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DEVELOPING EFFECTIVE PHYSICAL ACTIVITY PROGRAMS: USING KENYON'S ATTITUDE TOWARD PHYSICAL ACTIVITY INVENTORY TO UNDERSTAND INTRINSIC MOTIVATIONS IN OBESE ADULTS

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INTRODUCTION

In today's reality, obesity has become a global epidemic requiring urgent interventions. In many countries, the number of overweight and obese people has almost tripled, with 52.7% of the adult population (aged 18 years and over) overweight in most European Union Member States as of 2019[1]. Additionally, the proportion of overweight people increases with age, likely due to accelerated urbanization, robotization of production processes, the spread of digital technologies that reduce or replace physical activity (PA), and the unsustainable, unbalanced, and abundant consumption of high-calorie foods[2].

In 2018, Eurobarometer-472 published data on the physical activity of the European Union population showing that almost half of Europeans never exercise or engage in physical activity, with this proportion gradually increasing in recent years. Additionally, 12% of respondents reported spending more than 8 hours 30 minutes a day sitting, 29% spend between 5 hours 31 minutes and 8 hours 30 minutes sitting, and 40% sit between 2 hours 31 minutes and 5 hours 30 minutes daily[3].

Obesity is strongly associated with sedentary lifestyles, making overweight individuals a priority target for public health programs promoting physical activity (PA). Obesity prevention is becoming a key tool in combating non-communicable diseases caused by overweight, such as type 2 diabetes, cardiovascular disease, stroke, hypertension, certain cancers, and psychological disorders. Although obese individuals may increase their activity levels while participating in such programs, they often revert to their

[1] Overweight and obesity – BMI statistics URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Overweight_and_obesity_-_BMI_statistics#Obesity_in_the_EU:_gender_differences (date of access: 05.06.2024)

[2] WHO European Regional Obesity Report 2022. Copenhagen: WHO Regional Office for Europe; 2022. Licence: CC BY-NC-SA 3.0 IGO.

[3] European Commission. Directorate General for Education, Youth, Sport and Culture. & TNS Opinion & Social. (2017). *Sport and physical activity: Report.* Publications Office. https://data.europa.eu/doi/10.2766/483047

previous sedentary lifestyles once the programs end, as maintaining physically active behavior requires significant daily effort. PA demands more time and energy than most other health-related preventive measures, often hindered by a lack of motivation, time, or desire to exercise regularly. Overcoming these challenges requires a comprehensive solution, including programs tailored to individual needs with a gradual increase in activity, providing information about the benefits of PA, and helping develop sustained motivation to maintain it.

To effectively combat the obesity epidemic, it is essential to create environments that promote and encourage healthy lifestyles and develop approaches to reducing overweight and obesity that address the underlying social, physical, cultural, economic, and political factors influencing eating behavior and physical activity 2,[4]. This comprehensive strategy includes a wide range of methods for weight control and reduction, such as balanced diets, exercise, behavior change therapy, medication, and surgery.

Of particular importance in comprehensive long-term weight loss strategies are non-pharmacological methods based on lifestyle changes aimed at increasing physical activity. Interdisciplinary studies over the last decade have convincingly demonstrated and confirmed their many benefits, namely, their lack of side effects, cost-effectiveness and positive effects on mental health and quality of life. Moreover, lifestyle modification can be effectively combined with other obesity treatments, which significantly increases the chances of achieving the desired outcome.

Modern weight loss and physical activity promotion strategies often include tools and techniques to help change negative beliefs or create the new knowledge needed to change behaviour. Although increased awareness and knowledge, changes in attitudes and beliefs do not always guarantee changes in behaviour, they can be an important step towards an active lifestyle[5].

