

Shaping the Body, Shaping the Mind: Body Esteem and Emotions in Gym Training

Anna Wołpiuk-Ochocińska¹

*University of Rzeszów, Faculty of Health Sciences and Psychology,
Department of Psychology*

<https://orcid.org/0000-0002-4316-7308>

Abstract

Objective: Physical activity is widely recognized as an important factor supporting psychological well-being; however, its emotional outcomes may depend on individual motivations and body-related self-perceptions. The present study examines the relationship between gym-based physical activity, body esteem, and positive and negative emotional experiences as key dimensions of psychological well-being.

Method: The study involved 209 adult gym users who completed the *Body Esteem Scale* (BES) by Franzoi and Shields and the *Scale of Positive and Negative Experience* (SPANE) by Diener et al. Participants also provided information regarding their exercise motivations and training characteristics. Correlational analyses and regression models were applied to examine relationships between body esteem, exercise motivation, and emotional experiences.

Results: Exercise duration was positively associated with body esteem, particularly with perceptions of physical strength and fitness. Recreational motivation for gym use was positively correlated with positive emotional experiences, whereas rehabilitation-related motivation was associated with a stronger sense of physical attractiveness. Affective balances and overall affective balance showed significant positive correlations with all dimensions of body esteem, including physical fitness, body strength, and sexual attractiveness. Regression analyses indicated that recreational motivation and body esteem dimensions related to physical condition and strength were significant predictors of positive emotional experiences.

Conclusions: The findings suggest that gym-based physical activity can support psychological well-being primarily through positive body esteem and intrinsically oriented exercise motivations. Emphasizing recreational and fitness-related goals, rather than appearance-focused outcomes, may enhance the emotional benefits of gym participation and contribute to healthier body-related self-perceptions. Interestingly, the lack of significant differences

¹ Correspondence: awolpiuk@ur.edu.pl.

between gym users and gym non-users may suggest that the benefits of physical activity may depend less on the specific form of exercise and more on the reasons for practicing it and the individual's perception of their own body.

Keywords: physical exercise, gym, emotional balance, positive and negative experiences, body image, body self-esteem

Health and physical fitness are widely recognized as essential determinants of well-being and social functioning. Regular physical activity not only prevents lifestyle diseases but also improves cardiovascular, respiratory, and musculoskeletal functioning (Drygas et al., 2008; Khaw, 2006; Ostreġa, 2017). Beyond the physical domain, numerous studies demonstrate that exercise contributes to mental health, including stress reduction, lower prevalence of depression, and greater resilience in coping with everyday challenges (Breslin & Leavey, 2019; Chen et al., 2013; Craft & Landers, 1998). Individuals who regularly engage in physical activity experience higher levels of happiness, greater life satisfaction, and better mood regulation (Penedo & Dahn, 2005; Stolarska et al., 2019; van Woudenberg et al., 2020). Participation in sports and fitness activities also fosters social integration by offering opportunities for group belonging and enhanced self-confidence (Góreczka & Garczyński, 2017). Moreover, recent research indicates that the relationship between physical activity, particularly gym-based exercise, and psychological well-being is complex and not uniformly positive. While physical activity is generally associated with better mental health outcomes (Chekroud et al., 2018; Pearce et al., 2022; Singh et al., 2023), its effects appear to depend on contextual and individual factors.

An important psychological consequence of physical activity is its relationship with body image and body esteem. Research consistently demonstrates that individuals who engage in regular exercise tend to report greater satisfaction with their bodies, higher confidence in physical abilities, and an increased sense of control over their health, even when measurable physical changes remain modest (Aşçı, 2002; Cohen et al., 2020; Halliwell, 2013; Tod et al., 2021). Positive body esteem has been associated with numerous indicators of psychological functioning, including reduced levels of anxiety and depression, lower social withdrawal, and enhanced self-esteem and subjective well-being (Grogan, 2008).

