global pandemic <https://covid.saude.gov.br/> [21]. During the pandemic's most critical phases, Brazil faced a substantial challenge in mitigating virus transmission due to several factors, such as the lack of effective national coordination, socioeconomic disparities, limited access to accurate information, and the emergence of novel virus variants. Furthermore, the pandemic spotlighted vulnerabilities within the Brazilian Unified Health System (SUS). Shortages in hospital beds and personal protective equipment for healthcare professionals underscored these weaknesses, thereby exacerbating the impact on the quality of life for these professionals [22–24].

Contemporary medical practice is increasingly acknowledging lifestyle as an important factor in the intricate relationship between health and disease [25,26]. Remarkably, this foundational concept has been at the heart of healthcare approaches for millennia by traditional medicines such as Ayurveda, one of the traditional medicines of India. Ayurveda's principles for sustaining robust health revolve around three sub-pillars, known as *Trayopastambha*: *Nidra* (sleep), *Ahara* (food) and *Bramacharya* (good practices in everyday life) [27,28]. Embracing the ethos that prevention constitutes the essence of good health, Ayurvedic classical texts offer comprehensive guidance for the establishment of routines that foster enhanced sleep, practice of physical activities, dietary habits, and stress management [29].

Thus, considering Ayurveda as a lifestyle medicine that has the potential to safeguard and enhance the well-being of healthy individuals while also ameliorating the ailments of the sick [30], this study aimed to evaluate the correlation between the incorporation of Ayurvedic daily practices and the perceived quality of life among healthcare in Paty do Alferes, RJ.

2. Material and methods

2.1. Design

A quasi-experimental study, pre-post design, nonrandomized without a control group. This study compared the perception of Quality of Life before and after the lifestyle intervention based on Ayurvedic medicine.

2.2. Setting and participants

The study was carried out from July 2021 to October 2021, focused on professionals from diverse healthcare areas who constitute the Family Health teams in the municipality of Paty do Alferes/RJ. This region has an approximate inhabitant of 27.942 people, primarily residing in rural areas [31]. The healthcare needs of this populace are attended to by 13 units under the Family Health Strategy program, staffed by a total of 137 health professionals [32].

2.3. Recruitment

The recruitment of professionals was conducted through an active search [33], and the sample was selected using convenience sampling, being included in the study the professionals who had the availability to participate throughout the duration of the research, while those who did not complete the WHOQOL-Bref questionnaire prior to the start of the intervention were excluded.

2.4. Measurements

Sociodemographic information and lifestyle factors (including sleep, diet, exercise, and mental relaxation/stress management) were assessed through a self-administered questionnaire prior to the Ayurveda intervention. Participation in the questionnaire was voluntary. Participants were asked to rate their satisfaction with each of these aspects on a scale of 0–10, where 0 indicated “very dissatisfied” and 10 indicated “very satisfied.” To calculate the lifestyle index for the group, the average values assigned by each participant for the four items were computed. This resulted in a potential total score ranging from 0 to 10, where a higher score reflected a higher level of satisfaction with their lifestyle.

To evaluate the Quality of Life (QoL), participants completed the self-administered WHOQOL-Bref questionnaire, provided by the World Health Organization, translated into Portuguese and validated for use. The WHOQOL-Bref is an abbreviated version of the WHOQOL-100, consisting of 26 questions. Two questions have a broad perspective on overall quality of life, while the remaining 24 questions are grouped into four domains: physical (07 questions), psychological (06 questions), social (03 questions), and environmental (08 questions). Responses for each domain are rated on a scale of 0–100 in a positive direction where in a higher score reflects a heightened perception of quality of life. The questionnaire was administered both at the study's outset (Before Intervention, BI) and upon completion of the intervention (After Intervention, AI). Data underwent cleaning, checking, scoring computation, and transformation in accordance with the instructions provided in the WHOQOL-Bref guidelines [1].

2.5. The intervention programme

A lifestyle intervention based on Ayurvedic medicine principles was conducted, drawing from the concept of *Trayopastambha* [27,34].