Interest in adults' attitudes towards physical activity (PA) has largely been driven by the significant rise in obesity and sedentary lifestyles, prompting more in-depth research to identify factors that influence goal-directed healthy and physically active behavior in adults. Recent publications report existing barriers to physical activity among adults, such as the digitalization of technological production processes, the influence of others and social class, and negative experiences of physical exercise, for

[4] Midlife Women's Attitudes Toward Physical Activity / E.-O. Im et al. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2008. Vol. 37, no. 2. P. 203–213. URL: https://doi.org/10.1111/j.1552-6909.2008.00219.x

[5] Cardinal B. J. Physical Activity Psychology Research: Where Have We Been? Where Are We Going?. *Kinesiology Review*. 2014. Vol. 3, no. 1. P. 44–52. URL: https://doi.org/10.1123/kr.2014-0036

example, during physical education at school or university [6,7]. However, these publications emphasize that restrictions on an active lifestyle are often used as excuses rather than being the main reason for not participating in physical activity.

1. Attitudes towards physical activity: theoretical framework, research design

Inactive lifestyles contribute to excess weight gain, impair health, and cause a decline in physical performance, with a slightly greater decline in women than in men, especially during the menopausal transition. Physical performance declines with age due to various biological causes and unfavorable environmental factors [8]. In contrast, physical activity can improve physical performance and help middle-aged and older adults cope with physical stress, benefiting overall health. However, despite widespread information highlighting the benefits of physical activity, knowledge alone is insufficient to induce behavior change. This is evidenced by consistently low levels of physical activity among middle-aged and older adults, particularly those who are overweight or obese. Recent research has focused on the many psychological and social factors influencing health behaviors, particularly attitudes towards physical activity[6,7,8].

Several factors significantly influence people's engagement in physical activity (PA). These include social influence from others, self-awareness of the need for PA, and one's perceived physical capabilities. Psychologist I. Ajzen's Theory of Planned Behavior provides a framework for understanding these factors[9]. The theory posits that a person's intention to perform a specific behavior, such as engaging in regular physical activity, is the strongest predictor of their actual behavior. According to TPB, intention is influenced by three key factors: attitudes, subjective norms, and perceived behavioral control. Attitudes reflect an individual's personal evaluation of a behavior. These evaluations can be positive (e.g., 'exercise makes me feel

[6] Kellmann M., Kopczynski S., Chen-Stute A. Attitudes Towards Physical Activity and Exercise Participation – a Comparison of Healthy-Weight and Obese Adolescents. *Deutsche Zeitschrift für Sportmedizin*. 2014. Vol. 2014, no. 05. URL: https://doi.org/10.5960/dzsm.2014.113

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[9] Ajzen I. Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior1. *Journal of Applied Social Psychology*. 2002. Vol. 32, no. 4. P. 665–683. URL: https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

good') or negative (e.g., 'exercise is boring')[10]. Our emotions towards an activity are likely shaped by our sensory experiences during that activity, which are in turn connected to our self-image.

In the context of physical activity interventions, a mismatch between program design and the preferences or motivations of overweight or obese participants can significantly hinder long-term adherence. To address this challenge, person-centered strategies like shared decision-making are crucial. By discussing potential involvement in a program with healthcare professionals, individuals can make informed choices that align with their needs and preferences. This collaborative approach fosters a sense of ownership and increases the likelihood of long-term adherence, as evidenced by studies where obese individuals who self-selected the type and intensity of PA accumulated more activity over time [6, 11]. Shared decision-making empowers individuals and creates a foundation for sustainable physical activity practices.

It is known that regular physical activity during adolescence can improve the quality of life in adulthood, contribute to longevity, and help maintain adequate levels of functional fitness, muscular strength, and endurance[12,13,14,15,16]. While there is considerable research on children's and

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adolescents' attitudes toward physical activity, little is known about the physical activity attitudes of obese middle-aged and mature adults. This knowledge gap hinders the development of optimal physical activity (PA) interventions for these populations, whose health status differs from that of others. It is important to focus on studying adults' attitudes toward PA across the lifespan to encourage adherence to PA and facilitate the development of effective PA interventions [17, 18]. This will help reduce chronic disease and the economic burden on health services, and likely improve health-related quality of life.

