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Stress coping strategies of teenagers who engage in various types of physical activity

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Dictionary:

"How do you cope?" scale (HDC) – is used to study the ways of coping with a difficult situation by children and adolescents aged 11-17. It consists of two parts designed to measure dispositional and situational ways of coping with stress. In both parts, three types of strategies were distinguished: active coping, focusing on emotions and seeking support [6].

Coping with stress – is a conscious volitional effort to regulate emotions cognition, behavior, psychological processes, and the environment in response to a stressful event or circumstance. This definition emphasizes that coping is an active and intentional process, distinguishing it from subconscious "defence mechanism" [31].

Abstract:

Background and Study Aim: The global COVID-19 pandemic has had adverse effects on the mental and physical well-being of individuals worldwide, particularly children and teenagers. Experiencing anxiety by children and adolescents who are exposed to multiple long-term stressors during developmentally sensitive periods poses a serious threat to their health. The impact of physical activity on physical, mental and social health has been confirmed in scientific research. These dimensions are interrelated, and changes in one element affect the others. This study aims to identify the preferred stress coping strategies used by adolescents engaging in various forms of physical activity, in the context of promoting a healthy lifestyle.

Material and Methods: The study involved 462 adolescents, aged 14-17 (mean age 15.2 ±1.1 years). Respondents regularly practiced various individual sports (IS), including combat sports (CS), team sports (TS), physical recreation (PR), and exercising occasionally (PP). A standardized questionnaire "How do you cope?" (HDC) and an original survey questionnaire were used. Non-parametric statistics were applied.

Results: Teenagers most often experienced problems related to maintaining relationships with peers (59.5%), mental health (32%,) physical health (11%), and insufficient contact with teachers (39%). Adolescents used similar ways of coping with difficult situations in both strategies: dispositional (standard situation) and situational (problems indicated by the teenagers) (r_s = 0.501). In the dispositional strategy, active coping with stress ($p<0.01$) and seeking social support ($p<0.05$) were more frequently used by teenagers practicing individual sports compared to those engaged in team sports. In both strategies (dispositional and situational), a lower intensity of emotion focused coping was observed among adolescents participating in team sports (TS) compared to the remaining respondents (CS, IS, PR, PP), $p<0.001$.

Conclusions: The problems indicated by teenagers prompt the search for solutions that could, strengthen social bonds, teach stress management skills, and recreate situations that foster the fulfilment of teenagers' developmental needs. Raising awareness among physical education teachers, instructors, sports coaches, and parents about the ways in which young people can address their perceived problems may help reduce stress. Mandatory health education and the promotion of physical activity should serve as effective means of supporting teenagers in coping with stress.

Keywords: combat sports, individual sports, physical recreation, questionnaire HDC, team sports

Dispositional coping with stress – determines permanent tendencies to choose specific behaviors. The respondents answers the questions in the context of a standard difficult situation described in the questionnaire, on a scale from – 0 – almost never, to 4 – almost always. The assessment of dispositional coping takes into account the frequency of using a particular way of behaving [1].

Situational coping with stress – concerns a difficult situation experienced in the past year. The situational assessment indicates the degree of severity of a given behavior, more dependent on the current characteristic of the stressful event (scale from 0 – definitely not, to 4 – definitely yes) [1].

Biserial correlation – measures the association between a continuous variable and a naturally or artificially dichotomous (two-category) variable, differing from **point-biserial correlation**, which is used when the dichotomous variable is truly discrete (like sex). While point-biserial is Pearson's r for these variables, the true biserial correlation estimates the correlation between the *underlying continuous latent variable* and the other continuous variable, useful when the binary variable is an *artificially* divided continuous one (e.g., high/low test scores). Both coefficients range from −1 (perfect negative) to +1 (perfect positive), with 0 meaning no correlation, and are vital for understanding relationships where one factor has only two levels.

1. Introduction

The COVID-19 pandemic has dramatically changed the everyday life and has had a significant impact on the mental health and well-being of society. Due to the pandemic, teenagers coming from different countries have experienced increased anxiety, depression and stress [1]. Changes in everyday behaviour negatively affected the mental health of adolescents [2], including those practicing sports [3]. The anti-health effects of teenagers' physical passivity are indicated in many studies [4]. Most of them showed a deterioration in mental health from pre-pandemic to post-pandemic period, including an increase in depression symptoms and experienced stress [5].

Methods for managing stress are regarded as factors influencing both present and future adjustment [6]. Prolonged investigations have indicated that challenges adolescents face in resolving conflicts, addressing peer aggression, and managing hostility in romantic relationships during late adolescence can forecast immune system dysfunction (elevated interleukin-6 IL-6 levels) in adulthood [7]. The significance of peer relationships during adolescence and their substantial influence on overall human well-being [8], extending into adulthood [9, 10], is emphasized in numerous studies. Difficulties in effectively managing challenging situations were particularly evident among individuals struggling with familial issues. Insufficient familial support resulted in feeling of isolation, strained peer relationships, academic challenges, and heightened stress levels. Among students endeavouring to alter distressing circumstances, a predominant focus on emotional coping mechanisms was observed. Adolescents encountering stress related to schooling, when compared to those contending with family problems, exhibited a higher tendency to engage in alternative behaviours such as excessive internet use or overeating. While these behaviours might offer temporary relief, repeated indulgence could potentially lead to a loss of control over the situation [11]. In the context of academic stress, assuming responsibility for the situation appeared more manageable, whereas addressing family-related issues posed greater complexities [12]. Factors that serve as safeguards against stress encompass social support, effective coping strategies, and healthy parent-child relationships [1].

Pre-pandemic research indicates that among the majority of middle school students, the most effective stress relief method was listening to music. Additionally, boys frequently opted for physical activities, internet browsing, and computer games, while girls tended to choose walking or reading books as their coping strategies [13]. Notably, more physically active adolescents tended to employ active coping mechanisms, approaching difficult situations as challenges to solve. Conversely, individuals with lower levels of physical activity often leaned towards an emotional coping style and demonstrated a propensity to seek social companionship [14]. Furthermore, disparities between student athletes and their non-training counterparts were also substantiated. Athletes rated their ability to manage challenging situations higher [15]. A study involving Korean teenagers revealed that 78.9% of the students experienced stress. Notably, students engaging in physical activity more than five times per week exhibited a lower likelihood of experiencing stress compared to their physically inactive peers [16]. In solving situational problems, focusing on emotions and seeking social support, characterized students as physically passive. Students training 30 to 60 minutes daily were more likely to actively cope with stress compared to those physically passive ones [17]. A high level

of physical activity and regular exercise have a safeguarding effect against depression [18].

