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Body composition and psychophysical well-being of women practicing yoga

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Abstract

Introduction: This study characterized yoga as a form of free-time physical activity by analyzing and evaluating the body composition of women who regularly practice yoga, and by describing the effect of yoga on their psychophysical health. Material and Methods: The study involved 94 women: 56 yoga practitioners and 38 Zumba participants. The subjects were surveyed with a questionnaire to elicit information about their socioeconomic status. Body composition was determined by bioelectrical impedance analysis. Differences were assessed with two-tailed chi-square tests and Student's t-tests. Results: The vast majority of the participants (89%) felt a positive influence of yoga on their mental well-being; 86% noticed an improvement in physical health. More than half of the subjects adhered to a diet; those who practiced yoga chose vegetarian (29%) and vegan (13%) diets more often than those who did Zumba. Yoga participants had a higher BMI than Zumba participants (24.19 vs. 23.43), but they had a lower percentage of fat (28.84% vs. 29.89%) and higher fat free mass (47.08 kg vs. 44.13 kg). Conclusions: Yoga practice positively affects the psychophysical well-being of women. Despite their higher BMI, yoga practitioners had a slightly more favorable body composition, which may indicate that yoga positively affects individual body components and body shape.

Keywords

yoga, physical activity, body composition, psychophysical health

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Article

Body composition and psychophysical well-being of women practicing yoga

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1. Introduction

Yoga is a 3000-year-old discipline developed in India for examining human nature and calming the mind [1]. In Sanskrit, the word "yoga" means unification—body to mind and universe [2]. The way to achieve harmony of the body, mind and spirit [3] leads through breathing practices, physical exercise, concentration and liberation of thought. However, yoga is not only a schematic performance of specific exercises (asanas), but an entire educational, hygienic and therapeutic system. This includes the philosophy of yoga, breathing exercises that are important for the correct performance of asanas, as well as relaxation and hygienic recommendations. The yoga system assumes that all elements permeate and flow out of each other [4].

Nowadays, yoga has become a popular form of physical activity. Historically, it has been practiced in centers specializing only in yoga. At present, it is possible to practice it in, for example, fitness clubs which offer varieties of yoga adapted to the clients' needs (e.g., yoga for pregnant women, breast-cancer survivors, elderly people, office workers). A comparison of traditional and modern yoga shows how much body perception has

changed over the centuries [5]. The "modern" forms of yoga are different from its original concept and are frequently considered only a physical activity for taking care of the body and mental well-being. The poor physical condition of contemporary people forces them to seek forms of movement that will improve their psychophysical well-being. Yoga answers their needs, as it positively affects not only the body but also the mind [6, 7, 2]. As a method of therapy (chikitsa yoga), it has become extremely popular, and numerous studies and systematic reviews provide scientific evidence of its potential to treat many psychosomatic diseases. Today, most people come to it in an attempt to address their physical, mental and emotional imbalance. Yoga provides good results, e.g., in support of addiction therapy [8] and depression treatment [9], and it relieves stress, which has become a permanent feature of human life.

There are also studies suggesting that yoga contributes to a reduction in anthropometric measurements and indicators, such as body weight, waist circumference, hip circumference and BMI [10]. For research purposes, it was interesting to obtain information on the body composition of women practicing yoga and to compare it with that of women who participate in other types of physical activities (control group). For this purpose, Zumba was chosen, which is a new kind of dance training, inspired by Latin American music and Latin dances. It is a combination of elements of aerobic interval training and strengthening exercises, which helps to burn calories, improves the cardiovascular system and strengthens the whole body [11]. This form of physical activity is very different from yoga, and since its appearance in Poland (around 2009), it has been continually gaining in popularity [12].

Therefore, the aims of this study were to characterize yoga as a form of leisure physical activity and to describe the effect of yoga on psychophysical health. To this end, the body composition of women who regularly practice yoga was assessed and compared with that of women who do not practice yoga, but do another form of physical activity (Zumba).

2. Materials and Methods

The study involved 94 women: 56 practitioners of yoga and 38 of Zumba. All subjects had participated in yoga or Zumba for at least one year. The participants were surveyed with the use of a questionnaire to elicit information about their socioeconomic status. Yoga practitioners also responded to questions about their motivation for starting yoga exercises and yoga's effect on health and well-being. The respondents' body composition was determined by bioelectrical impedance analysis (BIA) using an InBody 270 Analyzer. Differences were assessed with two-tailed chi-square tests and Student's t-test. A participant experiment was also used in the research: observations of the yoga practitioners were conducted for a year by one of the authors, who actively participated in the yoga classes.