Thus, this study aimed to address this gap by identifying the relatively positive or negative personality dispositions of middle-aged obese people that motivate them to PA, using a seven-point scale for each item of Kenyon's Attitudes towards physical activity inventory (ATPA), and determine the relationship between the six ATPA domains, age, gender, education level, BMI, and waist-to-hip ratio (WHR).

The term 'attitude' is widely used but has different semantic nuances. In recent psychological and pedagogical publications, the concept of 'attitude' is understood as the way in which one object can be related to another [19]. For a modern person, 'attitude' is, on the one hand, a characteristic of a whole range of emotional, cognitive, and behavioral reactions to another person, and, on the other hand, a characteristic of a person's orientation, their life stance towards objects and phenomena of the surrounding reality. Moreover, attitudes are enduring evaluations of objects, people, concepts, or institutions that reflect our feelings toward them [20].

Scientists studying a person's attitude towards themselves, society, things, organizations, and social and other phenomena emphasize that an important component of any aspect of human activity is each individual's own attitude towards what they do. Attitudes determine whether a person will engage in an activity, continue to do it, succeed in it, and are one of the

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most important predictors of behavioral intentions in relation to physical activity[21,22].

As defined by Gerald S. Kenyon, attitude is a latent, complex, relatively stable behavioral disposition that reflects the direction and intensity of feelings towards a particular, concrete, or abstract object[23]. Sedentary lifestyles and non-participation in physical activity and sport are often due to negative attitudes towards these activities or are influenced by psychosocial and cultural factors, as well as preconceived notions that shape how individuals perceive their surroundings. Conversely, positive attitudes are generally associated with participation in physical activity. However, this explanation is not always valid, as it has been noted that some adults who do not exercise still have positive attitudes towards physical activity. This indicates that the relationship between stated attitudes and actual behavior is complex and may be mediated by other factors; thus, attitudes alone are not a sufficient indicator of behavior[4,7,9,11,17,18]. According to Kenyon, having positive attitudes towards physical activity and sport does not necessarily result in observable behavior in sporting situations, but it can foster a favorable predisposition to participate in physical and sporting activities[24].

Attitude scales have been developed and used in research to assess the degree of affect that individuals associate with certain objects. These scales provide a quick and convenient way to measure and statistically analyze a person's attitude. Gerald Kenyon developed a questionnaire for assessing attitudes towards physical activity, defined as organized, non-practice-based human movement, typically involving vigorous games, sports, calisthenics, and dance[23, 24].

Kenyon's model, which views physical activity as a social and psychological phenomenon, is a multifaceted tool for assessing attitudes towards physical activity. It is based on the premise that physical activity can be categorized into logical subsets or factors based on perceived instrumental values inherent in physical activity. In Kenyon's model,

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attitudes towards physical activity are conceptualized by six categories: Physical activity as a social experience (Social), Physical activity for health and fitness (Health and Fitness), Physical activity as the pursuit of vertigo (Vertigo), Physical activity as an aesthetic experience (Aesthetic), Physical activity as catharsis (Catharsis), and Physical activity as an ascetic experience (Ascetic) (Figure 1). While Kenyon's work focused on attitudes, not motivations, and was interrupted for several decades, it highlights the potential value of studying the intensity of attitudes towards physical activity. Understanding how strongly people endorse different aspects of exercise (e.g., enjoyment, stress relief, weight loss) can be crucial for developing new and improving existing physical activity programs. This knowledge could help identify key motivators for overweight individuals and tailor interventions to address their specific needs and preferences, ultimately increasing participation and promoting long-term adherence.

The Kenyon Attitudes towards Physical Activity (ATPA) scale employs Likert-type statements to gauge attitudes across various domains related to physical activity. This questionnaire consists of 54 statements, both positive and negative, with responses ranging on a 7-point scale from 'very strongly agree' to 'very strongly disagree'. Testing of the instrument by Kenyon and subsequent analyses demonstrated high reliability coefficients, indicating strong internal consistency within each sub-area and relative independence among the six dimensions[9].

