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Stress and burnout with remote learning and psychoactive substance use as predictors of students' psychological well-being during the Covid-19 pandemic

Abstract: Introduction: Engaging in health risk behaviors, along with educational problems, are among the main factors negatively affecting adolescents' health and mental well-being. However, stress and burnout from remote learning and substance abuse during the Covid-19 pandemic as predictors of students' psychological well-being have not yet been studied more extensively in Poland and around the world. With this in mind, the purpose of the study conducted was to see if there was a relationship between stress, school burnout and psychoactive substance use and students' psychological well-being.

Method: The study was conducted via the Internet using the following methods: *Remote Learning Burnout Scale*, *Risk Behavior Questionnaire*, *Caroll Ryff Brief Mental Well-Being Scale*, *1 Question Measurement of Educational Stress*. The group of study subjects consisted of 186 adolescents (60% girls) with a mean age of $M = 15.93$ years ($SD = 1.70$ years).

Results: The data obtained indicate that the most common psychoactive substance used by adolescents was alcohol (38% of students) and nicotine (32% of students). Statistically significant negative associations were confirmed between psychological well-being and stress and burnout with remote learning, as well as more frequent use of tobacco and hanging out with addicts. Remote learning burnout syndrome correlated positively with smoking and marijuana

use, as well as alcohol consumption and binge drinking. In the summary regression model, only remote learning burnout and cigarette use proved to be significant predictors, explaining 18% of the variance in the students' psychological well-being score.

Conclusions: The data obtained unequivocally confirmed that effective mental health promotion among adolescents must take into account two key areas of prevention, i.e. strategies for coping with educational cyber-stress and remote learning burnout, as well as psycho-prevention focused on minimizing the risk of young people turning to psychoactive substances.

Key words: school stress, remote learning burnout, psychoactive substance use, psychological well-being

Introduction

Risky behaviors are defined as activities that carry a high risk of negative consequences for an individual's physical and mental health, as well as for their social environment (Ostaszewski, 2003). This type of behavior occurs at every stage of development and is a serious social problem regardless of culture. However, among researchers of this phenomenon, most agree that adolescence is a developmental stage in which the risk of young people engaging in various types of problem behavior increases (Kohútová et al., 2021). Hitherto theoretical and empirical models that explain this phenomenon indicate both internal sources of risky behavior (including biological determinants, identity formation processes, self-esteem and specific personality traits, deficits in emotion regulation, and low interpersonal competence) and external factors increasing the likelihood of their occurrence, such as situational factors (e.g., traumatic experiences, victimization); social environment characteristics (e.g., irregularities in the family system or peer pressure), and a broader ecological context (historical factors related to global threats and crises) (Jerssor, Jessor, 1977; Koven et al., 2005; Glanz et al., 2008; Fosco et al., 2012; Çakar, Tagay, 2017; Holloway et al., 2022; Barati et al., 2023). Incorporating a socio-ecological perspective into explaining the health-promoting and risky behaviors of youth has directed researchers' attention to the interactions of risk factors typical of the microsystem (family, peers, school) with factors present in the macrosystem (healthcare, government prevention policy, social and intercultural relations, global crises) (Aytur et al., 2022). In this context, the significance of global threats is emphasized, acting as a strong stressor for individuals as they necessitate a change in their previous ways of reacting and daily functioning. According to researchers, the Covid-19 pandemic is a phenomenon of such impact. For some students, it was a highly stressogenic and even traumatic experience due to the high risk of illness and death. Some theorists and practitioners even point to the high probability of the emergence of the so-called "pandemic generation," characterized by experiencing pandemic syndrome and covidolienation (intensified isolation anxiety, a sense of helplessness, loneliness, experiencing mental suffering, rooted in uncertainty, the