Regrettably, a majority of investigations have reported a notable decline in physical activity and reduced engagement in sports during the pandemic, in comparison to the pre-pandemic period [19-21]. It was observed that in the group that had met the WHO's recommendations before the lockdown, 50% of active adolescents in the pre-pandemic time significantly decreased their level of MVPA (moderate to vigorous intensity physical activity) below the WHO's recommendations [22]. Furthermore, a noteworthy shift in the nature of this activity was noted. Despite the constancy in overall physical activity time (measured in minutes per week), there was a surge in outdoor play while organized physical activity participation experienced a decline [23]. The imposition of Covid-19 preventive strategies, particularly the closure of schools which served as hubs for physical activity opportunities (participation in physical education classes, sporting activities, and active commuting to and from school), contributed significantly to the curtailment of physical activity [24, 25]. Research conducted in Germany during the pandemic illuminated a staggering reduction of over 40% in physical activity levels, coupled with an increase in the time spent in front of the computer during the pandemic [20].

The constraints, directives, and prohibitions associated with COVID-19 [26], along with subsequent amendments prompted by the epidemic outbreak [27], unequivocally influenced the nature, modalities, and intensity of physical activity among teenagers. Over the past few years, the challenges posed to engaging in sports and participating in physical activities in various settings, coupled with limitations on gatherings and communal events, have invariably reshaped the avenues through which children and adolescents can pursue these interests. The current situation necessitates changes in the physical education system, where learning various forms of activity will be directed toward leading a health-promoting lifestyle among young people [28]. Promoting values that support health and Olympic values is essential in the process of sports education, including combat sports and hand-to-hand combat activity [29-36].

Considering the perspective of social well-being, conducting research on coping strategies amidst challenging circumstances [37], shortly after the pandemic, holds considerable significance. The present context, despite being inherent societal health risks, has presented unparalleled opportunities to investigate adolescents who, for approximately two years with intermittent interruptions, have been predominantly engaged in remote activities. Delving into patterns of health-related behaviours, recreational preferences, levels of physical activity, and preferred stress management techniques can yield invaluable insights into the efficacy of preventive measures.

This study aims to identify the preferred stress coping strategies used by adolescents engaging in various forms of physical activity, in the context of promoting a healthy lifestyle.

A hypothesis has been postulated: The diversity in physical activity among teenagers (engaged in distinct individual sports, combat sports, team sports, recreational physical activities, occasional physical activity) is associated with both dispositional and situational stress coping strategies.

2. Material and Methods

Study participants and ethical considerations

The study was conducted during the 2022/2023 school year in the West Pomeranian Voivodeship. A total of 462 respondents were involved in the research, comprising 210 girls/women and 252 boys/men, within an age range of 14 to 17 (mean age of 15.2 ±1.1 years). The participants represented various educational backgrounds, including primary schools (18.2%), level 1 vocational schools (8.9%), secondary vocational schools (44.1%) and comprehensive secondary schools (28.8%). The majority of respondents resided in urban areas accounting for 67.3% of the total sample. A significant portion of the participants, accounting for 85.6%, rated their financial circumstances as abundant, very favourable, or satisfactory. Approximately 6% perceived their financial situation as adequate or less favourable, while the remaining respondents refrained from providing an evaluation. In terms of physical activity patterns, the respondents demonstrated diverse engagement: 88.1% of teenagers declared involvement in individual sports, team sports, physical recreational activities, and participation in physical education classes. On the other hand, 11.9% of respondents did not engage in regular physical activity. This group included individuals who reported occasional participation in physical exercise (less than once a week) and those who had full or partial exemption from physical education classes. In the past, a notable 2.6% of the respondents achieved achievements at the level of the Polish championship.

Among the respondents, there was identified a subgroup engaged in individual sports (IS): athletics, archery, badminton, bodybuilding, horseback riding, pole dance, rhythmic gymnastics, sailing, swimming, squash, table tennis, tennis, weightlifting, etc. (38.7%). Individuals exclusively involved in combat sports (CS): aikido, boxing, Brazilian ju-jitsu, kick-boxing, taekwondo, Thai boxing (8.1%), were segregated from the individual sports group, due to the uniqueness of these disciplines in the versatile shaping of the human personality [28, 29, 35]. Participants in physical recreation (PR): aerobics, cycling, dancing, fitness, gymnastics, walking, yoga (accounted for 21.4% of the respondents). People practicing team sports (TS): basketball, football, handball, volleyball (constituted 19.9%). Irregular physical activity was reported by 11.9% of respondents. Detailed characteristics of the study population sample are presented in Table 1 in the 'Results' section.

Informed consent was obtained from all individual participants in the study. Written informed consent was obtained from parents/guardians. The study methodology was approved by the Ethical Committee for Research Projects at the Institute of Psychology, University of Szczecin in Szczecin (KB 27/2021). Students, parents/legal guardians, and teachers were informed of the objectives and assured anonymity. The consent rate was over 80% (some parents did not attend the meeting organised by the class teacher). Students were informed of their right to withdraw from the study at any time, without consequences, in accordance with the principles set forth in the 1975 Declaration of Helsinki.

Study design, methods and tools

A diagnostic survey method was employed utilizing the standardized questionnaire titled "How do you cope?" (HDC) [6], which serves to gauge both dispositional (standard difficult situation) and situational (self-described difficult situation experienced within the preceding year) coping strategies in response to stress. The questionnaire consisted of two sections, each comprising 9 statements formulated in the present tense in reference to a specific scenario and in the past tense in relation to a challenging situation described by the respondent, experienced during the past year. Respondents provided their answers on a five-point scale, allocating points ranging from 0 to 4. This tool facilitates the evaluation of three coping strategies employed during challenging situations: *active coping*; *emotional focus*, and *seeking social support*. The assessment of dispositional coping takes into account the frequency of utilizing a specific behavioural approach, while the situational assessment, as described by the individual who experienced the event, provides insight into the extent of severity of the particular behaviour.

In order to augment the research, the author's questionnaire included personal information and details regarding the physical activity levels of the teenagers being studied.

Statistical analysis

In our study, the internal consistency of the dispositional version was measured using Cronbach's α coefficient, yielding a value of 0.84, and for the situational version, it was 0.82. For the active coping, focusing on emotions, and seeking social support strategies, the dispositional version yielded coefficients of 0.73, 0.83, and 0.67 respectively, while the situational version displayed values of 0.75, 0.80, and 0.74, respectively.