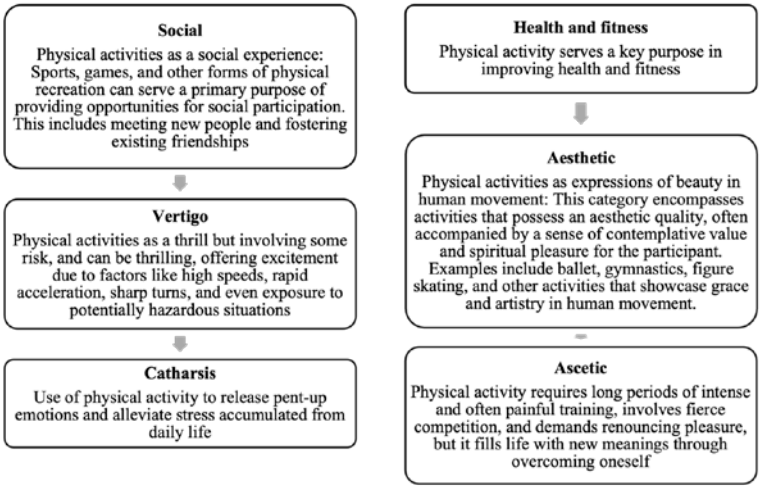

Fig. 1. Attitudes towards physical activity (Kenyon, 1968). Six domains measuring people's attitudes towards physical activity

Participants in this study were recruited via social media advertisements and from patients at the Motor Activity Centre of the Biomedical Centre of the Slovak Academy of Sciences. Eligible participants were those willing to participate and complete a personality and attitude inventory. The survey comprised two parts: the first collected demographic and anthropometric data (age, gender, education level, weight, height, waist circumference, and hip circumference), while the second used a modified questionnaire on attitudes towards physical activities. Participants rated each item on a seven-point Likert-type scale, where 1 indicated strong agreement and 7 indicated strong disagreement. Additionally, based on weight, height, waist circumference, and hip circumference, two indices were calculated: body mass index (BMI) and waist-to-hip ratio (WHR). A BMI greater than 25 kg/m² was classified as overweight, BMI between 30.0 and 34.9 kg/m² as class 1 obesity, BMI between 35.0 and 39.9 kg/m² as class 2 obesity, and BMI of 40 kg/m² or more as class 3 obesity. Since the ATPA scale has three responses below 4 (indicating positive attitudes) and three responses above 4 (indicating negative attitudes), a cut-off point of 4 was used to distinguish between positive and negative attitudes among participants. Responses were classified based on whether the mean score for each item or the total score of the attitude domain was greater than 4 for negative attitudes, and 4 or less for positive attitudes.

Statistical analysis of data was performed using the Statistical Package for Social Sciences (SPSS) version 23.0 software (SPSS Inc., Chicago, IL, USA). The type of distribution of quantitative variables was analyzed using the one-sample Kolmogorov-Smirnov criterion. When data were parametrically distributed, results are presented as mean ± SD. The relationship between variables was assessed using multiple linear regression. Gender, age, education level, BMI and WHR were included as independent variables, and the six ATPA domains were included as dependent variables. The simultaneous variable entry method was used in the multivariate analysis because the main purpose of regression model construction was to assess and compare the degree of independent influence of several predictor variables on the response variable. Independence of residuals and multicollinearity were verified by Durbin Watson and Variance Inflation Factor (VIF) statistic, respectively. Differences were considered statistically significant at a two-sided value of $p<0.05$.