However, this relationship is not unidirectional. The impact of exercise on self-perceptions depends largely on the goals and attitudes that guide the activity. An excessive preoccupation with appearance or exercising solely for aesthetic enhancement may foster body dissatisfaction, frustration, or stress when expected outcomes are not achieved (Hausenblas & Fallon, 2006). In more severe cases, such motivations have been linked to maladaptive behaviors, such as restrictive dieting, compulsive exercise, and symptoms of eating disorders (Johnson & Wardle, 2005).

Taken together, these findings suggest that physical activity is a double-edged phenomenon: it may strengthen psychological well-being when grounded in health, fitness, or recreational motives, but it may also undermine it when

strongly tied to appearance-related self-evaluations. This ambivalence makes gym users a particularly relevant population for investigation, as gym-based training often combines health- and performance-oriented goals with culturally reinforced ideals of attractiveness.

Research highlights the role of exercise motivation as a crucial factor shaping psychological outcomes (Kilpatrick et al., 2005). Appearance-based motives have been linked to less favorable body image outcomes, whereas intrinsic motives, such as enjoyment or recreation, are associated with more positive self-perceptions (Homan & Tylka, 2014). Engaging in workouts for health and recreation is generally associated with a more positive body image and greater emotional benefits, whereas appearance-driven motives tend to correlate with negative affect and lower body satisfaction (Contractor & Rasquinha, 2023; Ginis et al., 2012). Gym-based training, which combines elements of fitness, strength, and aesthetic improvement, provides a unique setting to explore how such motivations influence both body esteem and emotional well-being.

Despite a growing body of literature, there is still limited understanding of how gym users function in terms of their body esteem and affective experiences. While many studies emphasize the benefits of physical activity in general, fewer works specifically examine the nuanced interplay between gym-based exercise, body evaluation, and emotional outcomes.

Methods

Research Objectives

The aim of the study was to explore the relationship (if any) between physical activity, body esteem, and psychological well-being, understood as experiencing positive emotions in daily life, as well as to expand knowledge about some specific features of gym-based workout and the motivations associated with it. The following research questions were posed:

1. What is the relationship between body esteem and positive/negative experiences among gym users?
2. What is the type of motivation for exercise associated with the level of positive or negative emotions experienced by the participants and their body esteem?
3. What is the relationship between exercise motivation, body esteem, and positive or negative experiences or emotions?

Subjects

The pilot study encompassed 209 individuals (gym users), including 149 females aged 16 to 47 years (Poland). The mean age was $M = 21.89$, $SD = 3.66$ years for females, and $M = 22.12$, $SD = 3.41$ for males. The female and male

groups did not differ statistically significantly in terms of age. The group of gym non-users included 75 persons, including 60 females. The mean age was $M = 20.55$, $SD = 1.66$ years for females and $M = 20.73$, $SD = 1.62$ for males.

The criteria for inclusion of people in the study group included active use of the gym and informed consent to participate. Exclusion included those cases in which the questionnaires showed lack of data and lack of regular involvement in gym activity. Cases of people declaring complete lack of use of gym were classified into the comparison group (gym non-users).

Research Procedure

Data were collected using an online survey administered via Google Forms. Participants were informed about the anonymous nature of the study prior to participation. Before completing the questionnaire, participants provided informed consent. They then proceeded to the survey, which included questions on sociodemographic characteristics as well as measures of body esteem and affective balance.

Participation in the study was voluntary. Respondents were informed that they could withdraw from the study at any time without providing a reason.

Measuring Tools

1. A questionnaire developed by the present author was used to assess participants' motivations for gym use and workout duration. The instrument included single-item measures. It represents key motives for exercise (e.g., recreation, health improvement, appearance, rehabilitation), rated on a 4-point Likert scale (e.g., 1 – *strongly disagree* to 4 – *strongly agree*). A 4-point Likert scale was used to reduce the potential for central tendency bias by eliminating the neutral midpoint and encouraging respondents to provide a more decisive answer. Previous research suggests that even-numbered response formats may improve data quality in attitudinal research by limiting respondents' tendency to select neutral options (Dolnicar et al., 2011; Garland, 1991; Krosnick & Presser, 2010).