perception of chronic pandemic stress, the threat of infection, and the consequences of the ubiquitous infectious disease – Covid-19) (Ściupider-Młodkowska, 2022). Simultaneously, the need to maintain physical distance and compulsory isolation from support received from the peer and school environment was associated with cutting off young people from essential factors that allow the shaping of autonomy and identity, significantly affecting their mental well-being (Pyżalski, 2021; Bobrowski et al., 2022). Bigaj and Dębski (2020) revealed that almost half (48%) of surveyed adolescent students felt worse three months after the closure of schools than before the pandemic (with 18% marking “much worse”). As Dubey et al. (2020) emphasize, stressful events can increase the likelihood of risky behaviors, including substance abuse, but there is also evidence in the literature of no connection (sometimes even negative) between patterns of using addictive substances (nicotine, alcohol) in relation to the Covid-19 pandemic. On the one hand, the time of isolation reduced access to nicotine or alcohol and increased parental supervision (Noel et al., 2022). However, other findings from Biagioni et al. (2022) showed that at-risk students still had access to psychoactive substances, and the quarantine period did not change that. Meta-analyses conducted by Layman et al. (2022), covering 47 studies, revealed that most researchers noted a decrease in the frequency of behaviors related to the use of psychoactive substances (nicotine, alcohol, marijuana, e-cigarettes). This was justified by the fact that teenage substance use has a close connection with the context of peer groups and the place of consumption, i.e., outside the home environment. It is essential to emphasize that ambiguous results were associated with the significant role of contextual factors, such as the age and gender of the study participants, the previous degree of addiction to psychoactive substances, and the motivation to use these substances. According to the theory of problem behaviors, the most common reasons for presenting risky behaviors in a group of adolescents are motives: escape, conformity, exploration, existential, hedonistic, and prestigious (Pudelfko, 2021). It is worth noting, however, that although the motivation to engage in such behavior varies, among the mentioned motives, difficulties of young people in coping with stress and negative emotions are also highlighted (Sinha, 2008; Garke et al., 2021; Yang et al., 2022). In this context, risky behaviors are considered a maladaptive strategy for reducing tension, anxiety, frustration, and concerns related to developmental crises, parental expectations, and academic failures (Gaś, 1995). At the same time, this type of behavior among teenagers is associated with low mental well-being, mental and physical health disorders, and poor academic achievements (Hurrelmann, Richter, 2006). The importance of conducting analyses in this area is emphasized by research revealing that the negative consequences of exhibiting risky behaviors during adolescence can persist for a long time into adulthood (Schnettler, Steinbach, 2022). Simultaneously, analyses regarding the relationship between remote learning burnout and risky behaviors among youth and mental well-being during the Covid-19 pandemic

have not been conducted in Poland. Therefore, verifying the connection between the level of mental well-being, stress, remote learning burnout, and the use of psychoactive substances seems justified.

The Resources vs. Demands educational model (SD-R) as the theoretical basis for own research

Burnout syndrome in an educational context can be understood as the result of a student's or student's experience of chronic distress, with symptoms observed in all areas of functioning, including physical and mental exhaustion, a negative and cynical attitude toward educational duties, a belief in one's lack of skills necessary for effective task completion, and a negative self-assessment in the role of a student (Salmela-Aro et al., 2009; Tomaszek, Muchacka-Cymerman, 2018). Contemporary theoretical models indicate that the gradual depletion of resources (physical, psychological, social, organizational) possessed by an individual lies at the heart of the process leading to full-blown school or academic burnout, due to the need to meet excessive demands imposed by parents or teachers (Bakker et al., 2020; Lesener et al., 2020). In the SD-R model proposed by Lesener et al. (2020), the loss of learning resources is a consequence of physical and psychological costs associated with continuous and ineffective attempts to cope with educational stressors. The development of burnout syndrome leads to the loss of health (mental and physical well-being) and is associated with problematic behaviors. At the same time, during the burnout process, so-called self-sabotaging behaviors appear, activating the process of losing balance and secondarily leading to perceiving educational demands as even more burdensome (Bakker, Demerouti, 2018). The self-sabotaging strategy serves as a mechanism to escape from the tension and difficulties experienced by the student, along with a sense of personal failure (Tomaszek, 2020). Such behaviors can take the form of escape behaviors (truancy) or discharge behaviors (aggression, cyber-aggression, and self-aggression) or be associated with health-risk behaviors such as substance abuse or cyber-addiction (Tomaszek, Muchacka-Cymerman, 2020; 2022). It is worth adding that Dolinski and Szmajke (1994) identified three types of this phenomenon: (a) behavioral strategies – a person consciously or unconsciously takes actions that prevent success, such as using psychoactive substances before an important exam; (b) non-behavioral (demonstrative) strategies – focusing on own weaknesses before taking action, e.g., expressing a bad mood; (c) symbolic strategies – a negative perception of the task situation, such as seeing the conditions for performing a task as more difficult or demanding. Self-sabotaging behaviors, on the one hand, accelerate the development of full-blown burnout, significantly reducing the chance of overcoming the stressor, and on the other hand, increase the risk of developing long-term negative consequences of this syndrome, such as

mental disorders (depression, anxiety disorders, Internet addiction, online gambling addiction), suicidal behaviors, and behaviors violating legal norms (Dyrbye et al., 2008; Ang et al., 2015; Tomaszek, 2018).