Over the course of three month, participants engaged in bi-weekly, face-to-face sessions, with groups organized separately at each of the seven healthcare units where healthcare professionals were stationed. These sessions focused on the theoretical and practical aspects of *ahara*, *nidra*, *vyayama*, and mind relaxation as described in the classic Ayurvedic texts [34] and were presented and focused on health promotion. Additionally, supplementary resources, available in audio, video, and text formats [35], were thoughtfully designed and provided to facilitate the integration of lifestyle recommendations into participants' daily routines at home, enhancing adherence to the intervention program. In total, this intervention spanned 20 h, distributed across six sessions.

The first session introduced fundamental concepts of Ayurveda to help participants understand how daily practices could enhance their quality of life (Fig. 1). The following four sessions focused on the four core themes: *Ahara*, *Nidra*, *Vyayama*, and Mind Relaxation. Each of these sessions followed a structured format:

- (1) Anchor: At the beginning of each session, an anchor activity, such as meditation, was used to help participants connect with the present moment. This was especially important since the sessions took place in their workplace, making it challenging to detach from work-related matters;
- (2) Discussion: This segment focused on the topic at hand, using Ayurvedic concepts and linking them to contemporary medical practices, while also encouraging group discussions that allowed participants to share their experiential insights;
- (3) Challenge: Concluding each in-person session, participants received practical suggestions and activities to help them incorporate Ayurvedic concepts into their daily routines.

The final session aimed to reinforce the previously discussed strategies, highlighting the interconnected nature of these topics. While the sessions initially addressed each topic separately for pedagogical reasons, in daily practice, they naturally merge and interact with one

Sessions	Introduction of Ayurveda			
	(1) Ayurvedic perspectives on health (2) Imbalance in the body as a disease-causing factor (3) The importance of routines that respect individuality (4) Strategies for maintaining bodily equilibrium			
	1	Sleep	Body Movement	Mind Relaxation
		Step 01 - Anchor	Step 01 - Anchor	Step 01 - Anchor
		Step 2 - Discussion	Step 2 - Discussion	Step 2 - Discussion
		Step 3 - Challenge	Step 3 - Challenge	Step 3 - Challenge
2	Meditation (1) Importance of sleep (2) Circadian rhythm (3) Sleep and metabolism (4) Impact of diet on sleep quality	Relaxing body movements (1) Benefits of daily exercise (2) Physical capacity (3) Exercise and metabolism (4) When and how to exercise	Meditation (1) Importance of mental relaxation (2) Self-observation in health (3) Mind-body connection (4) Self-responsibility	Meditation (1) Healthy eating (2) Hunger as a physiological need (3) Digestive capacity (4) Quantity and quality of food
3	(1) Disconnecting activities (2) Dietary care (3) Sleep preparation	(1) Daily exercise practice (2) Achieving half of the capacity (3) Trying out new ways to move	(1) Meditation techniques (2) Mindful body movement (3) Therapeutic writing	(1) Respect digestive capacity (2) Improving food choices (3) Critical evaluation of food choices
4	Consolidation			
5	(1) Discussion of the knowledge obtained (2) How to adopt a healthy lifestyle in practice (3) Strategies for scaling in public health			
6				

Fig. 1. Description of intervention programme.

another. This approach was designed to mirror real-life situations, where these elements naturally intertwine.

2.6. Data analysis

The data collected from the WHOQOL-Bref questionnaire were organized and formatted within Excel software [36]. Following this, the data underwent analysis utilizing the SPSS® statistical program. This analysis encompassed absolute distribution, as well as measures of central tendency and variability. To evaluate changes across the two time points, a parametric t-Student test was employed with a significance level set at 5%.

2.7. Ethical considerations

The study received approval from the Ethics and Research Committee (CEP) of the Clementino Fraga Filho University Hospital (HUCFF) at the Federal University of Rio de Janeiro (UFRJ) (CAAE n° 440943320.5.0000.5257). Prior to their involvement, all participants provided their consent by signing the Free and Informed Consent Form, aligning with the established guidelines for data collection [37].