Due to the single-item nature of the measures, internal consistency (e.g., Cronbach's alpha) was not calculated. The use of single-item indicators was justified by the exploratory character of the study and the intention to capture distinct, conceptually clear motives without overburdening participants. Previous research suggests that single-item measures may be appropriate when assessing straightforward, unidimensional constructs such as specific behavioral motives (Diamantopoulos et al., 2012; Gogol et al., 2014). Nevertheless, the questionnaire had not been previously validated, which should be considered a limitation of the study.

2. *The Body Esteem Scale* by S. Franzoi and S. Shields in the Polish adaptation by M. Lipowska and M. Lipowski (2013). The instrument is used to evaluate

the various aspects of one's body. It consists of 35 items grouped into three subscales for females and males. The subscales for females are *Sexual Attractiveness* (SA), which involves those body parts that cannot be changed through exercise; *Weight Concern* (WC), which describes those body parts that can be improved via exercise and diet; and *Physical Condition* (PC) associated with parameters such as stamina, strength, and agility. The subscales for males include *Physical Attractiveness* (PA) focused on the physical features related to perceptions of handsomeness; *Upper Body Strength* (UBS) related to male strength and virility; as well as *Physical Condition* (PC) related to evaluation of one's stamina, strength, and agility. Responses are given on a Likert scale, with the results being the sum of scores for each subscale. The higher the score, the greater the acceptance of one's body. The raw results were converted for qualitative analyses into sten results. Sten scores were interpreted according to standard norms, where values between 4 and 6 indicate average levels.

3. *The Scale of Positive and Negative Experience* (SPANE) (Diener et al., 2009) as adapted into Polish by Ł. Kaczmarek and B. Baran. The instrument measures positive and negative emotions experienced over the past month as an indicator of one's general well-being. One can also calculate the overall affective balance. The higher the score, the greater the intensity of positive or negative emotions recently experienced by the individual.

Results

As results for the measured variables did not follow a normal distribution, non-parametric methods were used to examine correlations and differences between the variables. Statistical analyses were conducted using SPSS ver. 22 software.

A comparison of gym users and those who do not use the gym in terms of affective balance (SPANE) shows that these groups do not differ significantly in terms of dimensions related to positive and negative life experiences (SPANE), also taking into account gender as a facilitator.

Women who use the gym also do not evaluate their bodies more positively than women who do not use the gym (*Weight Concern*: $z = -1.46$, $p = .144$, *Physical Condition*: $z = -1.00$, $p = .317$, *Sexual Attractiveness*: $z = -0.09$, $p = .992$). The body esteem of female gym users and non – users was on average level. The *Sexual Attractiveness* dimension was at an average level as well. Similarly, females evaluated their physical fitness at the concern at 4th sten and weight the 5th sten, also indicating average ratings. This suggests that the surveyed females moderately accepted their bodies.

Male gym users and non – users evaluated their body as average on the main dimensions of physical attractiveness. They didn't differ in terms of *Physical Attractiveness* ($z = -0.77$, $p = 0.441$), *Upper Body Strength* ($z = -0.82$, $p = .412$) and *Physical Condition* ($z = -0.45$, $p = .651$).

In the group of gym users, both males and females exhibited similar motivations for exercising; those were becoming fitter and improving one's physique, with the least important motivation being training for competitive sports events. However, males used gym workout as supplemental training for other sport disciplines significantly more often than females ($M = 1.93$, $SD = 1.06$ vs. $M = 1.45$, $SD = 0.78$, $d = 0.55$, $p = .01$).

