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Original Investigation

Nomophobia and the Values Recognized by Physical Education Students

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Abstract
Purpose: The study aimed to determine the level of nomophobia and to find out the values recognized by first-year students of the Faculty of Physical Education.
Method: The study, conducted in 2024, involved 171 students of a sports college. The study group consisted of 116 men and 55 women, and the average age of the study subjects was 19.95±1.58 years. To collect empirical material, two standardized tools, the Nomophobia Questionnaire (NMP-Q) by C. Yildirim and A. Correia adapted by M.W. Czerski (2021) and Scheler's Hierarchy of Values adapted by P. Brzozowski (1995), were used.
Results: The study participants have shown varying levels of nomophobia, but no significant differences in the level of nomophobia were observed between female and male students (χ^2= 5.64; *P*= .06; Vc= .18). The highest percentage of women and men were in the moderate and low range groups. However, significantly greater test scores were obtained by women in the NMP-Q ($F_{1,167}$= 6.05; *P*= .015; η^2= .035). No significant differences were found between athletes and non-athletes in the four analyzed nomophobia factors ($F_{1,167}$ = .13; *P*= .72; η^2 < .001). The highest ranked value in the students surveyed is physical fitness and strength, while holy values and religious sanctities are the least important.
Conclusions: Separation anxiety in relation to the smartphone does not affect most of the students surveyed. Gender differentiates the severity of nomophobia (results of scores). Cultivation of values related to physical culture is characteristic of the studied group. Participation in sports does not differentiate the results in terms of the values recognized by female and male physical education students.

Keywords: Scheler's values, nomophobia, Physical Education students, training sports

Introduction

"... If a human takes the right place, they will not experience anxiety".[1]
Exploring the world of values of young adults and their attitudes towards commonly used smartphones were the main objectives of the research undertaken. For this reason, among others, the subject matter of this study fits into the humanistic and social aspects of physical culture.
It seems that knowledge of the hierarchy of values of contemporary youth is indispensable as referring to it, in various social contexts, will allow for building effective tools of so-called change, or influence. As Wojciszke writes, *a value is a positive attitude towards an abstract life goal - an end state towards which one should aim or a specific course of action*.[2]
Behavior consistent with personal values is part of the therapy of acceptance and commitment in social functioning.[3] One of the current problem areas in people's lives are difficulties, and not only technical ones, but broadly speaking, emotional difficulties concerning anxiety-free use of smartphones. The phenomenon of nomophobia is described as a variation of separation anxiety, the fear of being separated from one's smartphone or being unable to use it at any time.[4]
At present, we observe a dynamic increase in nomophobia among young people,[5] and even children.[6] This is worrying and threatens the proper mental, physical, and social development.[7] The problem seems particularly interesting in the case of students who train sports versus those who do not do it. The results of scientific research are not conclusive in this regard. A study of Chinese, Taiwanese, and Malaysian respondents has found a surprisingly positive relationship between physical activity and nomophobia, although a certain level of nomophobia and self-stigmatization of body weight may favor an increase in the level of physical activity undertaken.[8] Other studies show an inconclusive association between nomophobia and physical activity. Nomophobia is positively associated with physical activity among young Chinese women, but this connection has not been confirmed for male subjects.[9] The literature also provides examples of research concerning the above phenomenon in relation to men and women. It appears that women often have higher rates of nomophobia than men. [9-12]
The intensity of life, the dynamics and constant changes, the demands, the axiological chaos - these are undoubtedly not the only, but frequently observed features of the modern world and the reality in which we live today. It is, therefore, a difficult reality, often requiring rapid decision-making, uncompromising, uncertain, posing various threats, both to individuals, their well-being and freedom, and to the social community in which they