3. Results

Out of the initial 38 participants who expressed their intent to participate in the intervention, 6 were subsequently excluded due to not meeting the inclusion criteria, leaving a total of 32 individuals eligible to partake as research participants. Among them, 2 participants gave up, leaving 30 who remained engaged until the intervention’s conclusion. This final count represented 22% of the overall number of professionals working within the FHS, and 54% (7 units) of the Basic Health Units of the Municipality. It is noteworthy that none of the participants had any prior exposure to Ayurveda.

The sample comprised 29 female and 1 male participants, with an average age of 40 years. These participants held various roles within the healthcare domain, including: Community Health Agent (57% - 17 individuals), Nurse (20% - 06 individuals), Nursing Technician (13% - 04 individuals), Oral Health Assistant (7% - 02 individuals), and Physician (3% - 01 individual).

Out of the 30 participants, 24 provided responses regarding lifestyle factors. Among these, 29% (07 individuals) reported having at least one pre-existing medical condition. Among those with pre-existing conditions, 71% (05 individuals) were managing arterial hypertension and were on continuous medication for this purpose. Other mentioned health conditions included Asthmatic Bronchitis, Hashi Graves, Vitiligo, Intestinal Disorder, Hypothyroidism, and Osteoporosis.

Regarding personal perceptions about their own health, participants were specifically inquired about several aspects, including Sleep, Food, Body Movement, and Mental Relaxation/Stress Management. Analyzing self-assessment of satisfaction in each of these categories, the lowest level of satisfaction was observed in stress management (4.5 ± 1.8), whereas the highest level of satisfaction was noted in the realm of diet (6.9 ± 1.5).

When it comes to their capacity to manage stress on daily basis, a topic of significant dissatisfaction among the group, 96% (23 individuals) reported not have any practices aimed at mental relaxation into their routine. Additionally, 86% (21 individuals) did not engage in self-observation practices, and 33% (08 individuals) revealed challenges in maintaining moments of silence.

In terms of body movement (5.5 ± 2.1), 79% (19 individuals) acknowledged being sedentary, 67% (14 individuals) experienced physical discomfort hindering their engagement in daily activities. Moreover, 42% (10 individuals) spent 4–8 h of their day sitting. Interestingly, 67% (16 individuals) expressed a fondness for physical activity.

In relation to sleep (6.8 ± 1.5), 79% (19 individuals) reported sleeping between 6 and 8 h each day without facing difficulties waking up. However, only 17% (04 individuals) woke up feeling well-rested. Regarding the challenge of initiating sleep, 50% (12 individuals) reported encountering difficulties, while 46% (11 individuals) admitted to using electronic devices before sleep, and 4% (01 individual) relied on sleep-inducing medications.

In terms of food, the aspect that garnered the highest satisfaction within the group, 88% (21 individuals) reported consuming 3 to 4 meals daily. Additionally, 67% (14 individuals) did not adhere to a fixed eating schedule, and 54% (13 individuals) relied on hunger cues to dictate mealtimes. Furthermore, 62% (15 individuals) divided their meals between ultra-processed and minimally processed/natural foods. Notably, 54% (13 individuals) did not experience daily bowel movements, and 42% (10 individuals) felt sluggish after consuming large meals. A significant 79% (19 individuals) expressed a desire to modify their eating habits.

The perception of QoL data collected using the WHOQOL-Bref questionnaire prior to the initiation of the intervention (BI) indicates that the professionals exhibited lower scores in the physical (61.07 ± 18.26) and environment (57.09 ± 13.75) domains. Conversely, they presented higher scores in the social (68.33 ± 18.87) and psychological (61.25 ± 17.23) domains. Upon evaluating QoL after the intervention (AI), lower scores were observed in the environment (64.27 ± 10.43) and psychological (69.72 ± 11.57) domains. In contrast, higher scores were recorded in the physical (72.02 ± 13.39) and social (74.17 ± 13.37) domains.

Across all domains assessed, there was a noticeable improvement

when comparing the before intervention and after intervention results. The Physical domain exhibited the most substantial increase (10.95), trailed by the Psychological domain (8.47), Environment domain (7.19), and Social domain (5.83). It's important to note that while all domains demonstrated an enhancement, the Social domain exhibited the smallest difference and was the sole domain without statistically significant values (Table 1).

