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Health Education as a Tool for Shaping Adolescents' Organizational Behavior: Contribution to Achieving SDG3

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Abstract:

Purpose: *This study aimed to identify, analyse and diagnose the impact of school health education (HE) on lifestyle choices and well-being among adolescents in Poland. The need for research arose from the necessity of managing preventive health measures for young people through planning, coordination, and monitoring.*
Methodology: *A survey of 582 students aged 14–19 examined the effects of HE on diet, activity, safety, self-satisfaction, and emotional health, using statistical analyses to link school HE management with health behaviours.*
Findings: *Students exposed to HE showed healthier habits, greater satisfaction, and stronger safety perceptions. Effective HE management reinforced health-oriented behaviours but had a limited impact on fast-food intake and peer relations.*
Practical implication: *Results stress the importance of strategic HE management for integrating prevention into curricula, teacher training, and school policy.*
Originality/value: *The study highlights HE as a managerial process generating long-term social and economic gains through better prevention and more substantial human capital.*

Keywords: *Health education, adolescent behavior, organizational behavior, sustainable development goals (SDG3), preventive health practices.*

JEL classification: *I12, I18, I25, D23, O15.*

Paper type: *Research paper.*

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1. Introduction

Managing youth health prevention interventions requires, among other things, increasing their effectiveness. Young people face many issues that directly impact their health (Institute for Integrated Prevention, 2018). In studies commissioned by the Polish Ombudsman for Children, a significant decline has been observed across successive stages of education in the perceived quality of life among children and adolescents, accompanied by a decrease in physical activity levels and a reduction in self-reported health status (Biuro Rzecznika Praw Dziecka, 2023).

Regarding that, health education (HE) should be recognised as a public health initiative and a long-term economic and financial strategy. Empirical research consistently shows that early prevention and health promotion efforts reduce the burden of non-communicable diseases, lower future healthcare costs, and increase economic productivity.

The study aims to investigate the relationship between health education knowledge provided in upper secondary schools and students' lifestyle choices. We formulated the following research hypotheses:

- Students who report having acquired health education knowledge at school evaluate their health-related behaviour in the past school year positively;
- Students who report having acquired health education knowledge at school assess their health and well-being at school positively;
- Students who report having acquired health education knowledge at school demonstrate a positive self-assessment regarding their healthy lifestyle.

The study investigates the link between health education knowledge and key aspects of adolescent lifestyles, including dietary habits, physical activity, self-perception, and psychological well-being.

2. Literature Review

The influence of school-based health education on adolescent lifestyles has been identified in the literature as a key factor in fostering long-term health behaviours. Previous studies indicate that structured health education programs effectively enhance adolescents' awareness, attitudes, and daily practices concerning physical activity, nutrition, mental health, and risk prevention.

HE in schools aims to develop healthy habits that young people can carry into adulthood. It raises students' awareness of healthy lifestyles and helps dispel myths associated with them, such as unhealthy diets (Jeruszka-Bielak and Kołłajtis-Dołowy, 2015), orthorexia, or dangerous practices. It can also encourage forming peer support

groups (Maszorek-Szymala, 2017), positively impacting motivation to lead a healthy lifestyle.

Comprehensive HE programs significantly contribute to increased physical activity, which is essential for physical and mental well-being. Donnelly *et al.* (2016) demonstrate that health education, especially integrated with physical education, improves fitness levels, cognitive function, and academic performance. Research by Tanveer *et al.* (2025) and Mölenberg *et al.* (2025) demonstrates that structured HE programs effectively reduce BMI and sedentary behaviour while increasing daily physical activity.

Nutritional behaviours are another key area shaped by HE. Jeruszka-Bielak and Kołłajtis-Dołowy (2015) emphasise that effective dissemination of nutritional knowledge in schools leads to healthier dietary choices, including reduced consumption of processed foods and increased intake of fruits and vegetables. Mozaffarian *et al.* (2011) link early nutritional education to long-term weight management and prevention of lifestyle-related diseases. Wadolowska *et al.* (2019) show that school-based nutrition education reduces unhealthy dietary habits and central adiposity among pre-teens.