live.[13] In addition, the uncertainty of tomorrow and what the future will offer are factors that can cause anxiety, a sense of ineffectiveness, withdrawal and disbelief in one's resources. All of this requires the modern person to be constantly ready to take action of a cognitive, emotional, social, or moral nature. This is because today's world is changing very dynamically and in all possible areas which means that there is a constant need to learn something new, to learn new behaviors, to evaluate, to analyze. Life, in its current difficult reality, should not, after all, be an "escape from", but should be a "striving toward". It cannot be an escape from responsibility, goodness, truth and beauty, but must be a striving towards attestation of these values in one's own life through the choices and decisions one makes, the resolution of moral dilemmas, judgments, and actions.[13] However, values are not always clearly definable, and good and evil are not always unequivocally named. Therefore, a modern individual, especially a young one, can easily get lost in this axiological chaos and it is not always easy for them to find an answer to the question of what is good and what is not. Czapiński believes that every day we are provoked to *struggle with ourselves, to make endless choices, to discipline, to anticipate, to restrain, to push, to worry, to blame.* [13]

Living one's life in harmony with oneself and relying on higher values, can give greater strength to face difficulties, as well as provide resources to overcome them. It also gives some protection against possible dangers like depression and anxiety, among which nomophobia is so common today.

In relation to all such problems, the aim of the research undertaken on a group of physical education students was to identify the phenomenon of nomophobia in the context of values recognized by young people.

The aim of the present research was to study the severity of nomophobia and the world of values in relation to Scheler's concept. The study problem concerned the differences in the studied variables due to gender and undertaking versus not undertaking physical activity and the correlation between values and nomophobia and its indicators in a group of first-year students.

Methods

Participants

The study, conducted in 2024, involved 171 students. The selection of participants for the study was purposeful. There were 116 men and 55 women in the study group and the average age of the respondents was 19.95±1.58 years, 19.64±1.09 years for women and 20.09±1.74 years for men. The fact of training sports was declared by 94 people, including 23 women and 71 men. The average length of training for women was 9.04±3.23 years and for men 9.80±4.16 years. No significant differences between female and male trainees with regard to the length of their training experience have been found. The inclusion criterion for the study was the respondents` willingness to participate in the research. Participants who did not complete all tests were excluded.

Study Design

The research was conducted using two questionnaires (NMP-Q and the Scheler Values Scale). The diagnostic survey method was used. The research was carried out in April and May 2024, at the university. The study included all first-year students of physical education.

Instruments

Two standardized tools were used in the study, i.e. *the Nomophobia Questionnaire (NMP-Q)* by Yildirim and Correia adapted by Czerski,[14] and *Scheler's Hierarchy of Values* adapted by Brzozowski.[15] The NMP-Q questionnaire consists of 20 items and measures the level of phobia severity regarding smartphone use. The respondents rated individual statements by relating them to a 7-point Likert scale, where 1 means 'strongly disagree' and 7 means 'strongly agree'. The Polish version has good psychometric properties (ibid.). The particular aspects of nomophobia include: (1) Inability to communicate - is the feeling of losing the ability to communicate with others instantly; (2) Loss of connection - refers to the feeling of losing the ubiquitous connectivity that smartphones enable; (3) Lack of access to information - refers to the feeling of discomfort that is associated with the loss of access to information via smartphones; (4) Giving up convenience - refers to the feeling of giving up the convenience that smartphones provide.[14,16] People who obtained a score of 20 are considered not to have nomophobia. Mild nomophobia is defined by a score of 21-59, moderate nomophobia by a score of 60-99, and high nomophobia by a score of ≥100 (in relation to the maximum score, which is 140).[17] *Scheler's Hierarchy of Values* consists of fifty values that form six primary scales: hedonistic, vital, esthetic, truths, moral, and holy. In addition, there are four factor subscales, i.e. physical fitness and strength, endurance, secular sanctities and religious sanctities. The tool has gender-specific sten norms for each scale.[15]