Nonparametric statistics were applied in the analyses of the results (distribution that differs from normal). The Kruskal-Wallis test (H-test) was used to compare several independent samples. In the case of determining statistical significance of differences for the comparison of two independent samples, the Mann-Whitney (*U*) test was employed. The trait frequency and the independence chi-square test were used. The effect size was calculated for each test: ε^2 for the Kruskal-Wallis H-test, Glass rank biserial correlation (indicator: *rg* and definition see 'Dictionary') for the Mann-Whitney *U* test, Cramér's V (*CV*) for the χ^2 test.

Correlations were used for dispositional and situational coping strategies by the subjects (Spearman's rho, indicator: r_s). The value of $p<0.05$ was assumed to be statistically significant. Static trend (values $0.05<p$) is also shown. Statistical calculations were made with Statistica 13.1 for Windows (StatSoft Sp. z o.o., Crakow, Poland), Microsoft Office Excel 2007 (Microsoft Sp. z o.o., Warsaw, Poland) and JASP 0.8.1.2 (https://jasp-stats.org) (accessed January 2025).

3. Results

The socio-demographic characteristics of teenagers

The teenagers spanning different age groups (14-17) did not exhibit significant differences; however, a substantial majority (60%) fell within the 14- to 15-year-old

bracket. Distinct disparities emerged when considering gender and its correlation with physical activity preferences ($p<0.001$ for the χ^2 test, CV 0.3). Notably, female respondents displayed a higher inclination towards physical recreation at a rate of 55.6%, while males were more prone to engage in combat sports (62.2%) and team sports (78.3%). Primary school students were more inclined towards team sports (37%), whereas comprehensive secondary school students demonstrated a higher tendency for combat sports (24.3%) ($p<0.014$ for the χ^2 test; CV 0.1). The majority of the respondents resided in urban areas (67.3%). Team sports were more prevalent among the inhabitants of rural areas, accounting for 48.3% ($p<0.014$ for the χ^2 test; CV 0.2). No significant variance assessment of financial status among the respondents; predominantly, they rated their financial situation as very good or average, with fewer individuals categorizing it as bad (Table 1).

Table 1. Socio-demographic characteristics of teenagers (independence χ^2 test, and *CV*).

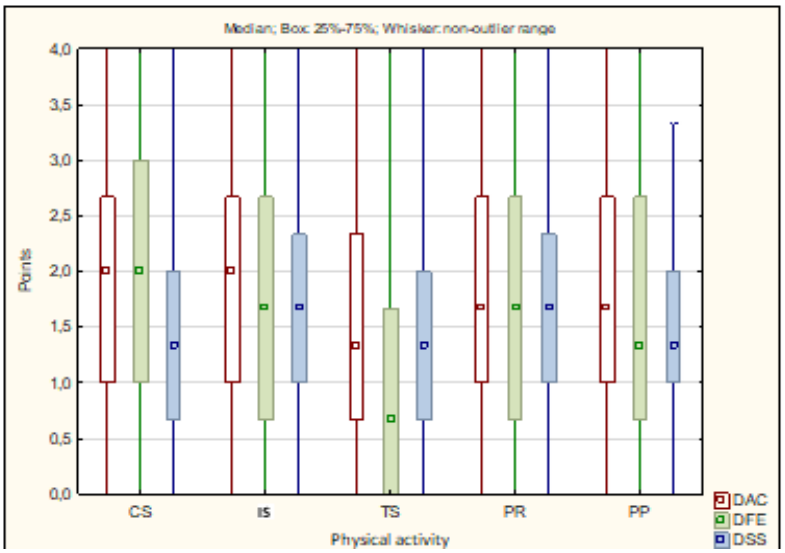
Variable	Physical activity (%)					Total	
	CS (*n* = 37)	**IS** (*n* = 179)	**TS** (*n* = 92)	**PR** (*n* = 99)	**PP** (*n* = 55)	***n* = 462**	**%**
Age (years)							
14	40.5	31.8	40.2	32.3	30.9	158	34.2
15	24.3	25.1	25.0	29.3	29.1	122	26.4
16	13.5	24.6	16.3	21.2	16.4	94	20.3
17	21.6	18.5	18.5	17.2	23.6	88	19.1
Sex* **							
women	37.8	51.4	21.7	55.6	52.7	210	45.5
men	62.2	48.6	78.3	44.4	47.3	252	54.5
Education level*							
primary level 1	16.2	28.5	37.0	29.3	23.6	133	28.8
vocational	13.5	8.9	15.2	4.0	3.6	41	8.9
secondary vocational	46.0	44.1	28.3	50.5	58.2	204	44.1
secondary	24.3	18.4	19.6	16.2	14.6	84	18.2
Place of residence**							
city	67.6	73.6	51.7	66.0	74.6	306	67.3
village	32.4	26.4	48.3	34.0	25.4	149	32.7
Financial situation							
very good	27.0	36.3	32.6	37.4	23.6	155	33.6
average	56.8	53.1	50.0	44.4	61.8	240	52.0
sufficient	8.1	3.9	3.3	8.1	9.1	26	5.6
no rating	8.1	6.7	14.1	10.1	5.5	41	8.8

*p<0.05; **p<0.01; *** p<0.001

CS combat sports, **IS** individual sports, **TS** team sports, **PR** physical recreation, **PP** occasional physical activity.

Dispositional and situational ways of coping with stress by teenagers

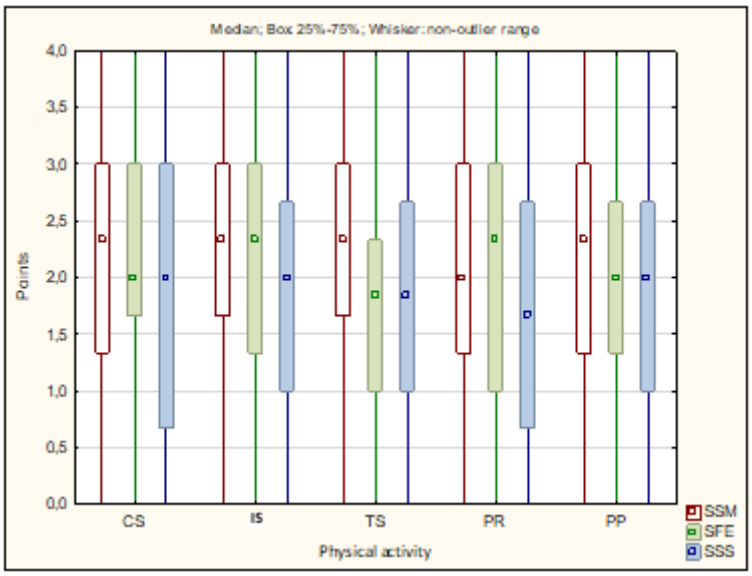
The teenagers used various ways of coping with stress in difficult situations. There was general variation in dispositional (invitation of the whole class for a birthday party, except for the tested person), active coping by teenagers ($p = 0.058$ for the H-test; statistical tendency) and focusing on emotions ($p = 0.009$ for the H-test). The respondents, however, did not differ in the frequency of seeking social support (Figure 1).