All the participants in these studies were residents of Olsztyn (172,000 inhabitants). The respondents' average age was 38.97 years, but the yoga practitioners were significantly older than those practicing Zumba ($p < 0.001$). The average age of the yoga participants was 43.88, and that of the Zumba participants was 31.74. Among the yoga practitioners, the most numerous group (57%) comprised individuals aged 41–55 years, and among the Zumba practitioners, 21–30-year-olds (42%). In both groups, most of the subjects had completed higher education (Yoga 82% vs. Zumba 63%). The majority (75%) performed white-collar work (Yoga 84% vs. Zumba 63%), whereas 12% performed blue-collar work (Yoga 12% vs. Zumba 11%). There were significantly more university students in the Zumba group (Yoga 4% vs. Zumba 26%) ($p = 0.005$). Most of the respondents (62%) described their financial situation as good.

3. Results

The most common motive for starting to practice yoga was the need to calm down. More than half of the respondents felt negative emotions before starting a yoga session: stress, fatigue, or nervousness; other respondents felt joy or calm. After the practice, the

respondents' mood improved, as 93% of them reported positive emotions: peace and joy. Most of the respondents noticed changes in their bodies as a result of regular yoga practice. One-third of the respondents noted an improvement in flexibility; other respondents reported improved motor coordination, physical condition, body appearance and quality of sleep; and several noticed reduced spinal pains. The vast majority of participants noticed positive effects of yoga practice on their mental well-being. This manifested itself in general relaxation, calmer emotions and better control over emotions.

Table 1. Yoga practice and the respondents' psychophysical well-being.

	N = 56	%
Motives for starting yoga		
Need to calm down	29	44
Body care / weight loss	16	24
Improve health and well-being	21	32
Feelings before a yoga session		
Stressed	9	11
Tired	29	34
Nervous	7	9
Calm	14	17
Joyful	24	29
Feelings after the yoga session		
Tired	7	7
Calm	44	43
Joyful	51	50
Effect of yoga practice on physical well-being		
Yes	48	86
Hard to say	8	14
Body changes resulting from yoga practice*		
Improved flexibility	17	31
Better coordination	12	22
Better physical condition	9	16
Improved sleep quality	6	11
Improved appearance / figure	7	12
Reduced back pain	5	7
Effect of yoga practice on mental well-being		
Yes	50	89
Hard to say	6	11
Changes in mental well-being resulting from yoga practice**		
More relaxed	22	44
Greater well-being	12	23
Calmer	11	21
Better emotional control	5	12

Source: own research
**N = 48; the question was answered only by those respondents who noticed effects of yoga practice on their body*
***N = 50; the question was answered only by those respondents who noticed effects of yoga practice on their mental well-being*

Most of the respondents from both groups regularly participated in yoga/Zumba classes once or twice a week. Over half of the respondents additionally practiced another form of physical activity, and 40% declared that they follow a special diet. More yoga practitioners than Zumba participants were vegetarians or vegans.

In general, the body composition indicators of the yoga practitioners were superior to those of the Zumba practitioners. Although the yoga participants were heavier than the Zumba participants by 2.27 kg on average, the average percentage of body fat was lower in the Yoga group, and the mean fat-free mass was 2.95 kg higher in this group. Moreover, the yoga practitioners had a higher skeletal muscle mass, a lower visceral fat level and a lower obesity degree. The InBody analysis indicated that yoga practitioners should reduce their fat mass by –5.80 kg and increase their muscle mass by +0.95 kg on average,

whereas the Zumba practitioners should reduce fat mass by –6.34 kg and increase muscle mass by +3.41 kg. The InBody score of the yoga participants was 2.58 points higher than that of the Zumba participants, and this difference was on the threshold of statistical significance (p = 0.051). Finally, yoga practitioners had a slightly higher Waist–Hip Ratio.

Table 2. Yoga vs. Zumba – physical activity and diet.