Statistical analysis

Basic statistical measures, arithmetic means and standard deviations (± SD) and medians were used to characterize groups of students in terms of the studied variables. The Shapiro-Wilk test was used to check the normality of the variables studied. The assumption of homogenity of variances in the groups was assessed with Levene's test. The significance of differences in the mean values of the analyzed variables was assessed using two-factor analysis of variance (ANOVA) in the scheme (GENDER × GROUP). In the case of significant ANOVA effects, detailed comparisons were made using the Tukey post hoc test. The partial eta-squared (η^2) was used as a measure of the effect size. The following classification was adopted: .01 – small effect, .06 – medium effect and .14 – large effect. The relationship between NMP-Q points and sten scores in Scheler's values was assessed using the Pearson correlation coefficient. The χ^2 test was used to compare the level of nomophobia for men and women. Analyses were performed using the statistical package Statistica 13.3 PL (StatSoft, USA). The significance level of $\alpha = .05$ was adopted.

Results

The level of nomophobia of female and male AWF students was determined on the basis of the sum of scores obtained in the NMP-Q questionnaire. No significant differences in the level of nomophobia were observed between female and male students (χ^2= 5.64; *P*= .06; Vc= .18). (~~χ^2~~= 5.64; *P*= .06; *Vc*= .18).

A moderate level of nomophobia was found in half of the students of the sports university, while a high level was found in every 20th respondent (Figure 1). Despite the lack of differences in the levels of nomophobia between women and men, significant differences were found in the test scores obtained by women and men in the NMP-Q. Women were characterized by higher values obtained in the NMP-Q test compared to men. ($F_{1,167}$= 6.05; *P*= .015; η^2= .035). In contrast, no significant differences were found in the levels of nomophobia between female and male students

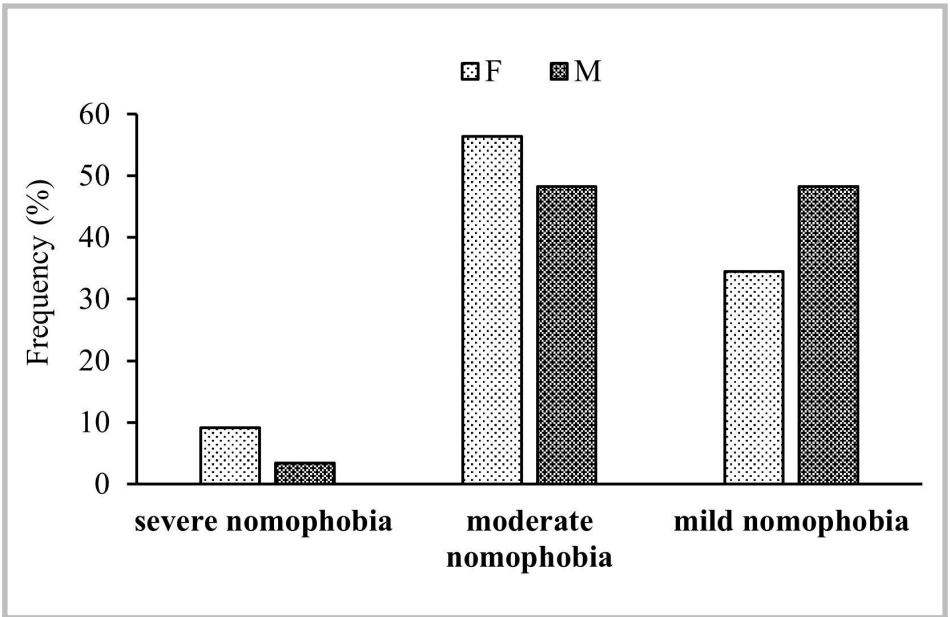

Figure 1. Level of nomophobia in female students (F; n = 55) and male students (M; n = 116)

training competitive sports and those not training ($F_{1,167}$ = .13; *P*= .72; η^2 < .001). The was no significant interaction (gender x sport) for the NMP-Q test scores ($F_{1,167}$= .068; *P*= .79; η^2 < .001). The analysis of the four factors that influence the level of nomophobia has shown that only the factor related to giving up comfort differentiates between women and men ($F_{1,167}$= 7.36; *P*= .007; η^2 = .042), with women scoring higher than men (*P*< .01). In contrast, there were no significant differences between athletes and non-athletes in the four factors analyzed (Table 1).