Each domain addressed in the questionnaire is stratified by facets, and the analysis of the results shows that there are score comparisons between BI and AI (Table 2). The 'sleep and rest' facet, which belongs to the physical domain, exhibited the greatest difference among all facets, regardless of the domain (20.00 points). On the other hand, 'personal relationships,' which belongs to the social domain, showed the smallest difference before and after the intervention (2.50 points).

Within the physical domain, the 'activities of daily life' facet displayed the second largest difference between BI and AI (14.17), the same value obtained for the 'reduction of negative feelings' facet in the psychological domain. The least affected facets in these domains were 'mobility' and 'body image and appearance,' both with 5.00 points.

In the Environment domain, we observed that the 'healthcare' facet, directly related to the content addressed in the intervention, experienced an increase of 8.33 points between BI and AI.

4. Discussion

This study is the first to evaluate the impact of daily Ayurvedic practices related to *Trayupastambha* on the perceived quality of life of public health professionals in Brazil. Ayurveda, as an integrative and complementary practice that offers a comprehensive approach to care, requires acceptance from health professionals when applied within the realm of health promotion. This is because Ayurveda bridges individual concerns with the social determinants affecting individuals. The results presented here demonstrate that the proposed intervention, grounded in a lifestyle of daily Ayurvedic practices, led to an improvement in the perceived quality of life among health professionals.

The results suggest that undergoing the Ayurveda intervention can have a positive impact on individual quality of life, potentially sensitizing health professionals to extend this practice to all users of the Brazilian Unified Health System (SUS). Through this exposure, professionals can develop wisdom and acquire pedagogical potential that will facilitate health promotion in the future [38]. Understanding the needs of individuals and the population served by SUS is fundamental for improving access to healthcare and promoting the inclusion and development of Integrative and Complementary Practices (ICPs) in the health system [39].

The offer of Ayurveda practices in Brazilian public health is foreseen by the National Policy of Integrative and Complementary Practices [40], a public policy created in 2006 and which gives guidelines for the implementation of 29 integrative and complementary practices in the public health network of Brazil [30]. However, until mid-2019, the number of Ayurveda consultations in the SUS did not reach one thousand per year, which is equivalent to less than 10% of the total acupuncture care in the same period [41].

The substantial participant retention rate throughout the

Table 1
Statistical analysis of WHOQOL-Bref domains before (BI) and after (AI) Ayurveda experience.

	BI	AI	p value
	Mean ± SD	Mean ± SD	
QoL Score (Environment)	57.08 ± 13.75	64.27 ± 10.43	0.029
QoL Score (Social)	68.33 ± 18.87	74.16 ± 13.37	0.129
QoL Score (Psychological)	61.25 ± 17.23	69.72 ± 11.57	0.033
QoL Score (Physical)	61.07 ± 18.26	72.02 ± 13.39	0.014

t-student test: $p \leq 0.05$ (Statistically significant) | SD: Standard Deviation.

Table 2
Score values by facet, before (BI) and after (AI) of the Experience with Ayurveda.

	BI	AI
Physical Domain		
Activities of daily living	53.33	67.50
(-) dependence on medicines and medical aids	68.33	80.00
Energy and fatigue	50.83	58.17
Mobility	75.83	80.83
Pain and discomfort	70.00	75.83
Sleep and rest	50.00	70.00
Work Capacity	59.17	70.83
Psychological Domain		
Bodily image and appearance	66.67	71.67
(-) Negative feelings	60.83	75.00
Positive feelings	50.00	56.67
Self-esteem	62.50	70.00
Spirituality / Religion / Personal beliefs	75.00	85.50
Thinking, learning, memory and concentration	52.50	62.50
Social Domain		
Personal relationships	65.00	75.00
Social support	70.00	72.50
Sexual activity	70.00	75.00
Environment Domain		
Financial resources	43.67	55.00
Freedom, physical safety and security	55.83	65.00
Healthcare	61.67	70.00
Home environment	60.83	69.17
Opportunities for acquiring new information and skills	59.17	68.33
Recreation / leisure activities	42.50	45.83
Physical environment	60.83	68.33
Transport	69.17	72.50

intervention (30 out of 32) indicates strong adherence and engagement among the participants. This observation suggests the feasibility and favorable reception of the proposed activities, even within a group where all individuals were in their workplaces during the intervention. This result could potentially be linked to the predominance of females in the intervention, as they often exhibit a higher level of involvement in self-care regarding health matters [41,42].