	Yoga (N = 56)		Zumba (N = 38)		Yoga vs. Zumba	Overall (N = 94)	
	N	%	N	%	p	N	%
Weekly number of sessions of the chosen activity							
1–2 times per week	52	93	35	92	0.280	87	93
3 times per week	4	7	3	8		7	13
Additional physical activity							
Yes	35	62	22	58	0.654	57	61
No	21	38	16	42		37	39
Special diet							
Yes	24	43	14	37	0.637	38	40
No	32	57	24	63		56	60
Type of diet*							
Vegetarian	7	29	1	7	0.076	8	21
Vegan	7	29	–	–		7	18
Limiting food consumption	10	42	13	93		23	61

Source: own research

**N = 38 because the question was answered only by those respondents who were on a diet*

Table 3. Selected body composition indicators – Yoga vs. Zumba

	Yoga N = 56		Zumba N = 38		*p* (JvsZ)	Overall N = 94	
	M	SD	M	SD		M	SD
Height (cm)	166.20	4.54	165.66	6.02	0.645	165.98	5.18
Weight (kg)	66.91	10.41	64.64	15.18	0.686	66.57	11.43
BMI	24.19	3.45	23.43	6.18	0.726	24.08	4.00
PBF–Percentage of Body Fat	28.84	6.94	29.86	9.63	0.766	28.99	7.42
FFM–Fat Free Mass (kg)	47.08	4.74	44.13	6.38	0.212	46.63	5.13
SMM–Skeletal Muscle Mass (kg)	25.86	2.81	24.09	3.77	0.204	25.59	3.04
Visceral Fat Level	8.45	3.90	9.13	4.92	0.480	8.72	4.36
Obesity Degree (%)	112.61	16.03	114.95	22.46	0.586	113.55	18.93
Body Fat Mass Control (kg)	-5.80	6.40	-6.34	11.44	0.892	-5.88	7.39
Fat Free Mass Control (kg)	0.95	1.94	3.41	3.18	**0.047**	1.32	2.34
WHR–Waist-Hip Ratio	0.88	0.06	0.87	0.06	0.495	0.88	0.06
In Body Score	74.71	5.02	72.13	6.73	**0.051**	73.67	5.91

Source: own research

4. Discussion

The vast majority of Polish yoga practitioners are residents of large cities (over 300,000 inhabitants). Only 13% of the 300,000 Poles who participate in yoga classes are in smaller cities, such as Olsztyn (100,000–300,000 inhabitants) [13].

Our results indicate that the participants had a utilitarian approach to yoga (Table 1). This is consistent with reports from other surveys. For example, according to Konecki [14], motives for practicing yoga can be different, and several motives can co-exist with each other. Additionally, the bosonamacie.pl website conducted a survey among people practicing yoga in Poland in 2016, and most of the respondents pointed to several reasons that led them to participate in yoga classes. The main motive for practicing yoga was to im-

prove and maintain physical condition. Furthermore, the participants mentioned improved well-being, as well as the need to calm down and reduce stress, improve health and/or reduce pain [13]. Similarly, our respondents started their experience with yoga because they needed to calm down and relieve stress. This is not surprising because yoga is often seen as a holistic stress management technique that is associated with a physiological sequence of events in the body that reduces the response to stress [1]. Regular yoga can help to markedly relieve the symptoms of stress and teach one how to deal with it. Relaxation is a very important element in yoga, which has therapeutic significance. Yoga teaches how to control stimuli received from the outside world and how to switch off thoughts that cause mental tension [4].

One third of our respondents were motivated by improvement in health and/or reduction of spinal pain associated with yoga practice. Scientific research confirms the important role of yoga in the prevention and treatment of spinal pain. This is related to improvement in flexibility, which results from practicing this form of physical activity [15]. The fact that some respondents have simply chosen yoga to improve their quality of life may indicate that they have some knowledge about the benefits of this activity.

Part of our respondents (24%) started yoga practice to take care of their figure or to lose weight. For comparison, in the bosonamacie.pl study [13], only 8.8% of the respondents gave such answers. Yoga is not commonly associated with reduction in body fat; however, this does not mean that it has no positive effect on body weight and figure. Studies confirm that regular yoga practice increases metabolic intensity, allows for faster removal of toxins from the body and facilitates digestion, which directly affects the appearance of the figure [16].