Table 1. Nomophobia and Scheler's values with (T) and without (NT) training for women (F) and men (M).

	Tests	F_T (n = 23)	F_NT (n = 32)	M_T (n = 71)	M_NT (n = 45)	F-	*P-value*	η^2
		mean ±SD Median						
NMP-Q	Nomophobia (pt)	69.91±21.65* 68.00	69.56±21.17* 70.00	62.24±19.72 64.00	60.07±22.33 56.00	6.04	.015	.034
	I. Inability to communicate (pt)	24.74±8.94 24.00	25.78±8.68 28.00	23.24±9.50 23.00	21.40±8.90 19.00	3.74	.06	.022
	II. Loss of connection (pt)	13.22±6.11 13.00	12.63±6.94 10.50	10.72±5.87 9.00	11.31±5.66 10.00	3.56	.06	.021
	III. Lack of access to information (pt)	15.70±5.23 16.00	15.09±5.45 15.50	14.14±4.83 14.00	13.98±5.74 14.00	2.33	.13	.014
	IV. Giving up convenience (pt)	16.26*±6.43 15.00	16.06*±5.55 16.50	14.14±5.07 14.00	13.38±4.89 13.00	7.36	.007	.042
Scheler's values	Hedonistic (sten)	6.96±1.33 7.00	7.09±1.57 7.00	7.18±1.70 8.00	7.04±1.74 7.00	.10	.75	< .001
	Vital (sten)	7.26±1.39 7.00	7.03±1.60 7.00	7.04±1.48 7.00	6.53±1.39 6.00	2.15	.14	.013
	Esthetic (sten)	5.57±1.47 6.00	6.19±1.49 6.00	5.94±1.56 6.00	5.82±1.50 6.00	.001	.97	< .001
	Truths (sten)	5.57±1.50 6.00	6.09±1.71 6.00	5.94±1.43 6.00	5.80±1.53 6.00	.03	.87	< .001
	Moral (sten)	5.17±1.27 5.00	5.91±1.49 5.00	5.70±1.77 6.00	5.87±1.50 6.00	.86	.36	< .01
	Holy (sten)	4.26±1.63 4.00	4.69±1.89 4.00	5.01±1.89 5.00	4.38±1.66 4.00	.55	.46	< .01
	Physical fitness and strength (sten)	7.52±1.34 7.00	7.22±1.52 7.00	7.34±1.62 7.00	7.04±1.52 7.00	.49	.49	< .01
	Endurance (sten)	6.83±1.77 6.00	6.38±1.88 6.00	6.56±1.57 7.00	5.98±1.57 6.00	1.42	.23	< .01
	Secular sanctities (sten)	4.70±1.66 5.00	5.09±1.87 5.00	5.21±1.91 5.00	4.60±1.68 5.00	.001	.97	< .001
	Religious sanctities (sten)	3.87*±1.79 4.00	4.19*±1.69 4.00	5.06±2.16 5.00	4.60±1.85 5.00	6.05	.015	.035

Legend: F- F-Ratio, * - significance level compared to men (M); η^2 - eta-squared, pt – points

Based on the sten ranking of Scheler's Hierarchy of Values, it has been noticed that, for both female and male students, physical fitness and strength is the highest ranked value, while holy values and religious sanctities are the least important (Figure 2).