Methodology of own research

Problem and research hypotheses

The aim of the study was to find answers to the research question of whether there is a relationship between stress, school burnout, the use of psychoactive substances, and the mental well-being of students. A review of the literature allowed for the formulation of the following research hypotheses:

H1. Students with high and low mental well-being differ in the levels of stress, school burnout, and the frequency of risky behaviors related to the use of psychoactive substances.

H2. The lower the mental well-being, the higher the levels of stress, school burnout, and more frequent the tendency to use psychoactive substances.

H3. Higher school stress and academic burnout, as well as more frequent displays of behaviors related to the use of psychoactive substances, are predictors of the mental well-being of students.

Research subjects and procedure

The research was conducted in April and May of 2021. Students completed a set of psychological tools online using the Google Forms application. Before commencing the research procedure, consent to participate in the study was obtained from the directors of primary and secondary schools (12 schools located in different parts of Poland), parents, and students. The research instructions along with the link to the electronic versions of psychological methods were distributed through school emails to the students and their parents. The sample consisted of 186 students from grades 7–8 of primary school and grades 1–3 of high school. In the study, 112 girls (60%) and 74 boys (40%) participated. The age of the participants ranged from 11 to 19 years ($M=15.93$ years; $SD=1.70$ years). The research was voluntary, anonymous, and unpaid. The sample size was calculated using the G*Power program. Assuming a probability of a Type II error with a significance level of .95 for the Mann-Whitney U test, the sample size should be 184, and for binary logistic regression, it should be 145.

Research tools

The Remote Learning Burnout Scale (E-SBS) is a 22-item questionnaire developed by Tomaszek and Muchacka-Cymerman (2022). This tool allows for the assessment of the overall level of burnout with online learning and its five dimensions, namely (1) burnout with remote learning, (2) burnout with online learning due to parental pressure, (3) loss of educational interests, motivation, and aspirations, (4) negative attitude towards the e-school environment, and (5) disappointment with remote learning. The questions in this method focus on educational problems experienced by students due to chronic stress in the e-school environment during the Covid-19 pandemic. The scale is self-descriptive, with responses given on a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree). The tool's reliability is high, with a Cronbach's alpha coefficient for the overall score in this study being .89.

The Short Scale of Psychological Well-being by Carroll Ryff, in the Polish adaptation by Karaś and Ciecuch (2017), consists of 18 items measuring an individual's subjective psychological well-being. Respondents provide answers on a 5-point Likert scale (from 1 – strongly agree to 5 – strongly disagree). The scale measures six well-being domains: autonomy (AT), environmental mastery (EM), personal growth (PG), positive relations with others (PR), purpose in life (PL), and self-acceptance (SA). In this study, Cronbach's alpha for the overall score was .81.

The Risky Behaviors Questionnaire by Łosiak-Pilch (2018) comprises 31 items measuring the frequency of engagement in four types of risky behaviors among youth. Respondents assess the occurrence of risky behaviors on a 5-point scale (from never to very often). The questionnaire measures four key types of risky behaviors in Polish youth: socially unacceptable behaviors, life-threatening behaviors, "macho" risky behaviors, and extreme sports. In these analyses, items related to the use of psychoactive substances (such as cigarettes, alcohol, drugs) were utilized. The internal consistency of the overall score was $ZR \alpha = .94$, and individual subscales of ZR ranged from .63 to .94.

The current level of school stress indicator was measured using a single question: What is your current level of stress related to school duties? Participants responded on a 5-point Likert scale ranging from 1 – very low to 5 – very high.