2. Results of the study and discussion

Fifty-five participants were involved in the study, with 70.9% being female (n = 39), mean age 47.71 ± 12.41 years, and BMI 35.31 ± 5.50 kg/m². The remaining 29.1% were male (n = 16), with a mean age of 41.59 ± 9.51 years and BMI of 36.38 ± 5.46 kg/m². Regarding education level,

18.2% had secondary education or lower (≤ 12 years), while 87.3% had higher education (≥ 13 years). A waist-to-hip ratio above 0.85 was observed in 81.2% of the participants. The distribution of participants according to their degree of obesity is summarized in Table 1.

Table 1

Distribution of participants as per their category BMI (n=55)

Category	Distribution	Gender		Total
		women	men	
Overweight (BMI 25-29.9 kg/m^2)	Quantity, (n)	8	3	11
	% of overweight	72.7	27.3	100.0
	% of Gender	20.5	18.8	20.0
	% of total	14.5	5.5	20.0
Obese, class I (BMI 30.0 – 34.9 kg/m^2)	Quantity, (n)	7	7	14
	% of Obese, class I	50.0	50.0	100.0
	% of Gender	17.9	43.8	25.5
	% of total	12.7	12.7	25.5
Obese, class II (BMI 35.0 – 39.9 kg/m^2)	Quantity, (n)	13	5	18
	% of Obese. class II	72.2	27.8	100.0
	% of Gender	33.3	31.3	32.7
	% of total	23.6	9.1	32.7
Obese, class III (BMI ≥ 40.0 kg/m^2)	Quantity, (n)	11	1	12
	% of Obese. class III	91.7	8.3	100.0
	% of Gender	28.2	6.3	21.8
	% of total	20.0	1.8	21.8

To our knowledge, this is the first study to provide valuable information about the positive and negative attitudes toward physical activity (PA) among middle-aged women and men living with obesity. Comparisons with other studies are difficult due to methodological variations and participant age differences. The present results showed that the ascetic (self-discipline) subdomain was the highest ranked, likely due to participants' desire for personal development, increased discipline, persistence, self-confidence, and organization. The social subdomain was next, indicating enjoyment of group physical activity and the opportunity to socialize with friends and trainers. The catharsis and health and fitness subdomains followed, possibly because training helps neutralize negative emotions and heavy thoughts, providing a psychological break and promoting internal system development and strengthening. Attitudes toward the pursuit of vertigo were less positive, likely because these activities involve risk, thrill, danger, and excitement, which obese individuals may consciously avoid. The aesthetic subdomain was rated negatively, suggesting participants did not prioritize the look-related aspect of exercise or perceive it as visually appealing. Attitudes

towards PA in overweight and obese adults are presented in Figure 2, categorized by six domains, with lower scores indicating a more positive attitude.

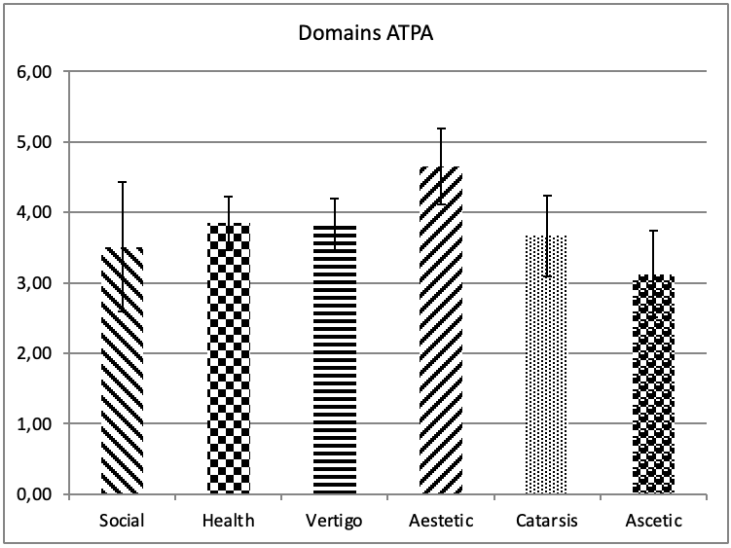

Fig. 2. Attitudes Towards Physical Activity Domains in Overweight and Obese Adults