The women were asked to indicate how they felt just before the start of their yoga classes (Table 1). The largest group of respondents said they felt tired. This is probably due to the fact that their yoga practice mainly takes place in the late afternoon or evening on weekdays, after an entire day of professional and household duties (all subjects are professionally active or study). The respondents also indicated that they felt stressed or nervous. In total, negative feelings before classes were a characteristic of just over half of the respondents. At the opposite pole, there were answers such as joy and calm. And these are the feelings that nearly all the respondents felt after a yoga session, which points to the positive impact of this activity on the well-being of its practitioners.

Noticing the effects of yoga builds a strong motivation to continue practicing it [14]. The results presented here indicate that the majority of yoga practitioners noticed its positive effects on their mental and physical health. The women felt calm, rested and relaxed, had a better state of mind, and found it easier to control their emotions. In the physical domain, they usually noticed an improvement in flexibility, motor coordination and physical condition. The practice of yoga also improved their sleep quality. Similar results have been obtained by other authors [1, 17].

The regular practice of yoga can have a positive effect on BMI [1, 18, 19]. The BMI of some women practicing yoga may be related to the vegan or vegetarian diet they often follow. In the present study, the women who practiced yoga had a slightly higher BMI than those who practiced Zumba (a difference of 0.76 kg/m^2), which could be interpreted as a benefit of Zumba. However, some researchers consider the BMI to be insufficient because it only takes into account body weight and not body composition [20]. Our research confirms this. Despite a higher BMI, the yoga practitioners had a lower percentage of body fat, a lower visceral fat level and lower obesity values (Table 3). The fact that yoga practitioners had a lower free fat mass also indicates that their body composition was better than that of the Zumba participants. Similar differences were noted with regard to skeletal muscle mass and the InBody Score. Indeed, the difference in InBody Scores was on the threshold of statistical significance (p = 0.051). These results are consistent with those of Gawrys and Slęzak [10], who noted that the body composition of yoga practitioners was better than that of non-practitioners.

It should be emphasized that the declared level of physical activity was similar in both groups: both yoga and Zumba classes were usually attended 1–2 times a week, and in each group, a similar percentage of individuals participated in additional physical activities (Table 2). A systematic review by Vendramin et al. [21] reported that Fitness Zumba has little impact on weight reduction and body dimensions. Similar results were obtained by Delextrat et al. [22]. Perhaps yoga affects body composition to a greater extent than Zumba does, helping to develop muscle tissue and control fat levels. This may be related to diet, as the proportion of yoga practitioners who follow a meat-free diet is larger than among the Zumba participants (Table 2). All yoga practices (diet, breathing, meditation, exercise) are of great importance in caring for health and wellness. Understanding how the body works as a connected whole helps to establish new healthy habits [23]. Perhaps this is why participants in yoga classes are characterized by desirable body composition values.

During the study it was observed that women practicing yoga were more likely to take part in the measurements. It is also important to note that the yoga practitioners did not have negative body images. They were interested in their body measurements and what should be improved. However, Zumba participants were reluctant to start the study and gave an impression that they were afraid of the results. Moreover, the respondents in this group frequently made negative comments about their appearance. These were unexpected responses because Zumba focuses on making maximum use of the body during the performance of choreographies, which are often very expressive [24]. A subjective evaluation of the respondents based on observations made during the course of the study indicates that the women practicing yoga have a positive attitude towards their body (even if it is not perfect), which differentiates them from those practicing Zumba. Perhaps this is due to the fact that yoga practitioners are older and have more life experience, including the experience of yoga practice, which (as research has shown) is not only a physical activity but also a means of fostering peace of mind, self-acceptance and positive emotions.

5. Conclusions

The respondents' motives for beginning yoga practice can mostly be described as practical/utilitarian. However, the experience gained during the researcher's participatory experiment shows that, over time, the spiritual side of yoga becomes more important, and asanas are no longer just a form of stretching exercise. This is also suggested by the fact that many of the respondents are vegetarians and vegans. Of course, this could be regarded as a coincidence, but it should be remembered that a meatless diet is a characteristic of yoga philosophy and people practicing yoga.

Although the differences were not statistically significant, the mean values of the body composition indicators of the yoga practitioners were superior to those of the Zumba practitioners. Thus, although firm conclusions cannot be drawn on the basis of this study alone, the results suggest that yoga may be superior to Zumba in terms of its effect on the body composition. Moreover, it can be concluded that yoga has a positive impact on both the physical and the mental health of the women who practice it.

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