Statistical analyses

Statistical analyses were conducted using SPSS v.22. To identify two groups of students differing in the level of mental well-being, cluster analysis using the k-means method was applied. This analysis was performed on the results obtained by the participants in the 5 dimensions of mental well-being. The identified groups turned out to be unevenly sized (chi-square test result = 7.75, $p = .005$). Analysis of the normality of variable distribution revealed statistically significant

deviations in the majority of measured indicators. Additionally, for two variables, namely smoking cigarettes and associating with individuals addicted to drugs, the assumption of homogeneity of variances was not met (significant Levine's test, $p = .001$). Considering this, non-parametric counterparts of intergroup difference tests and correlations were applied. The intergroup difference analysis was conducted based on the Mann-Whitney U test with the Monte Carlo significance test. Correlation analysis was calculated using Spearman's ρ coefficients. In the final step, binary logistic regression using the entry method was performed. The dependent variable was membership in the high vs. low level of mental well-being group. The independent variables included two indicators of school functioning, namely perceived school stress and burnout with remote learning, and six indicators of psychoactive substance use. The equation controlled for the gender of the participants.

Results of own studies

Prevalence of behaviors related to the use of psychoactive substances in the surveyed sample of students

In the surveyed sample of students, the most prevalent behavior was alcohol consumption (as much as 38% of the respondents occasionally or frequently consumed alcohol). At the same time, 4% of students indicated frequent (common or very common) binge drinking. The second most prevalent psychoactive substance was nicotine (32% of the respondents smoked cigarettes), with 9% of them using this substance frequently or multiple times. Marijuana was a substance that 11% of the surveyed adolescent population had contact with (1% smoked marijuana frequently or very frequently). Ten surveyed students used drugs, including 1% who used them multiple times. Additionally, the study considered the frequency of young people's interactions with individuals addicted to drugs, which is recognized as a risk factor for engaging in health-threatening behaviors. In the surveyed sample, nearly a quarter of respondents (18% of students) occasionally or frequently spent time in the company of individuals addicted to drugs.

Table 1. Descriptive statistics regarding the frequency of behaviors related to the use of psychoactive substances

Risky behavior	M (SD)	Never n (%)	Occasionally (rarely or sometimes) n (%)	Multiple times (often or very often) n (%)
Smoking	1.61(1.09)	126(68%)	43(23%)	17(9%)
Drinking alcohol	1.77(.97)	97(52%)	79(43%)	10(5%)

Risky behavior	M (SD)	Never n (%)	Occasionally (rarely or sometimes) n (%)	Multiple times (often or very often) n (%)
Binge drinking	1.41(.85)	139(75%)	38(21%)	9(4%)
Doing drugs	1.09(.47)	176(95%)	8(4%)	2(1%)
Smoking marijuana	1.17(.60)	165(89%)	18(10%)	3(1%)
Associating with individuals addicted to drugs	1.29(.73)	153(82%)	27(15%)	6(3%)

Inter-group difference analysis

The obtained data confirm statistically significant inter-group differences in all indicators of mental well-being among the identified groups of students. The strength of the observed differences was weak for self-acceptance, moderate for autonomy and personal development, and high for the remaining indicators (Table 2).

Table 2. Differences between students with high and low levels of mental well-being in the scope of mental well-being indicators

Name of the variable	Group 1 Students with high mental well-being (N = 112)	Group 2 Students with low mental well-being (N = 74)	U	z	p	rg
Autonomy	11.67(2.33)	9.41(2.66)	2136.00	-5.63	<.0001	-.41***
Mastery	11.51(1.67)	8.72(2.26)	1305.50	-7.97	<.0001	-.58***
Personal development	12.28(1.77)	10.45(2.18)	2143.00	-5.63	<.0001	-.42***
Positive relations	12.31(1.78)	9.14(2.79)	1440.00	-7.59	<.0001	-.57***
Objective	12.02(2.14)	10.69(2.55)	2874.00	-3.57	<.0001	-.27***
Self-acceptance	11.46(2.18)	6.86(2.04)	553.00	-10.04	<.0001	-.73***
Mental well-being	71.24(6.23)	55.26(7.16)	119.00	-11.21	<.0001	-.77***

*** $p < .0001$; ** $p < .001$, * $p < .05$

Legend: In the columns, the mean (M) values are provided, with standard deviation (SD) values in parentheses.

rg – rank-order Pearson correlation coefficient

In the next step, it was examined whether the two groups of students differ in terms of the level of perceived school stress, remote learning burnout, and the frequency of psychoactive substance use. The obtained data indicate a higher level of school burnout and school stress, as well as more frequent cigarette use among

students with low mental well-being. The strength of the effects obtained was weak. Furthermore, more frequent association with individuals addicted to drugs was noted in the group of students with low mental well-being, although the indicator value was at the level of statistical tendency ($p = .054$). The remaining variables did not significantly differentiate between the groups, thus confirming the first hypothesis only partially (Table 3).