Wang and Stewart (2013), Egg *et al.* (2020), further confirm improvements in nutritional patterns through structured school interventions. Acito *et al.* (2024) emphasise primary schools' critical role as health promotion settings. Their survey reveals gaps in active health-related projects and highlights the potential for schools to influence children's dietary and lifestyle habits through structured interventions involving teachers and students.

Mental health promotion through school-based HE has also gained significant attention. Dale, Brassington, and King (2014) find that programs addressing stress management, emotional resilience, and positive self-image significantly reduce the risk of anxiety and depression among adolescents. Czarnecki *et al.* (2023), Wieteska (2017), point to the importance of physical activity and broadly understood care for physical health as a preventive factor in relation to mental health.

Innovative strategies have enhanced the effectiveness of health education. Tollefson et al. (2019) called to integrate lifestyle medicine education into secondary schools, highlighting the importance of early exposure to structured health information. Pilot programs revealed increased awareness of how lifestyle impacts long-term health, with adolescents showing increased engagement in physical activity and healthier eating patterns.

3. Materials and Methods

The primary objective of this study is to investigate the relationship between the health education (HE) knowledge provided in upper secondary schools and students'

lifestyle choices. The research was conducted using a quantitative approach with a diagnostic survey method. Data were collected between March and September 2023 from 582 secondary school students aged 14-19. The survey was anonymous, and participation was voluntary.

The questionnaire consisted of 45 closed-ended questions focusing on four key areas related to health education and students' well-being:

- Perceived importance of health in school (21 questions);
- Health-related behaviour in the past school year (8 questions);
- Perceived health and well-being at school (3 questions);
- Self-assessment regarding a healthy lifestyle (12 questions).

The research group comprised 582 participants, among whom 359 students declared they had received health education at their school. This HE-exposed group consisted of 158 females (45%) and 201 males (56%), most of whom were aged 18-19 (44%) and lived in urban areas (93%). Explanatory variables were selected based on factors influencing lifestyle and health status.

The primary explanatory (grouping) variable was exposure to school-based health education:

- Group 1 (HE group): students who declared receiving health education as part of their schooling;
- Group 2 (comparison group): students who, according to the school regulations, should have received health-related knowledge during physical education or homeroom classes, but did not.

The outcome variables were the four domains listed above (perceived importance of health, recent health behaviours, perceived health and well-being at school, and self-assessed healthy lifestyle). Statistical analyses employed both descriptive and inferential statistics. Differences between categorical variables across groups were tested using the Chi-square test (χ^2).

To evaluate the strength of observed effects, we reported effect sizes alongside significance:

- φ (phi) coefficient for 2×2 contingency tables: small ≈ 0.10, medium ≈ 0.30, strong ≈ 0.50 (King & Minium, 2020).
- Cramér's V for larger contingency tables: ≥ 0.07 (small), ≥ 0.21 (medium), ≥ 0.35 (large).

When interpreting findings, we considered results acceptable in two situations, following Sun *et al.* (2010):

1. statistical significance and a strong effect size are both present; or
2. statistical significance is absent but the effect size is strong (indicating practical relevance).

The significance level was set at $p < 0.05$. Where appropriate, φ (2×2) and Cramér's V (larger tables) are reported to complement χ^2 and provide a fuller picture of effect magnitude (Coe, 2002; Sullivan and Feinn, 2012).

4. Results and Discussion

In the first stage of the study, students assessed access to health education (Table 2). We can confirm a statistically significant difference between female and male students regarding their access to health education ($p = 0.0003$). The effect size was moderate ($\varphi = 0.152$), suggesting a meaningful difference between genders. The most significant difference is observed when analysing a class profile. The academic profile shows a highly significant effect ($p = 0.0000$) with a large effect size (Cramér's $V = 0.406$), indicating that perception of access to health education is strongly associated with the class profile (e.g., students in biology-chemistry classes reported more exposure).

A small but statistically significant effect was observed in the age group 14–15 ($p = 0.03444$; $\varphi = 0.108$). However, for the other age groups, no substantial differences are detected. Additionally, there is no statistically significant difference between students from urban and rural areas ($p = 0.82043$). The effect size was negligible and classified as unacceptable ($\varphi = -0.0094$), suggesting that a place of residence does not differentiate the access to school-based health education.