Differences were noted between the sexes as regards the specific aspects of workout. As compared to females, males tended to begin their "journey" with workout earlier in life (Table 1), use the gym for a longer period, and engage in longer workouts (by 20 minutes on average).

Table 1

Sex Differences in Terms of Gym Use

	Women			Men			<i>U</i>	<i>p</i>
	<i>Mdn</i>	<i>M</i>	<i>SD</i>	<i>Mdn</i>	<i>M</i>	<i>SD</i>		
Number of years of using the gym	2.00	2.65	2.44	3.00	3.18	1.92	1448.5	.04
Age of starting training	19.00	19.88	4.45	17.00	18.2	4.60	1281.0	.002
Workout duration (minutes)	75.00	48.19	47.62	90.00	66.83	47.32	3439.0	.007

In the male group, correlation analysis of variables related to emotional well-being (SPANE), body esteem (BES), and gym use revealed no significant relationships with age, education, marital status, or the psychological variables studied (training motivators)

Table 2

Correlations Between Workout Characteristics, Exercise Motivations, and Psychological Variables (Men Group)

Men	Affective balance	Negative experience	Affective balance (SPANE)	Physical Attractiveness	Upper Body Strength	Physical Condition
Workout duration (minutes)	-.01	.03	-.05	.18	.40**	.33*
Motive – Recreation	.41**	.18	.14	.08	.02	.0
Motive – Improving physical condition	.24	.15	.09	.10	.19	.17
Motive – Physique optimization	.20	.21	.04	.03	.27	.23

Continuation of Table 2

Men	Affective balance	Negative experience	Affective balance (SPANE)	Physical Attractiveness	Upper Body Strength	Physical Condition
Motive – Training for strength sports competitions	-.01	.01	-.03	.11	-.01	.05
Motive – Rehabilitation	.07	.06	.03	.30*	.05	-.03
Motive – Complementing training in other sports	-.01	-.02	.01	.29	.06	.17
Affective balance	1.00	-.26*	.77***	.40**	.40**	.40**
Negative experience	-.26*	1.00	-.77***	.05	-.14	-.08
Affective balance	.77***	-.77***	1.00	.27*	.37**	.32*

*** $p < .001$; ** $p < .01$; * $p < .05$

A significant correlation of moderate strength was observed between workout duration and a positive perception of one's strength and physical fitness. Recreational motivation for exercise was moderately correlated with positive emotions, while the need for rehabilitation was moderately correlated with a sense of physical attractiveness. Affective balance and a positive affective balance were positively and significantly correlated with all dimensions of body evaluation: physical condition, upper body strength, and sexual attractiveness.

In the female group, no significant relationship was found between demographic variables (age, education, marital status) and body esteem dimensions or positive and negative experiences. Workout duration was not correlated with the psychological variables studied, either.

However, recreational motivation for exercise was positively correlated with affective balance and the overall affective balance (Table 3, p. 114), while the need to improve one's physical condition was positively correlated with affective balance, positive affective balance, and body esteem across all dimensions: physical condition, weight concern, and sexual attractiveness. A positive relationship was also observed between the individual dimensions of body esteem—i.e., sexual attractiveness, weight concern, and physical condition—and affective balance as well as the overall affective balance.

In the male group, regression of the affective balance variable on gym use and the body esteem variables revealed the following predictors of affective balance (a key indicator of well-being): recreational motivation for exercise ($B = 0.39$, $p = .003$) and a perception of Upper Body Strength ($B = 0.52$, $p < .001$). Those

variables explained almost 40% of the variability in the model ($R^2 = .40$, $SE = 14.42$, $p < .001$).