Analyzing the results of Scheler's Hierarchy of Values, significant differences were found between women and men only in relation to religious sanctities ($F_{1,167}$= 6.05; *P*= .035; η^2= .035), with a higher score observed in male students than

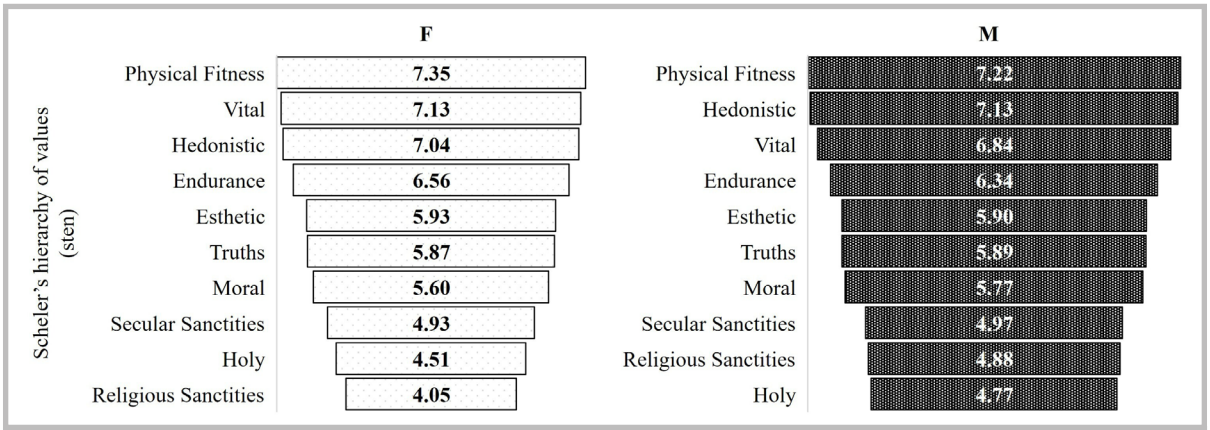

Figure 2. Scheler's hierarchy of values of female (F; n=55) and male students (M; n=116) surveyed

in female ones. Training sports does not differentiate the scores on Scheler's Hierarchy of Values of female and male students (Table 1).

For both groups the total scores obtained in the Nomophobia Questionnaire (NMP-Q) positively correlated with hedonistic values (r= .252; *P*= .001), esthetic values (r= .170; *P*= .026), holy values (r= .190; *P*= .013), and religious sanctities (r= .209; *P*= .006).

Discussion

The results of a study by Greek researchers showed that moderate levels of nomophobia were observed in more than half of the students surveyed (59.6%). Non-working women aged 18-20 showed higher levels of nomophobia than working women. The research indicates a link between nomophobia and low self-esteem.[11]

In contrast, a study involving nearly 500 Pakistani students found that severe nomophobia characterized more than 40% of the respondents, while the moderate form affected nearly half of them.[18]

A study of nomophobia among nursing students from Spain and Portugal found that adolescents had significant levels of nomophobia, with Portuguese adolescents scoring higher than their Spanish peers.[19]

A Spanish study of students in the Faculty of Educational Sciences at the University of Granada indicated a bigger presence of nomophobia in females and in younger people.[10]

García-Masip et al. in a study on Spanish adults showed a correlation between personality traits and nomophobia. They noted that extroverted individuals and those with dysfunctional obsessive beliefs showed a greater tendency towards phone addiction than those without such traits.[20]

Peruvian students are knowledgeable about the effects of excessive phone use on physical health, mental health, addiction, interpersonal interactions, and academic performance. However, few acknowledge that excessive phone use in an academic situation can affect them negatively.[21]

Teachers, pupils and their families must understand the harmful effects of mobile phone use at school.[10]

Mengi, Singh, and Gupta studied the phenomenon of nomophobia among Indian medical students. They found that there was a significant association between nomophobia and academic performance and concentration. A significant mobile phone addiction and a tendency towards behavioral control disorders were prevalent in the students studied.[22]