DAC dispositional active coping with stress; **DFE** dispositional focus on emotions; **DSS** dispositional search for social support.

Figure 1. Descriptive statistics for dispositional (standard) ways of coping with stress by adolescents with varied physical activity.

When examining the situational coping strategies as described by the youth, a notable variation was detected in the degree of intensity related to emotional focus ($p = 0.038$ for the H-test). However, there were no discernible differences observed in the situational strategies of actively coping with stress and seeking social support among the surveyed teenagers (Figure 2).



SSM situational stress management; **SFE** situational focus on emotions; **SSS** situational search for social support.

Figure 2. Descriptive statistics for situational ways of coping with stress by adolescents with varied physical activity.

Categories of stressful situations described by adolescents

The surveyed adolescents reported the existence a total of 795 challenging situations, varying in frequency from one occurrence to three or more instances (Table 2). Predominantly, difficulties linked to maintaining social connections with peers, which had been strained during the pandemic, were the most frequently encountered. These challenges were more pronounced among individuals engaged in combat sports, those partaking in physical recreation, and those who were occasionally physical activity ($p<0.035$ for the χ^2 test). Poor health was experienced by a total of 43% of the respondents (mental health problems 32%; physical health problems 11%).

Table 2. Categories of stressful situations described by adolescents with varied physical activity (independence χ^2 test, and *CV*).

Problem categories	Physical activity					Total	
	CS (n = 37)	IS (n = 179)	TS (n = 92)	PR (n = 99)	PP (n = 55)	*n* = 462	%
broken ties with peers*	56.8	46.7	46.7	61.6	56.4	275	59.5
insufficient contacts with teachers	40.5	45.8	33.7	36.4	29.1	180	39.0
mental health problems*	43.2	36.9	26.1	27.3	27.3	148	32.0
physical health problems	8.1	1.4	14.1	9.1	13.6	51	11.0
learning difficulties	4.3	51.1	25.3	12.8	6.4	47	10.2
family disagreements*	16.2	12.3	5.4	5.1	3.6	40	8.7
other problems	13.9	38.9	13.9	27.8	5.6	36	7.8
reluctance to talk	7.7	42.3	15.4	23.1	11.5	26	5.7
love problems	16.7	38.9	33.3	5.6	5.6	18	3.9

*$p<0.05$; percentages do not add up to 100 because the number of difficult situations was not limited. **CS** combat sports, **IS** individual sports, **TS** team sports, **PR** physical recreation, **PP** occasional physical activity;.

Mental health issues were more frequently reported by individuals engaged in combat sports (43.2%) and individual sports (36.9%) ($p<0.056$ for the χ^2 test. Family problems were reported by 8.7% of the respondents. They were reported more often by people practicing combat sports and other individual sports ($p<0.035$ for the χ^2 test). People practicing individual sports and combat sports had more problems with solving difficult situations. Insufficient interaction with teachers, as reported by 39% of respondents, likely contributed to learning difficulties (10.2%). Combat sports practitioners also experienced insufficient interaction with teachers, though the fewest individuals reported encountering learning challenges. Romantic relationship issues led to stress for 3.6% of respondents. Around 8% of teenagers highlighted other issues (e.g., being subjected to peer mockery due to weight and appearance 14 individuals; non-compliance with the law 5 individuals; experiencing cyberbullying and harassment 3 individuals; violence involving friends 2 individuals; substance abuse and excessive alcohol consumption 4 individuals). Two individuals experienced thoughts of suicide. A portion of respondents (5.7%) chose not to disclose their difficulties, deeming them too difficult to address.

Dispositional and situational strategies of coping with stress by teenagers

Inter-group comparisons (Table 3) reveal disparities in dispositional active coping between individuals engaged in individual sports and those participating in team sports ($p = 0.002$ for the *U* test). Notably, practitioners of individual sports exhibited a higher inclination toward adopting active coping strategies when confronted with challenging situations. Furthermore, a marked propensity for dispositional emotional

focus was observed among individuals engaged in combat sports and other individual sports, in contrast to those involved in team sports (p = 0.001 for the *U* test, *rg* = 0.433; p = 0.001 for the *U* test; rg = 0.356, respectively). Individuals engaged in team sports exhibited a lesser tendency towards emotional focus compared to those involved in physical recreation and those who were occasionally physical activity (p = 0.001 for the *U* test, *rg* = −0.352; p = 0.001 for the *U* test, *rg* = −0.319, respectively). These differences are confirmed by values above the average effect strength. Moreover, in the context of resolving challenging situations, competitors practicing individual sports displayed a greater proclivity for seeking social support compared to those engaged in team sports (p = 0.022 for the *U* test, rg = 0.170).

Disparities in situational emotional focus between individuals engaged in individual sports and physical recreation on one hand, and those involved in team sports on the other, are highlighted through inter-group comparisons (p = 0.002 for the *U* test, rg = 0.228; p = 0.040 for the *U* test, rg = −0.172, respectively). Both individuals practicing individual sports and those engaged in physical recreation displayed a heightened emphasis on emotional behaviours compared to their counterparts involved in team sports.

Table 3. Dispositional and situational ways of coping with stress (HDC) by teenagers practicing combat sports (CS), other individual sports (IS), team sports (TS), physical recreation (PR) and exercising occasionally (PP) (the *H*-test, ε^2, the *U* test, *rg*).