Table 3

Correlations Between Workout Characteristics, Exercise Motivations, and Psychological Variables (Women Group)

Women	Affective balance	Negative experience	Affective balance	Weight Concern	Physical Condition	Sexual Attractiveness
Workout duration (minutes)	.04	.03	.01	.01	.00	-.02
Motive – Recreation	.27**	.04	.21*	.10	.06	.08
Motive – Improving physical condition	.28**	-.08	.29**	.20*	.22*	.21*
Motive – Physique optimization	.08	.01	.11	.04	.02	.03
Motive – Training for strength sports competitions	-.10	.03	-.11	-.02	-.05	.01
Motive – Rehabilitation	.06	.06	-.01	.00	.01	-.17
Motive – Complementing training in other sports	-.09	.13	-.11	-.02	.03	-.08
Affective balance	1.00	-.21**	.81***	.35***	.43***	.44***
Negative experience	-.21**	1.00	-0.69***	-.03	-.12	.01
Affective balance	.81***	-.69***	1.00	.30***	.41***	.32***

*** $p < .001$; ** $p < .01$; * $p < .05$

In addition, linear regression analysis indicated that in the female group affective balance was predicted by perceived Physical Condition ($B = 0.43$, $p < .001$) and recreational motivation for gym use ($B = 0.25$, $p = .017$). These

variables accounted for almost 26% of the variability in the model ($R^2 = .26$, $SE = 12.93$, $p < .001$).

The predictors of negative experience among females were sexual attractiveness ($B = 0.48$, $p = .003$) and physical condition ($B = -0.33$, $p = .04$), but they explained just over 7% of the variability ($R^2 = .07$, $SE = 4.76$, $p = .011$), which suggests that the degree of negative emotionality was also influenced by some other factors not included in the model.

Discussion

People engage in gym-based physical activity for various reasons that go beyond health concerns, including recreation, appearance, and the pursuit of personal goals. Consistent with previous research, physical activity is generally associated with improved well-being, including higher life satisfaction and better mood regulation (An et al., 20220; Maher et al., 2014; Pengpid & Peltzer, 2019).

The present study showed that positive emotional experiences were related to perceptions of physical fitness and body strength. These effects may reflect both the intrinsic value of exercise and the satisfaction derived from achieving fitness-related goals (Fox, 2000). Interestingly, no significant differences were found between gym users and non-users in terms of affective balance (SPANE) or body esteem. This may indicate that the relationship between physical activity and well-being is more complex and not simply dependent on participation in gym-based exercise (Biddle et al., 2007; Chekroud et al., 2018). Similar findings have been reported in recent studies, suggesting that the effects of physical activity on mental health may vary depending on contextual and psychological factors (Pearce et al., 2022; Singh et al., 2023).

One possible explanation is that individuals outside the gym context may still engage in other forms of physical activity that provide similar psychological benefits (White et al., 2017). The findings also point to the importance of motivational and cognitive factors. In particular, recreational motivation and more positive body-related perceptions were linked to better emotional outcomes, which is consistent with previous research (Ryan & Deci, 2017; Teixeira et al., 2012). This is in line with self-determination theory, which emphasizes the role of intrinsic motivation in promoting psychological well-being (Ryan & Deci, 2000, 2017).

Taken together, this suggests that the benefits of physical activity may depend less on the specific form of exercise and more on the reasons for engaging in it, as well as on how individuals perceive their own bodies. From a practical point of view, promoting physical activity as an enjoyable and self-directed experience may be more beneficial than focusing primarily on appearance-related goals.

The study also revealed a differentiated relationship between body esteem and negative emotions. A stronger focus on appearance, particularly sexual attractiveness, was associated with higher levels of negative emotionality, whereas more positive perceptions of physical fitness were linked to lower levels of negative

emotions. This supports the view that fitness-oriented self-evaluations may play a protective role, while appearance-based concerns may increase vulnerability to psychological distress (Grabe et al., 2008; Tylka & Sabik, 2010). Recent studies also indicate that fitness-related environments may both enhance and undermine body image, depending on underlying motivations and sociocultural influences (Cohen et al., 2020; Homan & Tylka, 2014).