Al-Mamun's empirical analysis showed that nomophobia among Bangladeshi students was significantly associated with smartphone and Facebook addiction, as well as insomnia and depression.[23]

A clear correlation between the tendency towards nomophobia and high levels of loneliness and attachment anxiety was noted among Chinese students.[24]

The results of a study by Abdola et al. involving more than 500 students revealed that nomophobia was associated to a greater extent with symptoms of anxiety and to a lesser extent with symptoms of depression and stress. At the same time, no relationship was found between the phenomenon of nomophobia and insomnia or obsessive-compulsive disorder.[25]

Research by Jahrami et al. indicated a direct correlation between poor sleep quality and insomnia in adults and a tendency towards nomophobia.[26]

The issue of nomophobia was also of interest to other Chinese researchers.[27] It was found that neuroticism was an important predictor of nomophobia. In addition, differences were observed between female and male study groups with regard to the severity of nomophobia. Women had higher levels of nomophobia than men.

In a study conducted among Polish first-degree Sports students, the prevalence of nomophobia was noted to be moderate. The overall index of nomophobia and one of its components (inability to communicate) showed a statistically significant difference by gender. Women scored higher.[28]

According to the results of a study by the Public Opinion Research Centre (CBOS), in 2019 the values most respected by Poles included family happiness (80%), maintaining good health (55%), peace of mind (48%), a circle of friends (45%), respect of other people and an honest life (42% each).[29]

The results of research conducted on a group of young Europeans aged 19-36 from 12 countries, including Poles, showed that for Poles in this age group, the most important things in life include health (emotional and physical) and personal relationships, followed by professional success and commitment to sustainable development. Emotional health is most important for Polish and Portuguese people (over 95%), although their peers from other countries also consider it important (88%). Only about one in two respondents from Poland view the use of social media as a very or quite important aspect of life and they use them mainly for utilitarian purposes. Merely 29% of Polish respondents have

experienced FOMO, i.e. the fear of missing out when using social media.[30]

A study of Asian university students in Singapore indicated a positive relationship between spiritual values and intrinsic goals, which in turn have a strong connection with subjective well-being. The authors conclude that developing spiritual values can promote subjective well-being, enabling students to find meaning and purpose in life.[31]

In the course of the research carried out on junior high school students, it was established that they primarily value allocentric, pleasure, and pro-social values. Family values were ranked low, and material values were not recognized at all in that study group. There was no statistically significant difference found in the choice of respected values between the respondents coming from rural and urban areas.[32]

The research conducted among students of teaching faculties at Kraków universities showed that the highest-ranked values by the surveyed students included moral values, truths (2), religious sanctities (3), hedonistic values (4), and holy values (5). In contrast, the lowest ranked values were esthetic values (10), endurance (9), vital values (8) physical strength and fitness (7). Statistically significant differences by gender were found for the value of truths (valued higher by men) and religious sanctities (valued higher by women).[33]

An empirical analysis of a group of 200 young Varsovians aged 20-35, professionally active and characterized by a relatively stable financial situation, revealed that the most important values for them were their own and their family members' health and family happiness. On the other hand, living according to religion and being politically active appeared to be the least important. There was observed a shift away from certain traditional values related especially to religion and treating it as an important signpost in everyday life.[34]

In turn, the research conducted by Brojek, Turosz, and Bochenek proved that the surveyed students of Physical Education from Biała Podlaska most often indicated health as the most important among life goals, aspirations, and ultimate values. Other values that obtained the highest scores were personal values: mature love, respect for each other, true friendship, and securing existence of the family. Women were far more likely to rank personal values higher: respect for each other, true friendship, and personal freedom, while men placed social values higher than women: national security, the beauty of the world, and world peace. The instrumental values that men chose most often were honesty, ambition, readiness to love, responsibility, self-reliance and perseverance. Values such as ambition, responsibility, self-reliance, and tolerance were more often placed higher by women. Men ranked logical thinking, ingenuity, and ability higher in their value systems.[35]