Table 3. Differences between students with high and low mental well-being in the scope of stress, academic burnout, and indicators of psychoactive substance use

Name of the variable	Group 1 Students with high mental well-being (N = 112)	Group 2 Students with low mental well-being (N = 74)	U	z	p	rg
Remote learning burnout	67.36(14.38)	73.99(16.18)	3099.50	-2.91	.002	.21**
School stress	3.00(1.97)	3.43(1.09)	3197.00	-2.74	.003	.19**
Smoking	1.46(0.92)	1.82(1.29)	3631.50	-1.73	.041	.16*
Drinking alcohol	1.77(0.96)	1.77(0.97)	4139.50	-.01	.497	.001
Binge drinking	1.39(0.83)	1.45(0.89)	4019.50	-.46	.319	.03
Doing drugs	1.07(0.42)	1.12(0.55)	4047.00	-.69	.256	.05
Smoking marijuana	1.14(0.50)	1.22(0.73)	4074.50	.68	.338	.06
Associating with individuals addicted to drugs	1.21(0.59)	1.41(0.89)	3763.50	-1.59	.054	.14

** $p < .001$, * $p < .05$

Legend: In the columns, the mean (M) values are provided, with standard deviation (SD) values in parentheses.

rg – rank-order Pearson correlation coefficient

Relationships between mental well-being, stress, academic burnout, and the use of psychoactive substances.

Spearman's rho correlation analysis revealed statistically significant negative relationships between mental well-being and experiencing school stress ($\rho = -.20$, $p < .001$), remote learning burnout ($\rho = -.24$, $p < .001$), and two indicators related to the use of psychoactive substances, namely smoking cigarettes ($\rho = -.21$, $p < .0001$) and being in the company of drug-dependent individuals ($\rho = -.18$, $p < .05$). The obtained data are consistent with the formulated hypothesis 2. Remote learning burnout positively correlated significantly with smoking cigarettes, binge drinking, and marijuana use (Spearman's rho coefficient ranged from $\rho = .14$ to $\rho = .18$, $p < .05$). Experiencing school stress did not show statistically significant associations with the use of psychoactive substances (Table 4).

Table 4. Results of the Spearman's correlation analysis

Variables	1	2	3	4	5	6	7	8	9
1. School stress	-								
2. School burnout	.30***	-							
3. Mental well-being	-.20**	-.24**	-						
4. Smoking cigarettes	.01	.17*	-.21***	-					
5. Drinking alcohol	-.01	.13	-.09	.64***	-				
6. Binge drinking	-.06	.14*	-.11	.65***	.74***	-			
7. Doing drugs	.00	.12	-.10	.40***	.33***	.40***	-		
8. Smoking marijuana	.07	.18*	-.10	.47***	.39***	.42***	.61***	-	
9. Associating with ad-dicted individuals	.00	.05	-.18*	.38***	.36***	.41***	.35***	.31***	-

*** $p < .0001$; ** $p < .001$, * $p < .05$

Results of binary logistic regression

In the first stage of the regression analysis, where the dependent variable was the level of students' well-being, the predictive power of each independent variable was analyzed separately (eight logistic regression models were built, all well-fitted to the data – non-significant values for the Hosmer-Lemeshow test). The results obtained confirmed that significant predictors of psychological well-being were: the stress felt by students related to fulfilling school duties ($B = .38$, $p = .009$); remote learning burnout ($B = .03$, $p = .005$); and more frequent cigarette smoking ($B = .30$, $p = .031$). The remaining indicators were statistically non-significant (Table 5).

Table 5. Predictors of students' mental well-being – results of logistic regression conducted separately for each variable

Predictor	B	SE	Wald	Exp(B)	95%CI	χ^2	Nagelkerke R2
1. School stress	.38**	.15	6.80	1.46	[1.10;1.95]	7.19**	.051
2. Remote learning burnout	.03**	.01	7.97	1.03	[1.01;1.05]	8.49**	.060
3. Smoking cigarettes	.30*	.14	4.64	1.35	[1.03;1.77]	4.79*	.034
4. Drinking alcohol	.00	.16	.00	1.00	[-.74;1.36]	.00	.000
5. Binge drinking	.07	.17	.17	1.08	[-.77;1.51]	.17	.001
6. Doing drugs	.22	.32	.48	1.25	[-.67;2.32]	.49	.004
7. Smoking marijuana	.20	.25	.65	1.22	[-.75;1.99]	.66	.005
8. Associating with addicted individuals	.38	.21	3.14	1.46	[-.96;2.21]	3.33	.024