The NCDs reported by the participants are common among patients accessing primary healthcare. This condition is capable of negatively influencing the perceived quality of life of its sufferers, especially in the physical domain [43–45].

Based on the outcomes revealed by the WHOQOL-Bref questionnaire, there was a noticeable elevation in scores across all domains. This signifies an enhanced perception of QoL among professionals in all assessed aspects. Notably, the physical domain demonstrated the most substantial score increase. Conversely, the social domain displayed the smallest rise in scores, and it was the sole domain with a statistically insignificant value.

The prominence observed within the physical domain could potentially be linked to the inclusion of facets that the *Trayopastambha* directly addresses and are comprehensively discussed in the "Experience with Ayurveda." Specifically, these facets encompass sleep/rest and energy/fatigue. This correlation suggests that the approach taken with participating professionals and their practical engagement in everyday life exerted a positive influence on enhancing the overall perception of quality of life.

Notably, the facet associated with sleep/rest exhibited the most substantial increase in scores (20 points). This augmentation could potentially be connected to the timing of the intervention amid the COVID-19 pandemic, which brought about a multitude of physical and mental health challenges for healthcare professionals, particularly in terms of sleep disturbances [46,47]. During the pandemic, healthcare workers encountered high-stress conditions, heightened workloads, and emotional exhaustion [46,48–50]. The study's results imply that

participation in the intervention created room for self-care, underscored by the facet of healthcare within the Environment domain, which registered an increase of 8.33 points.

The sedentary lifestyle acknowledged by 79% of participants holds the potential to exert an adverse impact on the perception of quality of life in relation to health [51,52]. Moreover, the Ayurvedic emphasis on *vyayama* (exercise) might have played a role in fostering an enhancement in the participants' perception of quality of life within the physical domain.

For didactic purposes, the intervention proposed in the study distinctly addressed the themes of Sleep, Food, Stress Management, and Body Movement. However, it was emphasized to participants that these aspects are interconnected and mutually influential in their day-to-day lives. Notably, the sedentary lifestyle could potentially influence sleep disorders, where low sleep quality is associated with factors such as mobility, pain/discomfort, anxiety, and depression. Short-term sleep deprivation could lead to elevated stress levels, emotional distress, and a diminished perception of quality of life [47,51,53].

Quality of life encompasses both objective and subjective dimensions, representing an individual's perception of their own life. Despite the Ayurvedic intervention's primary focus on individual health promotion, it transpired as a collective endeavor, nurturing the development of a support network among participants. This communal engagement aligns with the findings of Habimorad and colleagues, highlighting how it fosters socialization and a sense of solidarity [54].

5. Conclusions

The study's findings highlight a positive correlation between adopting the daily practices outlined by Ayurveda and an improvement in individuals' perceived quality of life. The intervention method used was accessible and showed good adherence, making it feasible for healthcare settings without needing extra resources. This suggests potential for wider application in different locations to promote health-awareness. Integrating Ayurvedic concepts into clinical practice could enhance health promotion efforts. While our study stands as the inaugural assessment of the influence of daily Ayurvedic practices on the perceived quality of life among SUS health professionals in Brazil. However, due to the small sample size, the study's results lack generalizability, and it's unclear if the intervention duration allowed for significant lifestyle changes. Expanding the study to other groups is crucial for a deeper understanding of the impact of Ayurvedic practices on quality of life.

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Conflicts of interesting

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Author contributions in the main manuscript

B.E.N: Conceptualization; Methodology; Formal analysis; Investigation; Data curation; Writing – original draft - N.C.B.S: Conceptualization; Methodology; Investigation; Resources; Writing – review and editing; Visualization; Supervision; Project administration.

Declaration on use of generative AI in scientific writing

None.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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