Strategies and ways of coping with stress	Physical activity	p-value for the *U* test				Glass rank biserial correlation (*rg*)				Rank mean
		IS	TS	PR	PP	IS	TS	PR	PP	
Dispositional active coping with stress										
H-test 4,460 = 9.1 ε^2 = 0.020 p = 0.059	CS	0.777	0.119	0.596	0.710	−0.030	0.176	0.059	0.046	240.0
	IS		**0.003****	0.214	0.332		0.222	0.090	0.086	247.8
	TS			0.119	0.153			−0.131	−0.141	197.0
	PR				0.923				−0.010	227.0
	PP									228.8
Dispositional focus on emotions										
H-test 4,460 = 29.1 ε^2 = 0.063 **p = 0.000*****	CS	0.340	**0.000*****	0.373	0.277	0.100	0.433	0.099	0.134	267.5
	IS		**0.000*****	1.000	0.703		0.356	0.000	0.034	245.6
	TS			**0.000*****	**0.001*****			−0.352	−0.319	164.4
	PR				0.729				0.034	245.4
	PP									237.7
Dispositional search for social support										
H-test (4,460) = 5.7 ε^2 = 0.012 p = 0.221	CS	0.464	0.417	0.943	0.819	−0.076	0.092	−0.008	0.029	228.2
	IS		**0.022***	0.414	0.170		0.170	0.059	0.122	245.8
	TS			0.217	0.523			−0.104	−0.063	206.7
	PR				0.618				0.048	231.4
	PP									219.5
Situational stress management										
H-test (4,60) = 1.8 ε^2 = 0.004 p = 0.777	CS	0.713	0.919	0.764	0.643	−0.038	−0.012	0.034	−0.057	226.6
	IS		0.561	0.226	0.811		0.043	0.087	−0.021	236.9
	TS			0.630	0.533			0.041	−0.062	227.2
	PR				0.339				−0.093	217.7
	PP									240.8
Situational focus on emotions										
H-test (4,460) = 10.1 ε^2 = 0.022 **p = 0.039***	CS	0.786	0.059	0.840	0.439	−0.028	0.213	0.023	0.095	241.3
	IS		**0.002****	0.434	0.181		0.228	0.056	0.119	247.4
	TS			**0.040***	0.352			−0.172	−0.092	195.1
	PR				0.485				0.068	234.6
	PP									218.9
Situational search for social support										

Strategies and ways of coping with stress	Physical activity	p-value for the *U* test				Glass rank biserial correlation (*rg*)				Rank mean
		IS	TS	PR	PP	IS	TS	PR	PP	
H-test (4,460) =1.6 ε^2 = 0.003 p = 0.814	CS	0.840	0.979	0.632	0.674	−0.021	−0.003	0.054	0.052	232.5
	IS		0.645	0.284	0.371		0.034	0.077	0.079	238.4
	TS			0.520	0.679			0.054	0.041	231.3
	PR				0.971				−0.004	220.1
	PP									220.8

*****p<0.05; ******p <0.01; ******* p<0.001

All correlations were statistically significant, most at p<0.001 (Table 4). In the dispositional strategy (being left out of a birthday invitation) and the situational strategy (a personal problem indicated by the study participant), adolescents used similar coping methods. Moderate positive correlations were found between dispositional and situational active coping with stress (r_s = 0.501), focusing on emotions between DFE and SFE (r_s = 0.554), and seeking social support between DSS and SSS (r_s = 0.516).

Table 4. Spearman correlations between dispositional and situational strategies of active coping, focusing on emotions and seeking social support by adolescents.

Strategies and ways of coping with stress			
Dispositional strategies	**Situational strategies**		
	SSM	**SFE**	**SSS**
DAC active coping with stress	**0.501*****	**0.272*****	**0.218****
DFE focus on motions	**0.170***	**0.554*****	**0.225****
DSS search for social support	**0.230****	**0.367*****	**0.516*****

*p<0.05; **p <0.01; ***p<0.001; **SSM** situational stress management; **SFE** situational focus on emotions; **SSS** situational search for social support.

4. Discussion

In our own research, the hypothesis suggesting a connection between diverse physical activity patterns among teenagers (engaged in distinct individual sports, combat sports, team sports, recreational physical activities, occasional physical activity) and their preferred coping strategies for stress was partially substantiated.

Our findings indicated that teenagers tend to employ analogous coping strategies in both dispositional and situational contexts. Further analysis of group comparisons demonstrated that in the dispositional strategy active coping with stress was more prevalent among individuals engaged in individual sports in comparison to those engaging in team sports. Individuals engaging in team sports less frequently displayed a reduced inclination towards the dispositional coping strategy of emotional focus when contrasted with other respondents (CS, IS, PR, PP). People practicing individual sports more often sought social support compared to those practicing team sports. As for their situational coping strategy, no disparities were observed in terms of active coping with stress, seeking social support, and their preferred form of physical activity. Those participating in team sports demonstrated a diminished intensity in their situational focus on emotions compared to individuals involved in individual sports. It appears that the influence of subjective resources, particularly

the capacity to sustain peer relationships prior to the pandemic, could potentially have exerted a positive impact on coping mechanisms during the pandemic [38].

Research has established that employing a diverse array of coping strategies in stressful circumstances and displaying adaptability in coping approaches have a positive influence on enhanced psychological adaptation and are correlated with improved social competences among children and adolescents [39]. Furthermore, it has been indicated that teenagers exhibit a propensity to modify their coping strategies based on situational demands, and as they mature, they tend to become more flexible in this regard [17, 40, 41]. In instances where an individual perceives a lack of opportunities for change, the utilization of strategies cantered on managing emotions is particularly beneficial [42]. The process of coping with stress in children and adolescents, entailing the selection of appropriate strategies, is subject to developmental changes encompassing factors such as the scope and level of control over one's own life, cognitive and emotional processes, and the awareness and regulation of emotions [43].

Increased time dedicated to physical activity has been linked to reduced stress levels in teenagers. Research indicates that engaging in physical activity, irrespective of its intensity, can effectively contribute to stress management and mitigate stress-related mental health issues in adolescents [44].

In our own research, teenagers engaged in different types of physical activity were not free from problematic situations. It was observed that the most experienced problems were related to maintaining social connections with peers, followed by poor health, as well as insufficient interaction with teachers. The deficiency in mental health, more frequently indicated by those practicing various types of combat sports (including karate) compared to those engaged in team sports, physical recreation, and non-exercisers, was not confirmed in studies involving an older group of karate practitioners (mean age 24.7 ±10.2 years). Karate practitioners rated their health higher compared to football players and those participating in physical recreation [38]. This indicates, among other things, the potential influence of age on the perception of one’s own health.