These relationships may be explained by psychological mechanisms such as perceived competence, self-efficacy, and body-related self-evaluations, which play a central role in shaping emotional experiences.

Finally, the results should be interpreted with caution. The relatively homogeneous sample and cross-sectional design limit the generalizability of the findings and do not allow for causal conclusions. Future research could include more diverse samples and longitudinal approaches to better understand the mechanisms linking physical activity, body esteem, and emotional well-being.

Limitations

The study did not control for potential confounding variables such as overall physical activity outside the gym, BMI, or participants' baseline mental health status. These factors may have influenced both body esteem and emotional experiences and should be included in future research.

Declarations

Declaration of conflict of interest

The author declares no potential conflict of interest with respect to the research, authorship, or publication of this article. The author has no significant financial or non-financial interests that would require disclosure, nor any competing interests related to the content of the article. The author also confirms that she is not affiliated with or involved in any organization or entity that could have a financial or non-financial interest in the subject matter or materials discussed in this manuscript.

Entities that contributed to the publication and their contribution

Not applicable

Ethical Approval

Because the study involved a questionnaire survey—which is minimally invasive—it did not require approval from the Ethics Committee; it received faculty approval.

Data Availability Statement

The data may be made available to other researchers upon reasonable request addressed directly to the corresponding author.

Financing statement

Not applicable

Statements and declarations regarding the use of AI

In the process of preparing this article, the author used artificial intelligence-based tools to proofread the text (ChatGPT). The author bears full responsibility for the final content of the manuscript.

Declaration of authors' contributions to the manuscript

Anna Wolpiuk-Ochocińska: Conceptualisation, Data management, Formal analysis, Research, Methodology, Project management, Resources, Supervision, Validation, Visualisation, Writing – first draft, Writing – review and editing.

References

- An, H., Ji, Y., Zhang, D., & Li, Z. (2020). Physical activity and positive mental health in university students: The mediating roles of self-efficacy and stress. *BMC Public Health*, 20, Article 1216. <https://doi.org/10.7717/peerj.17422>
- Aşçi, F. H. (2002). The effects of step dance on physical self-perception of female and male university students. *International Journal of Sport Psychology*, 33(4), 431–442.
- Biddle, S. J. H., & Mutrie, N. (2007). *Psychology of physical activity: Determinants, well-being, and interventions* (2nd ed.). Routledge. <https://doi.org/10.4324/9780203019320>
- Breslin, G., & Leavey, G. (2019). *Mental health and well-being interventions in sport*. Routledge. <https://doi.org/10.4324/9781315147703>
- Chekroud, S. R., Gueorguieva, R., Zheutlin, A. B., Paulus, M., Krumholz, H. M., Krystal, J. & H., Chekroud, A. M. (2018). Association between physical exercise and mental health in 1.2 million individuals in the USA between 2011 and 2015. *The Lancet Psychiatry*, 5(9), 739–746. [https://doi.org/10.1016/S2215-0366\(18\)30227-X](https://doi.org/10.1016/S2215-0366(18)30227-X)
- Chen, K. M., Yang, J., Dong, L., & Xia, Q. B. (2013). Effect of physical exercise on adolescents' psychological stress, coping styles and subjective well-being. *Journal of Chengdu Sport University*, 39(10), 75–79.
- Cohen, R., Newton-John, T., & Slater, A. (2020). The relationship between fitness-related social media use and body image concerns: A meta-analysis. *Body Image*, 35, 54–64. <https://doi.org/10.1016/j.bodyim.2024.101767>
- Contractor, R., & Rasquinha, D. (2023). Exercise behaviour and body esteem of gym-goers in India. *Europe's Journal of Psychology*, 19(1), 1–14. <https://doi.org/10.5964/ejop.3687>
- Craft, L. L., & Landers, D. M. (1998). The effect of exercise on clinical depression and depression resulting from mental illness: A meta-analysis. *Journal of Sport and Exercise Psychology*, 20(4), 339–357. <https://doi.org/10.1123/jsep.20.4.339>