Samełko studied the values of Physical Education students in Warsaw. No statistically significant differences in the respected values were observed between the female and male respondents. A statistically significant difference was observed in the comparison between first- and second-degree students with regard to vital, moral, and holy values. The highest ranked values in the study group were moral values and truths and the lowest esthetic values. [36]

On the other hand, research conducted among students of Pedagogy at the Warsaw University of Life Sciences (SGGW) revealed that pro-social, pleasure, and allocentric values found the greatest appreciation in the studied group, while material and family values were valued the least. It turned out that young respondents attach more importance to short-term pleasures than to long-term ventures, such as starting a family or buying a flat.[37]

Dróżka examined values in the work of teachers over a period of 25 years. The author noticed a shift from ethos values (fulfilling a mission, working for the homeland, responsibility for the young generation) to values more related to everyday work and promotion.[38]

Cekiera conducted a research project to identify similarities and differences in the value systems of students from Hungary and Poland. Hungarian students were less likely to declare themselves as believers and gave less importance to religion but, at the same time, were more likely than Polish students to admit that the Christian system of values should be the basic foundation for Europe. In both Poland and Hungary, it is the female students who are more liberal in their views, while the male students are conservative and refer more often to tradition. [39]

The literature emphasizes the importance of interoception of moral values in the teacher's work. For a teacher to professionally educate towards moral values, they must fulfil two conditions: undertake their own axiological education and bear witness to interoceptions of moral values.[40]

Practical Applications

The phone in conjunction with adherence to holy values and religious sanctities may be a source of security for a young person, as suggested by the significant correlations between the studied variables. Therefore, there appears to be a need for social media applications and content to promote religious values. It would be worthwhile to recognize who is an authority for today's youth and to present online profiles and testimonies of people who are guided by higher values in their lives, including the holy ones, which could often protect young people from losing the meaning of life, but only if these testimonies explicitly point to the need of entering the real world and real relationships, both with other people and with God.

Conclusions

1. Separation anxiety in relation to the smartphone does not affect most of the students surveyed.
2. Students, both female and male, have identified physical fitness and strength as the most respected Scheler`s value. Internalization and strong identification of the respondents with this value is a predictor of not only physical but also mental health.
3. Gender differentiates the severity of nomophobia. The greater number of scores obtained in the nomophobia test concerned the examined women, which is probably connected with the fact that women access social media more often and spend more time on them due to the topics found there.
4. Physical activity does not differentiate the study subjects in terms of nomophobia and values, which may be related to the fact that non-training students also have a high level of physical activity resulting from their study program.
5. For the modern young person, regardless of their sporting level, the phone is a source of pleasure, hence the significant correlation between hedonistic values and nomophobia.
6. Nowadays, there is an increased phenomenon of body worship and therefore the smartphone seems to be a good source of information for taking care of one’s esthetic qualities.
7. Given that the smartphone nowadays also gives easy access to religious content, for the respondents who place religious values highly in their hierarchy of values, smartphone

inaccessibility may cause fear of the lack of satisfaction of spiritual needs.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Ethical Committee approval

Józef Piłsudski University of Physical Education in Warsaw, Senate Research Ethics Committee SKE 02/2024.

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Conflicts of interest

The authors have no conflicts of interest to declare.

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Author-s contribution

Conceptualization A.K., J.D., methodology, A.K., J.D. and K.M.; software A.K., K.M., validation A.K., formal analysis K.M., A.K. investigation A.K., J.D., K.M., resources, A.K., J.D., K.M., M.M., P.W., data curation A.K., K.M., writing - original draft preparation, A.K., J.D., writing review and editing, A.K., J.D., M.M., P.W.; visualization A.K., J.D., K.M.; supervision, A.K., project administration, A.K. All authors have read and agreed to the published version of the manuscript.

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