The escalation of anxiety symptoms (during the pandemic) was most strongly associated with difficulties in relationships with teachers, increased daily responsibilities, and challenges in relationships with family members and friends [39]. Adolescents were observed to function poorly, both in coping with remote learning during the pandemic [40]), and in maintaining peer relationships [41]. In our own research, difficulties in school learning were not confirmed. Learning difficulties were reported in approximately one in ten participants.

Research conducted prior to the pandemic [42] revealed that stress experienced by teenagers was frequently linked to school-related matters, parent-child dynamics, friendships, and first romantic interests. The stressors highlighted by adolescents [12] similarly encompassed school-related issues (examinations, evaluations, grades, relationships with teachers), peer interactions, family, and personal concerns. Our research outcomes appear to align with previous studies, although the sequence of the identified issues differs: severed peer relationships due to pandemic-related restrictions, health-related challenges, and inadequate interaction with teachers.

This findings underscore a pronounced sense of deprivation in terms of peer contacts. Interestingly, according to a separate study, the most positively perceived aspect of

resuming full-time learning in September 2020, as reported by teenagers aged 16-18, was the opportunity for direct interaction with peers [41]. Moreover, teenagers' perspectives indicate that crisis situations within the peer group hold greater significance compared to those within the family environment [8].

None of the aforementioned studies had reported health problems of such magnitude among young individuals. The survey revealed that 43% of respondents experienced challenges related to mental health (including physical health issues accounting for 11%). The pandemic exerted a profound influence on the well-being of teenagers, particularly impacting their mental health [43, 44].

During the study period the proliferation of risk factors has been observed, including cyberbullying stemming from extended internet usage, behavioural addictions, exposure to domestic violence, weakening of existing friendships, disruptions in natural developmental processes (such as forming peer relationships and managing conflicts within groups), feelings of fatigue, depressive responses, conflicts with parents, and psychosomatic symptoms [1]. Amidst these challenges, it has been established that family-based social support and support from peers serve as protective factors that mitigate heightened stress and associated mental health issues among adolescents [45]. Family problems were not reported very often by the teenagers surveyed (8.7%). It can be assumed that young people did receive support from their parents and peers in dealing with difficult situations. In the dispositional stress-coping strategy, seeking social support was used by all adolescents, but was more frequent among those practicing individual sports. In the methodology of research on social health, there is a lack of a universally accepted theory. Theorists of social health have not clearly defined its manifestations. To date, only a limited number of instruments for measuring social health have been developed [46]. Social support is considered to be directly related to social health [47, 48]. Social support perceived by adolescents (within the family and peer group) reduces aggression and enables better emotional regulation. In contrast, other problems reported by approximately 8% of adolescents (such as peer ridicule for various reasons, law violations, experiences of cyberbullying, harassment, drug use, and excessive alcohol consumption) generate aggression, contribute to academic failure and social maladjustment, and thereby weaken the social health of the entire community. The behaviours reported by adolescents may represent manifestations of social health problems.

Scientific research underscores the importance of imparting stress-coping skills to young individuals. During adolescence, coping strategies often vary and lack consistency. In the pursuit of safeguarding the physical and mental well-being of teenagers, hand-to-hand combat sports can serve as a valuable means of addressing this distinct form of stress. In experimental studies involving karate practitioners and individuals leading a sedentary lifestyle, it was observed that regular karate practice over eight weeks reduced high levels of stress to moderate levels and increased moderate levels of self-confidence to high levels among the participants. The karate practice had similar effects in both sexes. The authors recommend directing young people to karate as an effective method of coping with stress and increasing self-confidence, especially for students aged 14–17 years [49]. Despite the confirmed positive impact of karate practice on adolescent development, concerns remain regarding the implementation of training programs that still focus solely on achieving sports performance. Research on prosocial and antisocial behaviours, aggression, and psychophysical resilience shows a diversity of behaviours among karate practitioners

(both positive and negative). In martial arts systems, the potential of combat sports (physical and mental development, enhancement of self-confidence, resilience, self-discipline, emotional control, and stress management) is not always fully utilized [50].

According to certain researchers, the connection between the risk of depression (which includes manifestations like stress) and physical activity in adolescents remains ambiguous [51]. The psychological stress and physical activity are intertwined, yet the precise nature of this relationship remains indistinct [52]. Stress can potentially lead to both a reduction and an escalation in physical activity. These phenomena require further research and may explain the weak relationships observed in many studies. There is a need to increase opportunities for physical activity, strengthen social bonds, teach skills for coping with difficult situations, recreate conditions that support the fulfilment of adolescents' developmental needs, in the context of promoting a healthy lifestyle.

A study [53] found that physical exercise directly reduces anxiety in various social situations and indirectly enhances adolescents' psychological resilience. Strengthening individual resilience and coping with social stress are associated with physical activity, especially long-term activity. It has also been confirmed that physical activity has a positive effect on mental health and allows for the prediction of its future state [54].

Limitations and future direction

The present study examined the correlation between coping strategies in challenging situations among **adolescents** with diverse levels of physical activity. To establish whether the employed strategies contributed to stress reduction, it would be necessary to ascertain both the stress levels and the specific context in which the surveyed youth were situated. This aspect warrants further investigation to determine the efficacy of the employed strategies on an individual basis.

Practical implications

The study results demonstrate practical opportunities for psychological, educational, family, and social interventions in the context of the importance of physical activity in promoting adolescents' mental health. To reduce stress in children and adolescents, it is important to educate them on effective stress coping methods and to establish conditions for regular physical activity integrated into their daily lives. It is also important to make physical education teachers, instructors and sports trainers, school psychologist as well as parents, aware of effective methods of dealing with stress in connection with the physical activity of young people. Effective ways of coping with stress and improving mental and physical health can be provided to teenagers through compulsory health education in schools and the promotion of physical activity in society.

The use of innovative agonology—addressing health promotion, prevention, and therapy across all dimensions of health, as well as the optimization of actions that enhance survival capacity [55], can enhance the effectiveness of educational activities.

Conclusions

The multitude of issues highlighted by teenagers, stemming from limitations in meeting their developmental needs, has prompted the pursuit of solutions aimed at aiding these surveyed youth in managing challenging circumstances. Proficient stress coping serves to shield young individuals from the societal and health ramifications associated with prolonged stress. One measure to foster effective stress coping and enhance the physical and mental well-being of adolescents is the promotion of physical activity. Presently, there exists a demand to expand avenues for physical activity, reinforce social connections, impart skills for navigating difficult situations, and recreate environments conducive to addressing the developmental needs of teenagers.