Table 2 presents descriptive statistics illustrating gender differences in attitudes toward physical activity. Interestingly, men and women showed very similar ratings for the Ascetic, Social, and Aesthetic subdomains ATPA. Both genders prioritized activities related to **ascetic experience** (3.32 ± 0.58 for women and 3.08 ± 0.69 for men). Social interaction was also valued, with relatively high scores for both women (3.73 ± 0.49) and men (3.65 ± 0.81). However, the lowest preferences for both women and men were for activities perceived to have estetic qualities (4.36 ± 0.79 and 4.66 ± 1.05, respectively).

Table 2

Descriptive statistics illustrating gender differences in attitudes towards physical activity in women (n=39) and men (n=16)

Domain	Gender	Mean	Standard deviation	95% confidence interval for the mean	
Social	women	3,73	0,49	3,57	3,89
	men	3,65	0,81	3,22	4,08
Health	women	3,84	0,39	3,71	3,97
	men	3,77	0,50	3,51	4,04
Vertigo	women	4,0	0,40	3,87	4,13
	men	3,58	0,65	3,24	3,93
Aestetic	women	4,36	0,79	4,1	4,62
	men	4,66	1,05	4,1	5,21
Catarsis	women	3,63	0,52	3,46	3,79
	men	3,72	0,60	3,4	4,04
Ascetic	women	3,32	0,58	3,14	3,51
	men	3,08	0,69	2,71	3,45

Linear regression analyses assessing the relationship of attitudes toward physical activity by gender, age, education level, body mass index, and waist-to-hip ratio are presented in Table 3.

The results in Table 3 revealed a significant association between gender and ATPA scores for risk and thrill seeking (B: -0.422, 95% CI: -0.746 to -0.098; P = 0.012). This suggests that compared to men, women may be less likely to endorse exercise for risk and excitement. Age and BMI were significant predictors for attitudes toward PA in the catharsis domain (B: -0.019, CI: -0.291 to -0.015; P = 0.031 and B: -0.026, CI: -0.051 to 0.0; P = 0.046). BMI was associated with the ascetic domain of ATPA (B: 0.067, 95% CI: -0.002 to 0.060; P = 0.029). Older respondents and people with higher BMIs tended to have lower catharsis scores, potentially indicating a weaker association between exercise and stress relief for these groups. Education level and WHR were not associated with any of the ATPA domains (all, P > 0.05). These factors did not appear to have a significant effect on attitudes towards physical activity in this study.

Although these are useful results, they are limited by focusing on a specific population – obese, middle-aged women and men in Slovakia. These results may not be generalizable to other populations with different demographics, health conditions, or cultural backgrounds. However, this study provides valuable insights into a previously under-explored population. Future research can build on these findings by investigating attitudes towards physical activity in obese individuals from diverse countries, age groups, and genders.

Table 3

Linear regression assessing the association of gender, age, education level, body mass index and waist-to-hip ratio with the ATPA dimensions (n=55)