** $p < .001$, * $p < .05$

In the final stage of the analysis, it was examined whether, based on independent variables such as the level of perceived school stress, remote learning burnout, and indicators of substance use, one could predict membership in the group of students with high or low levels of mental well-being. The analysis controlled for the gender of the participants. The results confirmed that, based on the variables included in the model, it is possible to predict membership in the group of students with high or low levels of mental well-being ($\chi^2=26.28$, $p<.001$). The model was well-fitted to the empirical data (the Hosmer-Lemeshow test was statistically insignificant, chi-square=7.10, $p=.526$). In the first step, only the gender of the respondents was considered, explaining 5% of the variance in the outcome (Male gender was a predictor of belonging to the low mental well-being group $B=-.82$, $p=.010$). In the second step, indicators of substance use were analyzed. In this step, the significant predictors were the gender of the respondents and smoking cigarettes. These variables explained 12% of the variance in the outcome. In the final step of the regression model, indicators of difficulties in school functioning, such as school stress and burnout from remote learning, were considered. The data obtained indicate that a higher level of burnout from remote learning and more frequent smoking are significant predictors of lower mental well-being. The percentage of explained variance in mental well-being was 18 (Table 6). The conducted logistic regression analyses confirmed the validity of Hypothesis 3.

Table 6. The predictive role of risky behaviors related to the use of psychoactive substances and indicators of school functioning for the level of mental well-being

Predictor	B	SE	Wald	Exp(B)	95%CI	χ^2	Nagelkerke R2
Step 1							
Gendera	-.82*	.32	6.55	.44	[.24;.83]	6.81*	.049
Constant	.71	.46	2.41	2.04			
Step 2							
Gendera	-.78*	.33	5.51	.46	[.24;.88]	17.88*	.124
Smoking	.58*	.24	6.09	1.79	[1.13;2.85]		
Drinking alcohol	-.44	.31	1.97	.65	[.35;1.19]		
Binge drinking	-.22	.38	.34	.80	[.39;1.68]		
Doing drugs	-.01	.68	.00	.99	[.26;3.76]		
Smoking marijuana	.46	.54	.02	.93	[.32;2.68]		
Associating with addicted individuals	.30	.30	2.37	1.58	[.88;2.83]		
Constant	.30	.60	.24	1.35			

Predictor	B	SE	Wald	Exp(B)	95%CI	χ^2	Nagelkerke R ²
Step 3							
Gendera	-.63	.35	3.20	.53	[.27;1.06]	26.28**	.178
Smoking	.49*	.24	4.12	1.63	[1.02;2.61]		
Drinking alcohol	-.48	.32	2.31	.62	[.33;1.15]		
Binge drinking	-.15	.39	.14	.87	[.40;1.85]		
Doing drugs	.07	.72	.01	1.08	[.26;4.37]		
Smoking marijuana	-.17	.56	.10	.84	[.28;2.51]		
Associating with addicted individuals	.55	.31	3.21	1.74	[.95;3.18]		
School stress	.20	.17	1.42	1.22	[.88;1.69]		
Remote learning burnout	.03*	.01	4.55	1.03	[1.00;1.05]		
Constant	-1.49*	1.10	4.18	.11			

** $p < .001$, * $p < .05$; Legend: °1– boys, 2–girls

Discussion of the results obtained

During adolescence, patterns of behavior are shaped that can either contribute to health or harm it (Sawyer et al., 2012). During this period, some teenagers exhibit risky behaviors such as using addictive substances like tobacco, alcohol, and drugs (Miller, 2007; Layman et al., 2022), violating legal and social norms (Łosiak-Pilch, 2018), engaging in aggressive and self-destructive behaviors (Kim et al., 2017; Muarifah et al., 2022), or participating in risky sexual behaviors (Karle et al., 2023). These behaviors negatively impact the effective fulfillment of home and school duties, proper socialization, and the safety of teenagers. They can also influence their future health and life paths. It is worth mentioning the importance of positive prevention, as emphasized by Ostaszewski (2014), which aims to strengthen resources, resilience, skills, and the ability to build interpersonal relationships in the target individuals. One such resource is mental well-being, which plays a crucial role in every environment where students function, both at home and at school. It facilitates effective coping with stressors, stabilizes emotional reactions, accelerates the process of returning to mental balance in challenging situations, and reduces the risk of engaging in problematic behaviors. The mental well-being and psychological health of adolescents can be considered key protective factors in crisis situations, such as those triggered by global threats like the Covid-19 pandemic (Pyżalski, 2021). Conducting research and diagnosing the mental state of young people allow for the early and tailored design of professional support programs and the identification and outreach to youth at risk in the