From the perspective of the perspective of social well-being, research into strategies for coping with difficult circumstances among adolescents is of great importance. Shortly after the pandemic, despite posing threats to public health, offers unprecedented opportunities to study adolescents who, for about two years, with some interruptions, have been mainly engaged in remote learning. Delving into health-related behaviour patterns, recreational preferences, levels of physical activity and preferred stress coping techniques can provide valuable information on the effectiveness of preventive measures.

Data Availability Statement: The data supporting this study's findings are available from the corresponding author upon reasonable request.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institute of Psychology Ethical Committee for Research Projects of the University of Szczecin (KB 27/21).

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References

1. Jones EAK, Mitra AK, Bhuiyan AR. Impact of COVID-19 on Mental Health in Adolescents: A Systematic Review. Int J Environ Res Public Health 2021; 18(5): 2470
2. Panda PK, Gupta J, Chowdhury SR et al. Psychological and Behavioral Impact of Lockdown and Quarantine Measures for COVID-19 Pandemic on Children, Adolescents and Caregivers: A Systematic Review and Meta-Analysis. J Trop Pediatr 2021; 67(1): fmaa122
3. Shepherd HA, Evans T, Gupta S et al. The Impact of COVID-19 on High School Student-Athlete Experiences with Physical Activity, Mental Health, and Social Connection. Int J Environ Res Public Health 2021;18(7): 3515
4. Guthold R, Stevens GA, Riley LM et al. Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants. Lancet Child Adolesc Health 2020; 4(1): 23–35
5. Zolopa C, Burack JA, O'Connor RM et al. Changes in youth mental health, psychological wellbeing, and substance use during the COVID-19 pandemic: A Rapid Review. Adolesc Res Rev 2022; 7: 161-177
6. Juczyński Z, Ogińska-Bulik N. Jak Sobie Radzisz — JSR. W: Juczyński Z, Ogińska-Bulik N. Narzędzia pomiaru stresu i radzenia sobie ze stresem. Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego. Warszawa: 2012: 59-70. Polish
7. Allen JP, Loeb E, Tan J et al. The body remembers: adolescent conflict struggles predict adult interleukin-6 levels. Dev Psychopathol 2018; 30(4): 1435–1445

8. Lelek A, Mostowik J, Kwapniewska A et al. Jak nastolatki radzą sobie z sytuacjami kryzysowymi? Wstępne doniesienia z badań nastolatków z zaburzeniami depresyjnymi i lękowymi. Psychoterapia 2021; 4(199): 49-63. Polish
9. Allen JP, Uchino BN, Hafen CA. Running with the pack: teen peer-relationship qualities as predictors of adult physical health. Psychol Sci 2015; 26(10): 1574-1583
10. Hayes G, Dowd KP, MacDonncha C et al. Tracking of Physical Activity and Sedentary Behavior From Adolescence to Young Adulthood: A Systematic Literature Review. J Adolesc Health 2019; 65(4): 446-454
11. Ochojska D. Radzenie sobie ze stresem uczniów w okresie dorastania. Edukacja – Technika – Informatyka 2018; 4(26): 467-474. Polish
12. Talik E. Specyfika stresu szkolnego i strategie radzenia sobie z nim przez młodzież w okresie dorastania. Horyzonty Psychologii 2011; 1(1): 127-137. Polish
13. Korczyński S. Stres edukacyjny gimnazjalistów. Rocznik Polsko-Ukraiński 2014; 16: 89-110. Polish
14. Jodłowska B, Ogińska H, Bilski J et al. Modele radzenia sobie ze stresem i cechy antropometryczne u młodzieży gimnazjalnej. Hygeia Public Health 2010; 45(2): 127-134. Polish
15. Rutkowska K, Gierczuk D. Młodzież wobec sytuacji trudnych – na przykładzie zawodników uprawiających zapasy i nietrenujących uczniów. In: Poleszak W, editor. Wyzwania i zagrożenia adolescencji. Lublin: WSEI; 2016: 180-194. Polish
16. Kim HJ, Oh SY, Lee DW et al. The Effects of Intense Physical Activity on Stress in Adolescents: Findings from Korea Youth Risk Behavior Web-Based Survey (2015-2017. Int J Environ Res Public Health 2019; 16(10): 1870
17. Kotarska K, Nowak MA, Timoszyk-Tomczak C. Coping with stress among physically active and inactive students at different educational stages during the pandemic. Acta Kinesiologica 2024; 18.1.2; 9-15
18. Zaleszczyk A, Oświeczyńska K, Kasprzak A et al. Physical Activity in Psychiatry: Mechanisms and Efficacy in the Integrated Treatment of Depression. J Innov Technol Soc Sci 2025; 3(47): 3660
19. Mitra R, Moore SA, Gillespie M et al. Healthy movement behaviours in children and youth during the COVID-19 pandemic: Exploring the role of the neighbourhood environment. Health Place 2020; 65: 102418
20. Hommes F, van Loon W, Thielecke M et al. SARS-CoV-2 Infection, Risk Perception, Behaviour, and Preventive Measures at Schools in Berlin, Germany, during the Early Post-Lockdown Phase: A Cross-Sectional Study. Int J Environ Res Public Health 2021; 18 (5): 2739
21. Moore SA, Faulkner G, Rhodes RE et al. Few Canadian Children and Youth Were Meeting the 24-Hour Movement Behaviour Guidelines 6-Months into the COVID-19 Pandemic: Follow-up from a National Study. App Physiol Nutr Metab 2021; 46: 1225-1240
22. Bronikowska M, Krzysztoszek J, Łopatka M et al. Comparison of Physical Activity Levels in Youths before and during a Pandemic Lockdown. Int J Environ Res Public Health 2021; 18(10): 5139
23. Nathan A, George P, Ng M et al. Impact of COVID-19 Restrictions on Western Australian Children's Physical Activity and Screen Time. Int J Environ Res Public Health 2021; 18(5): 2583
24. Szeszulski J, Lanza K, Dooley EE et al. Y-PATHS: Conceptual Framework for Classifying the Timing, How, and Setting of Youth Physical Activity. J Phys Act Health 2021; 18(3): 310-317
25. Do B, Kirkland C, Besenyi GM et al. Youth physical activity and the COVID-19 pandemic: A systematic review. Prev Med Rep 2022; 29: 101959
26. Pandemia Covid-19. Sytuacja w wybranych krajach europejskich. Warszawa: OT–680, Kancelaria Senatu; 2020. Available from: [https://www.senat.gov.pl/gfx/ senat/pl/senatopracowania/186/plik/ot-680.pdf]. Polish
27. Rozporządzenie Rady Ministrów z dnia 25 marca 2022 r. w sprawie ustanowienia określonych ograniczeń, nakazów i zakazów w związku z wystąpieniem stanu zagrożenia epidemicznego (Dz. U. poz. 679). Available from: [https://sip.lex.pl/akty-prawne/dzu-dziennik-ustaw/ustanowienie-okreslonych-ograniczen-nakazow-w-zwiazku-z-19220929]. Polish
28. Dobosz W, Gąsienica-Walczak B, Kalina A et al. The 'physiotherapist in every school' project is the first step in replacing the physical education paradigm with the subject of preventive medicine in every type of school – a perspective to improve public health and safety in a rational community. Arch Budo J Inn Agon 2024; 20: 287-303
29. Kalina RM. Teoria sportów walki. Warszawa: COS; 2000. Polish
30. Huang PJ, Cherkashina E, Cherkashin I et al. Historical and pedagogical experience in national *khapsagai* wrestling and its implementation in modern physical education practice. Arch Budo 2021; 17: 329-339