Variables		B	SE	β	t	P	95%CI	
Dependent	**Independent**							
Social	Gender	-0.200	0.204	-0.153	-0.978	0.333	-0.611	0.211
	Age	-0.005	0.008	-0.093	-0.620	0.538	-0.020	0.010
	Education level	0.108	0.156	0.101	0.694	0.491	-0.205	0.421
	BMI	0.003	0.016	0.027	0.186	0.853	-0.029	0.034
	WHR	-0.912	1.101	-0.129	-0.828	0.412	-3.125	1.301
Health	Gender	-0.143	0.142	-0.153	-1.003	0.321	-0.429	0.143
	Age	0.005	0.005	0.132	0.901	0.372	-0.006	0.015
	Education level	0.166	0.109	0.217	1.530	0.132	-0.052	0.384
	BMI	-0.001	0.011	-0.007	-0.051	0.959	-0.023	0.021
	WHR	-1.036	0.768	-0.205	-1.349	0.183	-2.578	0.507
Vertigo	Gender	-0.422	0.161	-0.375	-2.619	**0.012**	-0.746	-0.098
	Age	0.005	0.006	0.118	0.861	0.393	-0.007	0.017
	Education level	-0.007	0.123	-0.008	-0.059	0.953	-0.254	0.240
	BMI	-0.018	0.012	-0.193	-1.470	0.148	-0.043	0.007
	WHR	-0.968	0.869	-0.159	-1.114	0.271	-2.714	0.778
Aestetic	Gender	-0.059	0.272	-0.031	-0.216	0.830	-0.605	0.487
	Age	-0.019	0.01	-0.261	-1.915	0.061	-0.039	0.001
	Education level	0.236	0.207	0.150	1.139	0.260	-0.18	0.652
	BMI	-0.01	0.021	-0.063	-0.486	0.629	-0.052	0.032
	WHR	-2.934	1.464	-0.284	-2.004	0.051	-5.877	0.008
Catarsis	Gender	-0.065	0.164	-0.055	-0.396	0.693	-0.395	0.265
	Age	-0.013	0.006	-0.286	-2.141	**0.037**	-0.025	-0.001
	Education level	0.091	0.125	0.094	0.73	0.469	-0.16	0.342
	BMI	-0.026	0.013	-0.261	-2.047	**0.046**	-0.051	0
	WHR	-1.326	0.884	-0.208	-1.500	0.140	-3.102	0.450
Ascetic	Gender	-0.332	0.202	-0.247	-1.643	0.107	-0.738	0.074
	Age	0.003	0.007	0.059	0.412	0.682	-0.012	0.018
	Education level	0.01	0.154	0.009	0.066	0.948	-0.299	0.320
	BMI	0.029	0.016	0.258	1.871	**0.067**	-0.002	0.060
	WHR	-1.184	1.09	-0.163	-1.087	0.282	-3.374	1.005

Note: Body Mass Index – BMI; Waist-To-Hip Ratio – WHR

CONCLUSIONS

The study identified several positive aspects of physical activity for obese women and men, including: ascetic experience (self-discipline), social experience (connection with others), catharsis (stress relief), and health and fitness (improved well-being). Interestingly, participants also expressed positive attitudes towards activities associated with vertigo, which typically involve risk and excitement. This finding may require further studies.

Women, on average, showed a weaker endorsement of exercise motivated by risk and thrill-seeking compared to men. Older adults and those with higher BMIs tended to have a weaker association between exercise and stress relief (catharsis). Interestingly, individuals with higher BMIs reported more positive attitudes towards the ascetic subdomain, which emphasizes self-discipline and weight loss through physical activity. Education level and waist-to-hip ratio did not significantly influence attitudes towards physical activity in this study.

This study suggests that healthcare professionals should consider individual differences in attitudes towards physical activity among obese adults. By tailoring interventions to address the specific PA subdomains that resonate most with each patient, healthcare professionals can increase the likelihood of program success.

SUMMARY

Identifying factors associated with physical activity (PA) behaviors in adults is critical for guiding effective interventions that promote sustained PA throughout life. Understanding attitudes towards PA plays a vital role in this process, as positive attitudes are strong predictors of adherence. This study investigated attitudes towards PA in obese adults, exploring potential differences by gender, age, education level, and BMI. Using a questionnaire, we found that both men and women emphasized the importance of PA for ascetic experience (self-discipline) and social interaction. However, participants did not view PA as an aesthetic experience (enjoyable for its visual appeal). The results of this study provided valuable information on the positive and negative attitudes towards physical activity of obese middle-aged women and men. The differences and similarities in positive attitudes towards PA by gender support the notion that the positive and negative attitudes of women and men are distinct components and should therefore be studied and considered independently. Further research should be conducted with obese individuals who are within weight control programs to measure any changes in their attitude toward physical activity throughout and following the program.

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