area of mental health. With this in mind, the purpose of the study conducted was to see if there was a relationship between stress, school burnout and psychoactive substance use and students' psychological well-being.

In the first stage, the frequency of substance use among young people during the Covid-19 pandemic was examined. The results indicate that the most prevalent psychoactive substances were alcohol (38% of students) and nicotine (32% of students). These findings confirm earlier research, where alcohol was identified as the most prevalent psychoactive substance among youth (Ostaszewski, 2017). Concurrently, studies conducted by the WHO revealed that approximately 37% of Polish youth aged 15–18 had smoked traditional or electronic cigarettes in the last 30 days, with 60% having initiated nicotine use (Balwicki, 2020). Smoking cigarettes is a frequently occurring phenomenon that tends to increase with age. Chodkiewicz and Juczyński (2003) note that nicotine use is the most socially tolerated behavior compared to alcohol consumption or the use of psychoactive substances. Opielak et al. (2014) found that 36% of respondents aged 16–18 accepted smoking cigarettes. The authors observed, *"It is easier to reach for nicotine in the company of friends at school, explaining that it provides relief from stress."* (Opielak et al., 2014, p. 191). Among the reasons indicated by surveyed students for smoking cigarettes were the need for relaxation (26%) and escapism from problems (5%). Simultaneously, for a significant portion of youth, this phenomenon correlates moderately or highly with other risky health behaviors, including alcohol consumption or drug use. In this study, it correlated moderately or highly with all other indicators of substance use.

The primary objective of the study was to verify the research problem regarding the dependence of students' mental well-being on stress, remote learning burnout, and the frequency of substance use. The analyses confirmed significantly higher levels of stress, remote learning burnout, and more frequent cigarette smoking among students with low mental well-being (H1). Negative correlations were revealed between students' mental well-being and the levels of school-related stress, burnout, cigarette smoking, and more frequent interaction with addicted individuals (H2). At the same time, remote learning burnout positively correlated with smoking tobacco and marijuana, as well as alcohol consumption and binge drinking. Higher school-related stress, remote learning burnout, and more frequent cigarette smoking were significant predictors of lower mental well-being among students (H3). The obtained results empirically confirm the presented theoretical model of resources vs. educational demands (SD-R). The current research findings are also consistent with data obtained in the course of our own analyses. Strizhitskaya et al. (2018) confirmed negative relationships between mental well-being and perceived stress. The authors also revealed that emotional stability may be of significant importance for this relationship. Similarly, Kulawska (2019) demonstrated that in the group of variables explaining students' low mental well-being, there were intensified stress and weak social support. In

Tomaszek's (2020) research, academic burnout correlated with low life satisfaction (cognitive component of well-being) and a lack of happiness (affective component of well-being). The mechanism underlying the relationships mentioned above is closely related to the emphasized cognitive and emotional dysregulation in the latest BAT burnout model, i.e., systems crucial for effective coping with tension and stress (Schaufeli et al., 2020). Students with burnout syndrome, on one hand, exhibit a strong focus on their own shortcomings and failures, and on the other, they apply a rigid and ineffective pattern of response to experienced physical and emotional exhaustion. As a result, educational and interpersonal problems accumulate, fostering escape tendencies in the form of engaging in self-harming actions that reinforce their belief in their worthlessness, but also in the senselessness and purposelessness of their existence. In this context, it is worth recalling the significant associations of the "I have nothing to lose" attitude with a negative school climate, mental difficulties, and adolescents' engagement in health-harming behaviors (Harris et al., 2002). However, it should be noted that in the cited studies, this factor did not act in isolation from the characteristics of the school and family environment. The conducted research project was based on the resources vs. educational demands model in the student's environment (SD-R), where burnout is associated with self-sabotaging behaviors secondary to an increase in difficulties in coping with tasks arising from the social role played. In this model, health-harming behaviors can act indirectly through the burnout syndrome on the individual's health level. A direct pathway between risky behaviors and students' mental well-being is also possible, which was the subject of analysis in this study. It should be noted, however, that mental well-being can also be considered a specific personal resource, a factor protecting against engaging in risky behaviors. In this context, it is worth adding that the relationships between the measured constructs mostly have the character of a feedback loop, where the loss in one area of functioning (i.e., difficulties in functioning in the educational sphere) directly translates into dysfunction in the mental and behavioral spheres.