- Dolnicar, S., Grün, B., & Leisch, F. (2011). Quick, simple and reliable: Forced binary survey questions. *International Journal of Market Research*, 53(2), 231–252. <https://doi.org/10.2501/IJMR-53-2-231-252>
- Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P., & Kaiser, S. (2012). Guidelines for choosing between multi-item and single-item scales for construct measurement: A predictive validity perspective. *Journal of the Academy of Marketing Science*, 40(3), 434–449. <https://doi.org/10.1007/s11747-011-0300-3>
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2009). New measures of well-being: Flourishing and positive and negative feelings. *Social Indicators Research*, 39, 247–266. <https://doi.org/10.1007/s11205-009-9493-y>
- Drygas, W., Piotrowicz, R., Jegier, A., & Podolec, P. (2008). Aktywność fizyczna u osób zdrowych. [Physical activity in healthy individuals]. *Forum Profilaktyki*, 3(12), 1–10.
- Fox, K. R. (2000). The effects of exercise on self-perceptions and self-esteem. In S. J. Biddle, K. R. Fox, & S. H. Boutcher (Eds.), *Physical activity and psychological well-being* (pp. 88–117). Routledge.
- Garland, R. (1991). The mid-point on a rating scale: Is it desirable? *Marketing Bulletin*, 2, 66–70.
- Ginis, K. A. M., McEwan, D., Josse, A. R., & Phillips, S. M. (2012). Body image change in obese and overweight women enrolled in a weight-loss intervention: The importance of perceived versus actual physical changes. *Body Image*, 9(3), 311–317. <https://doi.org/10.1016/j.bodyim.2012.04.002>
- Gogol, K., Brunner, M., Goetz, T., Martin, R., Ugen, S., Keller, U., Fischbach, A., & Preckel, F. (2014). “My questionnaire is too long!” The assessments of motivational-affective constructs with three-item and single-item measures. *Contemporary Educational Psychology*, 39(3), 188–205. <https://doi.org/10.1016/j.cedpsych.2014.04.002>
- Górczka, A., & Garczyński, M. (2017). Motywy podejmowania aktywności fizycznej – przegląd literatury [Motives for engaging in physical activity – a literature review]. *Health and Sport*, 7(7), 322–337.
- Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin*, 134(3), 460–476. <https://doi.org/10.1037/0033-2909.134.3.460>
- Grogan, S. (2008). *Body image: Understanding body dissatisfaction in men, women, and children*. Routledge. <https://doi.org/10.4324/9781315681528>
- Halliwel, E. (2013). The impact of thin idealized media images on body satisfaction: Does body appreciation protect women from negative effects? *Body Image*, 10(4), 509–514. <https://doi.org/10.1016/j.bodyim.2013.07.004>
- Hausenblas, H. A., & Fallon, E. A. (2006). Exercise and body image: A meta-analysis. *Psychology & Health*, 21(1), 33–47. <https://doi.org/10.1080/14768320500105270>
- Homan, K. J., & Tylka, T. L. (2014). Appearance-based exercise motivation moderates the relationship between exercise frequency and body image. *Body Image*, 11(2), 101–108. <https://www.sciencedirect.com/science/article/abs/pii/S1740144514000047>
- Johnson, F., & Wardle, J. (2005). Dietary restraint, body dissatisfaction, and psychological distress: A prospective analysis. *Journal of Abnormal Psychology*, 114(1), 119–125. <https://doi.org/10.1037/0021-843X.114.1.119>