31. Huang PJ, Ermakov P, Fedorova O et al. Influence of a 16-week training program with *Muay Thai* components on BMI, body composition, and risk of sudden cardiac death among obese men. Arch Budo 2021; 17: 185-196
32. Zhang XQ, Liu Y, Zhang W et al. The effect of Chinese traditional exercise on cognitive function improvement in the elderly – meta analysis. Arch Budo J Inn Agon 2021: 17: 307-318
33. Kruszewski A. Antique wrestling is the prototype of a relatively gentle and honourable self-defence. Arch Budo Sci Mart Art Extreme Sport 2023; 19: 5-10
34. Kruszewski A. Wrestling fight-between tradition, sport and spectacle. Arch Budo 2023; 19: 21-27
35. Harasymowicz J. Humanistic and pedagogical dilemmas in teaching and promoting combat sports. Arch Budo J Inn Agon 2024; 20:16-28
36. Kruszewski A, Cherkashin I, Kruszewski M et al. Hand-to-hand combat in the 21st century-INNOAGON warrior or modern gladiator? – a prospective study. Frontiers in Sports and Active Living 2024; 6: 1-7
37. Compas BE, Connor-Smith JK, Saltzman H et al. Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. Psychol Bull 2001; 127(1): 87-127
38. Nowak MA, Kolbowicz M, Kuska M, et al. Correlations between the intensity of health behaviour and the quality of life of people practicing karate, football and physical recreation. Arch Budo J Inn Agon 2025, 21: 140-156
39. Woźniak-Prus M, Gambin M, Cudo A. Nastolatkowie wobec pandemii. Raport nr 11 z badania przeprowadzonego w Instytucie Psychologii Akademii Pedagogiki Specjalnej im. Marii Grzegorzewskiej w Warszawie we współpracy z Wydziałem Psychologii Uniwersytetu Warszawskiego podczas epidemii COVID-19 w 2020. Available from: [https://covid.psych.uw.edu.pl/wp-content/uploads/sites/50/ 2021/03/raporty-covid-2020.pdf]. Polish
40. Simm I, Winklhofer U, Naab T et al. How Children and Adolescents Perceive Their Coping With Home Learning in Times of COVID-19: A Mixed Method Approach. Front Psychol 2021; 12: 733428
41. Chwaszcze J, Łysiak M, Mamcarz S. Jakość życia adolescentów w czasie pandemii Covid-19. Część I. Toruń: Wyd. Adam Marszałek 2022. Available from: [https://depot.ceon.pl/handle/123456789/21758]. Polish
42. Pincus DB, Friedman AG. Improving children's coping with everyday stress: transporting treatment interventions to the school setting. Clin Child Fam Psychol Rev 2004; 7(4): 223-240
43. Makaruk K, Włodarczyk J, Szredzińska R. Negatywne doświadczenia młodzieży w trakcie pandemii. Raport z badań ilościowych 2020. Warszawa: Fundacja Dajemy Dzieciom Siłę 2020. Available from: [https://fdds.pl/co-robimy/raporty-z-badan/2020/ negatywne-doswiadczenia-mlodziezy-w-trakcie-pandemii-2020.html]. Polish
44. Szredzińska R, Włodarczyk J. Doświadczenia krzywdzenia oraz dobrostan psychiczny polskich nastolatków w pierwszym okresie pandemii. Dziecko Krzywdzone. Teoria, badania, praktyka 2021; 20(2): 38-62. Polish
45. Luijten MAJ, van Muilekom MM, Teela L et al. The impact of lockdown during the COVID-19 pandemic on mental and social health of children and adolescents. Qual Life Res 2021; 30(10): 2795-2804
46. Jost GM, Hang S, Shaikh U et al. Understanding adolescent stress during the COVID-19 pandemic. Curr Opin Psychol 2023; 52: 101646
47. Caplan M, Bennetto L, Weissberg R. The role of interpersonal context in the assessment of social problem-solving skills. J Appl Dev Psychol 1991; 12: 103-114
48. Clarke AT. Coping with interpersonal stress and psychosocial health among children and adolescents: a meta-analysis. J Youth Adolesc 2006; 35(1): 10-23
49. Yıldız ME, Günel I. The effect of karate practice on stress and self-confidence levels: an empirical practice among sedentary teenagers. IJOEEC 2022; 7(18): 1385-1394
50. Nur AM, Komarudin K, Muhtar T et al. Positive Youth Development (PYD) in Martial Arts Activities: Literature Review. IJDSHS. 2024; 7(4): 914-922
51. Gu J. Physical Activity and Depression in Adolescents: Evidence from China Family Panel Studies. Behav Sci (Basel) 2022; 12(3): 71
52. Reichert M, Brüßler S, Reinhard I et al. The association of stress and physical activity: Mind the ecological fallacy. Ger J Exerc Sport Res 2022; 52: 282–289
53. Wu J, Shao Y, Zang W et al. Is physical exercise associated with reduced adolescent social anxiety mediated by psychological resilience?: evidence from a longitudinal multi-wave study in China. Child Adolesc Psychiatry Ment Health 2025; 19: 17
54. Zhang M, Gu C, Zeng H et al. The impact of physical activity on adolescent mental health status: the mediating effect of school adaptation. Front Psychol 2025; 16:1573129

55. Kalina RM. Innovative Agonology– Its Definition, Detailed Theories, General Rule of Struggle, and Laws Healthcare and Medical Devices 2023; 79: 272–279

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