Table 2. *Access to health education by gender, age, study profile and place of residence*

Category	Total N(%)	Yes N(%)	No N(%)	p-value	Effect Size (φ, Cramér's V)	Contingency Coefficient
Sex						
Female	291 (50%)	158 (45%)	133 (60%)	0.0003	0.152 (moderate)	0.1502
Male	291 (50%)	201 (56%)	90 (40%)			
Age						
14–15	238 (41%)	135 (38%)	103 (46%)	0.03444	0.108 (small)	0.107
16–17	108 (19%)	77 (21%)	31 (14%)			
18–19	236 (41%)	147 (41%)	89 (40%)			
Class profile						
Biol-Chem	153 (26%)	46 (13%)	108 (48%)	0.0000	0.406 (large)	0.376

Math-Phys	193 (33%)	136 (38%)	56 (25%)			
Math-Geo	153 (26%)	108 (30%)	45 (20%)			
the remaining	83 (14%)	69 (19%)	14 (6%)			
Place of residence						
Urban	542 (93%)	335 (93%)	207 (93%)	0.82043	-0.0094 (unacceptable effect)	0.009
Rural	40 (7%)	24 (7%)	16 (7%)			

Source: *Own study.*

The results also indicate that access to school-based health education affects selected elements of students' lifestyles (Table 3):

- Students receiving HE are more likely to adopt healthier eating habits, such as regular meals, increased water intake, and limiting processed foods. The moderate effect confirms a meaningful behavioural difference (p = 0.000; moderate effect (0.300)),
- They tend to limit time on computers, smartphones, or watching TV (p = 0.000; large effect (0.426),
- Students who receive HE more often report making time for relaxation and hobbies, showing that HE may positively affect time management and mental balance (p = 0.000; moderate effect (0.298)),
- There is a statistically significant yet small effect, indicating that HE contributes to improved hygiene practices (e.g., brushing teeth, washing hands), though the impact is limited (p = 0.000; small effect (0.195)),
- Students with access to HE are more likely to seek help when facing problems, indicating a higher level of emotional intelligence and willingness to access social support (p = 0.000; Large effect (0.573)),
- HE appears to have a powerful influence on students' body image and self-satisfaction—critical aspects of adolescent mental health (p = 0.000; Large effect (0.721)), and also contributes to students' positive self-image and confidence (p = 0.000; large effect (0.559)).

Table 3. *Characteristics of health-related behaviours during the past school year among participants by health education knowledge*

Questions	Health Education (HE) at school			p-value	Effect Size (φ, Cramér's V)	Contingency Coefficient
	Total N(%)	Yes N(%)	No N(%)			
I try to be more physically active (e.g., walk more, run, ride a bike, exercise, dance, swim, play sports)						
Yes	427(73)	347(97)	80(36)	0.000	0.669 unacceptable effect	0.556
Rather yes	155(27)	12 (3)	143 (64)			
Rather no	0	0	0			

No	0	0	0			
I pay more attention to how I eat (e.g., I eat breakfast every day, consume fruits and vegetables, drink more water, and limit sweets, chips, and fast food)						
Yes	158(27)	91 (25)	67 (30)	0.000	0.300 moderate	0.286
Rather yes	351(60)	195(54)	156(70)			
Rather no	0(0)	0	0			
No	73(13)	73 (21)	0			
I limit the time I spend on the computer, smartphone, or watching television						
Yes	235(40)	92 (26)	143 (64)	0.000	0.426 large	0.392
Rather yes	0	0	0			
Rather no	274 (47)	193(54)	80 (36)			
No	73 (13)	73(20)	0			
I take better care of my hygiene (e.g., I brush my teeth at least twice a day and wash my hands frequently)						
Yes	354 (61)	209 (58)	145 (65)	0.000	0.195 small	0.192
Rather yes	77 (13)	66(18)	11(5)			
Rather no	0	0	0			
No	0	0	0			
I don't know	151 (26)	84 (23)	67 (30)			
I try to find time during the day to rest and engage in enjoyable activities (e.g., play, hobbies)						
Yes	509 (87)	286 (80)	223(100)	0.000	0.298 moderate	0.286
Rather yes	73 (13)	73 (20)	0			
Rather no	0	0	0			
No	0	0	0			
I try to think positively about myself (recognize my strengths and successes)						
Yes	158 (27)	80 (22)	0	0.000	0.559 large	0.488
Rather yes	119 (20)	140 (39)	212 (95)			
Rather no	232 (40)	139 (39)	11(5)			
No	73 (13)	0	0			
I ask someone for help when I have a problem						
Yes	158 (27)	91 (25)	67 (30)	0.000	0.573 large	0.497
Rather yes	119 (20)	117(33)	2 (1)			
Rather no	232 (40)	78 (22)	154 (69)			
No	73 (13)	73 (20)	0			
I feel good in my body. I am satisfied with myself						
Yes	80 (14)	80 (33)	0	0.000	0.721 large	0,585
Rather yes	197 (34)	12 (5)	69 (31)			
Rather no	155 (27)	12 (5)	143 (64)			
No	0	0	0			
I don't know	150 (26)	139 (57)	11(5)			
*Fi for tables 2 x 2						