- Khaw, K. T., Jakes, R., Bingham, S., Welch, A., Luben, R., Day, N., & Wareham, N. (2006). Work and leisure time physical activity assessed using a simple, pragmatic, validated questionnaire and incident cardiovascular disease and all-cause mortality in men and women: The European prospective investigation into cancer in Norfolk prospective population study. *International Journal of Epidemiology*, 35(4), 1034–1043. <https://doi.org/10.1093/ije/dyl079>
- Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College students' motivation for physical activity: Differentiating men's and women's motives for sport participation and exercise. *Journal of American College Health*, 54(2), 87–94. <https://doi.org/10.3200/JACH.54.2.87-94>
- Krosnick, J. A., & Presser, S. (2010). Question and questionnaire design. In P. V. Marsden, & J. D. Wright (Eds.), *Handbook of survey research* (2nd ed., pp. 263–313). Emerald.
- Lipowska, M., & Lipowski, M. (2013). Polish normalization of the Body Esteem Scale. *Health Psychology Report*, 1(1), 72–81. <https://doi.org/10.5114/hpr.2013.40471>
- Maher, J. P., Doerksen, S. E., Elavsky, S., & Conroy, D. E. (2014). Daily satisfaction with life is regulated by both physical activity and sedentary behavior. *Journal of Sport and Exercise Psychology*, 36(2), 166–178. <https://doi.org/10.1123/jsep.2013-0185>
- Ostrega, W. (2017). *Aktywność fizyczna jako kluczowy element zdrowego stylu życia*. [Physical activity as a key element of a healthy lifestyle]. Instytut Matki i Dziecka.
- Pearce, M., Garcia, L., Abbas, A., Strain, T., Schuch, F. B., Golubic, R., Kelly, P., Khan, S., Utukuri, M., Laird, Y., Mok, A., Smith, A. D., Tainio, M., & Brage, S. (2022). Association between physical activity and risk of depression: A systematic review and meta-analysis. *JAMA Psychiatry*, 79(6), 550–559. <https://doi.org/10.1001/jamapsychiatry.2022.0609>
- Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, 18(2), 189–193. <https://doi.org/10.1097/00001504-200503000-00013>
- Pengpid, S., & Peltzer, K. (2019). Leisure-time physical inactivity and sedentary behavior and lifestyle correlates among students aged 13-15 in the Association of Southeast Asian Nations (ASEAN) member states, 2007-2013. *International Journal of Environmental Research and Public Health*, 16(7), Article 1192. <https://doi.org/10.3390/ijerph13020217>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
- Singh, B., Olds, T., Curtis, R., Dumuid, D., Virgara, R., Watson, A., Szeto, K., O'Connor, E., Ferguson, T., & Eglitis, E. (2023). Effectiveness of physical activity interventions for improving depression, anxiety and distress: An overview of systematic reviews. *British Journal of Sports Medicine*, 57(18), 1203–1209. <https://doi.org/10.1136/bjsports-2022-106195>
- Teixeira, P. J., Carraça, E. V., Markland, D., Silva, M. N., & Ryan, R. M. (2012). Exercise, physical activity, and self-determination theory: A systematic review. *International*

- Journal of Behavioral Nutrition and Physical Activity*, 9, Article 78. <https://doi.org/10.1186/1479-5868-9-78>
- Tylka, T. L., & Sabik, N. J. (2010). Integrating social comparison theory and self-esteem within objectification theory to predict women's disordered eating. *Sex Roles*, 63(1–2), 18–31. <https://doi.org/10.1007/s11199-010-9785-3>
- van Woudenberg, T. J., Bevelander, K. E., Burk, W. J., & Buijzen, M. (2020). The reciprocal effects of physical activity and happiness in adolescents. *International Journal of Behavioral Nutrition and Physical Activity*, 17, Article 147. <https://doi.org/10.1186/s12966-020-01058-8>
- White, R. L., Babic, M. J., Parker, P. D., Lubans, D. R., Astell-Burt, T., & Lonsdale, C. (2017). Domain-specific physical activity and mental health: A meta-analysis. *American Journal of Preventive Medicine*, 52(5), 653–666. <https://doi.org/10.1016/j.amepre.2016.12.008>