Research restrictions

The verification of the correlation hypotheses was based on cross-sectional measurements. This method of data collection allows for drawing conclusions about relationships between measured characteristics but excludes the possibility of making causal inferences. The collected data were self-descriptive, and in the case of measuring socially sensitive features, there might be a tendency to minimize the frequency of socially unacceptable behaviors. It is important to note that efforts were made to minimize the impact of this limitation through anonymous online surveys. The method of data collection, using a Google form shared with students

via a link provided by teachers, likely resulted in a group of surveyed individuals that was not very diverse in terms of measured characteristics, potentially influencing the distortion of the obtained results. For example, no statistically significant correlations were found between mental well-being and indicators of drug use. Another limitation was the lack of control over the level of measured variables before the Covid-19 pandemic, preventing conclusions about the increase or decrease in risky behaviors in the studied group.

Recommendations for prevention

In light of the results obtained, the long-standing postulate in the literature regarding the need to intensify psychoprophylactic interventions during adolescence has been confirmed. The data suggest that the needs of young people require not only a focus on psychoactive substances but also on the issues of modern technologies. This aligns with the view that traditional prevention methods, based on education, promotion of social skills, natural care, and the promotion of health and risk minimization interventions (Jankowiak, 2017), should be implemented “outside the school walls” (Głupczyk, 2022). In the context of this research, this means enriching the repertoire of support interventions with e-preventive strategies tailored to the specific functioning of youth in the virtual world. As Szempruch (2021) notes, current prevention strategies in schools are aimed at changing students (strengthening resources), the school and classroom environment (modifying behaviors of students and teachers toward cooperation, conducting health-promoting activities, and minimizing the risk of school environmental pathologization), and the local community (promoting and strengthening regulations limiting access to psychoactive substances). The demand to also consider the virtual environment as a significant area for preventing risky behaviors among youth is reflected in preventive strategies based on interactive teaching-learning models proposed by Ostaszewski (2019) for educational institutions. The author points out several types of strategies that can be included in programs for teenagers promoting healthy behaviors on the Internet. These are: (a) *cognitive preventive strategies* aimed at developing attitudes and norms. Regarding the e-learning environment, supportive actions should consider forms of using modern technologies that do not harm students’ health (regulating the time spent in front of the computer, balancing passive online activities with active ones, learning computer hygiene), and the health of other Network users (introducing norms regarding the rights and obligations of Network users; information about Internet-related threats); (b) *strategies that build a positive school climate* as a buffer against engaging in problematic behaviors by teenagers. In the context of e-school, attention should be paid to educational actions aimed at building positive relationships between students not only in the real world but also in the virtual one. Another significant challenge is teaching

methods to support students using modern technologies and counteracting digital exclusion from the class group; (c) *preventive strategy related to the psychosocial education of students*, focusing on the development of social and psychological competencies, including the development of self-regulation skills of cognitive and emotional processes, especially in the area of emotion control, cognitive control, and attention management. This suggestion is particularly important in the context of the e-school environment because research confirms significant difficulties for students in self-directing the knowledge acquisition process in the absence of direct teacher control; (d) *mentoring* related to building positive social relationships. E-mentoring of interpersonal skills should, on the one hand, involve the transmission of positive social behavior patterns in the virtual world, and on the other hand, point out inappropriate attitudes and behaviors such as trolling or online aggression; (e) *A strategy related to shaping the competencies of personnel implementing preventive actions*, such as teachers and other educational staff. The topics of psychoprophylactic workshops should also include aspects of the sense of belonging to the class group and the local community. Actions should not be limited only to the school environment but also to the family environment, positively influencing the relationships of adolescents with their parents and acting as a protective factor against engaging in risky behaviors, including the use of psychoactive substances.

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Netography

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