Source: *Own study.*

The results presented in Table 4 demonstrate that students who reported acquiring knowledge from health education (HE) programs at school show significantly better outcomes in terms of their health-related well-being at school:

- Students who received health education are much more likely to report feeling good at school than those who did not (p-value is 0.000, indicating a statistically significant difference between students with and without HE knowledge. The effect size is 0.4835, classified as large, and the contingency coefficient is 0.4353),
- Students with health education knowledge more frequently express enjoyment of their school experience (p-value is also 0.000, with an effect size of 0.4903, again classified as large, and a contingency coefficient of 0.4402),
- Students who received health education feel significantly safer than their peers who did not participate in such programs (p-value is 0.000, the effect size is 0.685, and the contingency coefficient is 0.564).

Table 4. *Characteristics of health well-being at school, depending on HE knowledge from health education at school*

Questions	HE at school				*p-value*	Effect Size (φ, Cramér's V)	Contingency factor
	Total, N(%)	Yes, N(%)	No, N (%)				
I usually feel good at school							
Yes	235 (40)	92 (26)	143 (64)		0.000	0.4835, large	0.4353
Rather yes	196 (34)	183 (51)	13 (6)				
Rather no	0	0	0				
No	0	0	0				
Don't know	151(26)	84(23)	67(30)				
I like being at school							
Yes	354 (61)	209 (58)	145 (65)		0.000	0.4903, large	0.4402
Rather yes	78 (13)	11 (3)	67 (30)				
Rather no	0	0	0				
No	77 (13)	66 (18)	11 (5)				
Don't know	73(13)	73(20)	0				
I feel safe at school							
Yes	155 (27)	12 (3)	143 (64)		0.000	0.685, large	0.564
Rather yes	277 (48)	208 (58)	69 (31)				
Rather no	0	0	0				
No	0	0	0				
Don't know	150 (26)	139 (39)	11 (5)				

Source: *Own study.*

Students who reported acquiring HE knowledge were significantly more likely to engage in positive dietary behaviours (Table 5). Specifically, regular breakfast consumption was strongly associated with health education (p = 0.000), with a large effect size (d = 0.391) and a substantial contingency factor (0.365).

Similarly, regular meal consumption demonstrated a statistically significant relationship (p = 0.000), although the effect size was moderate (d = 0.315), suggesting a moderate practical influence of HE on maintaining regular eating habits. A significant association was found regarding fast-food consumption (p = 0.000). However, the effect size (d = 0.638) was unacceptable, indicating that although statistically significant, the relationship may lack practical relevance.

No significant effect was observed regarding the consumption of sweets, suggesting that health education may not sufficiently influence students' habits related to sweet food intake. The intake of fruits and vegetables showed a positive, moderate association with HE knowledge (p = 0.000, d = 0.260, contingency factor = 0.252).

Students exposed to health education were more likely to consume fruits and vegetables regularly than their peers. Finally, students' overall self-perception of leading a healthy lifestyle was moderately associated with HE knowledge (p = 0.000, d = 0.260). Those with health education experience were more likely to assess their lifestyle as healthy.

Table 5. *Characteristics of self-assessment in the field of healthy lifestyle of participants depending on (HE) knowledge of health education at school*

Questions	HE at school			p-value	Effect size (φ, Cramér's V)	Contingency factor
	Total, N(%)	Yes, N(%)	No, N (%)			
Do you eat your breakfast						
Yes	425(73)	213(59)	212(95)	0.000	0.391, large	0.365
No	157(27)	146(41)	11(5)			
Do you regularly eat meals						
Yes	502 (86)	279 (78)	223 (100)	0.000	0.315, moderate	0.300
No	80 (14)	80 (22)	0			
Do you eat in fast-food restaurants						
Yes	269 (46)	256 (71)	13 (6)	0.000	0.638, unacceptable	0.5381
No	313(54)	103 (29)	210 (94)			
Do you eat sweets						
Yes	582 (100)	359(100)	223(100)	no effect		
No	0	0	0			
Do you eat a lot of vegetables and fruits						
Yes	436 (75)	237 (66)	199 (89)	0.000	0.260, moderate	0.252
No	146 (25)	122 (34)	24 (11)			
Do you meet peers outside of school						

Yes	582 (100)	359 (100)	223 (100)	no effect		
No	0	0	0			
Do you think you are living a healthy lifestyle						
Yes	436	237	199	0.000	0.260, moderate	0.252
No	146	122	24			

Source: *Own study.*

The results of the study confirm that school-based health education (HE) positively influences adolescents' lifestyle-related behaviours. Students who reported receiving HE showed better self-perceived health, a greater sense of security at school, and healthier eating habits than those without such education.

The significant improvement in students' well-being and perceived safety aligns with the findings of Dale, Brassington, and King (2014), who demonstrate that school health promotion programs reduce anxiety and foster emotional resilience among adolescents. Similarly, Pascoe *et al.* (2020) confirm that integrating physical activity into school programs improves mental health outcomes, supporting the relationship between HE and students' satisfaction and emotional comfort at school.

The study also reveals that students exposed to HE more frequently consumed breakfast, ate meals regularly, and consumed fruits and vegetables, confirming trends observed by Jeruszka-Bielak and Kołłajtis-Dołowy (2015). Their study emphasises that nutritional knowledge provided at school significantly promotes healthier eating habits. Additionally, these results are consistent with Wang and Stewart (2013), who show that the Health Promoting Schools (HPS) framework effectively increases healthy food consumption while reducing intake of unhealthy products.

However, it should be noted that the impact of HE on reducing the consumption of fast food and sweets was less pronounced. These findings correspond with challenges highlighted by Aas, Iversen, and Hoff (2017), who stress that while HE can positively influence health behaviours, its effectiveness depends heavily on the relevance and attractiveness of the content delivered to adolescents.

Moreover, no significant relationship exists between HE and adolescents' social behaviours, such as meeting peers outside of school. This result contrasts with the assumptions of Maszorek-Szymala (2017) and Ifroh *et al.* (2024), who indicate that peer interactions within a health-promoting environment are crucial for sustaining healthy behaviours.

It may suggest that while HE improves individual health awareness, it may require broader systemic strategies involving peer and family engagement to influence social habits. Finally, the findings support previous research advocating for comprehensive, multi-faceted health education approaches embedded within the whole-school system, as Langford *et al.* (2015) and Bonell *et al.* (2022) emphasised.

5. Conclusions

In Polish secondary schools, health education (HE) plays a critical role in shaping adolescents' health-related behaviours and well-being. The study confirms that students who reported receiving HE show significantly better outcomes in dietary habits, emotional well-being, and healthy lifestyle self-assessment than those without structured HE exposure. The findings demonstrate that HE positively influences students' mental health, body image, sense of security at school, and promotes the adoption of health-promoting behaviours, such as balanced nutrition and regular physical activity.

Despite its effectiveness, the study also highlights certain limitations of current HE practices, notably the limited influence on reducing unhealthy dietary habits, such as fast-food or sweet consumption. This indicates the necessity of tailoring educational interventions to better engage adolescents and address barriers to behaviour change.

Furthermore, the lack of observed effect on social engagement patterns suggests that broader systemic approaches, incorporating peer and family dynamics, may be needed to amplify health education's impact on adolescents' social health behaviours.

By shaping healthier lifestyle behaviours early, HE reduces long-term public healthcare expenditures, increases educational attainment, and enhances labour market outcomes.

These individual-level benefits accumulate into macroeconomic advantages, improved workforce productivity, reduced absenteeism, and lower incidence of chronic diseases, as well as the resilience of national economies and the realisation of the Sustainable Development Goals.

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