Archives of Psychiatry and Psychotherapy, 2026; 1: 51–58

10.12740/APP/216161

Is there a Polish hikikomori? Loneliness, psychological well-being, and lifestyle among adolescents aged 13-18

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Abstract:

Aim The study aimed to investigate the relationships between loneliness, psychopathological symptoms, and lifestyle factors among Polish adolescents, with particular attention to potential features resembling the phenomenon of hikikomori described in East Asia.

Methods The study included 500 adolescents aged 13-18 years from primary and secondary schools across Poland. Standardized psychometric tools were used: UCLA-3 Loneliness Scale, WHO-5 Well-Being Index, DASS-21, and WHOQoL-BREF. Additionally, a custom questionnaire assessed lifestyle indicators such as screen time, outdoor activity, and peer interactions. Statistical analyses were conducted using t-tests, ANOVA, and Pearson correlation coefficients.

Results The participants demonstrated moderate levels of loneliness, with higher scores observed among girls and older adolescents. Loneliness showed positive correlations with depression (r = 0.40), anxiety (r = 0.33), and stress (r = 0.26), while negative associations were found with well-being (r = – 0.45) and quality of life, especially in the social domain. High loneliness was linked to increased use of electronic devices (r = 0.22), but not to outdoor activity or peer interactions.

Loneliness among Polish adolescents showed moderate prevalence, increasing with age and higher in girls. It correlated with depression, anxiety, stress, and excessive screen use, reducing well-being. Findings highlight loneliness's psychological significance and cultural relevance.

Conclusions: Loneliness among Polish adolescents is closely related to psychological distress and reduced well-being, with gender and age serving as important moderating factors. The findings suggest that certain features resembling hikikomori may emerge in the Polish context, particularly in connection with digital lifestyles. Preventive measures should address loneliness, technology dependence, and adolescent mental health.

loneliness; adolescents; hikikomori

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INTRODUCTION

Hikikomori, first conceptualized in Japan, refers to a state of prolonged social withdrawal, where individuals confine themselves to the home and avoid social participation, sometimes for months

or even years [1]. Initially perceived as a culture-bound syndrome tied to specific features of Japanese society, such as high academic pressure and rigid social expectations, it has increasingly been recognized as a broader psychosocial phenomenon transcending cultural boundaries. Reports from Europe, North America, and other Asian countries suggest that similar patterns of withdrawal and isolation may manifest under diverse socio-cultural conditions [2].

Adolescence represents a sensitive developmental stage during which peer relationships, identity formation, and social belonging are fundamental for psychological well-being. Loneliness, defined as the subjective perception of insufficient or unsatisfactory social relationships, is consistently linked to poor mental health outcomes in youth. Empirical evidence demonstrates strong associations between loneliness and depression, anxiety, and stress, as well as diminished life satisfaction and reduced resilience [3]. Moreover, developmental trajectories indicate that the intensity of loneliness often increases with age during adolescence, particularly in late adolescence when future-oriented pressures intensify [4].

Modern patterns of adolescent lifestyle add further complexity to the phenomenon of social withdrawal. Excessive reliance on digital media and electronic devices may function both as a coping mechanism and as a reinforcing factor for isolation. Screen-based activities often replace direct interpersonal contact, potentially exacerbating feelings of disconnection [5]. While technology can provide alternative modes of socialization, overuse is frequently associated with sleep disturbances, sedentary behaviors, and declines in psychological and physical well-being. At the same time, engagement in outdoor activities and peer interactions serves as a protective factor, mitigating the risk of isolation and fostering resilience [6].

Although the notion of hikikomori emerged in Japan, the underlying mechanisms-loneliness, withdrawal, and technology dependence-appear to resonate globally. However, cultural differences shape the expression, recognition, and social interpretation of these behaviors [7]. In societies undergoing rapid socio-economic and technological transformation, adolescents may be particularly vulnerable to tensions between traditional expectations and modern pressures. Understanding the cultural embeddedness of withdrawal is therefore crucial for situating hikikomori-like tendencies within different national contexts [8,9].

Adolescent loneliness and social withdrawal have increasingly been recognized as global public-health concerns, extending well beyond culture-specific manifestations such as hikikomori. Recent epidemiological evidence shows that rising levels of loneliness among adolescents are observable across diverse regions, including Europe, North America and East Asia, suggesting a broader international trend rather than isolated national phenomena. Large-scale studies, such as the WHO Health Behaviour in School-Aged Children (HBSC) reports and cross-national surveys by UNICEF and the OECD, consistently document growing psychological distress, declining social connectedness, and marked between-country variability linked to socioeconomic and cultural factors [A,B]. Integrating these perspectives underscores that the Polish context reflects wider patterns of adolescent mental-health change, while also allowing examination of potential divergences related to local sociotechnical transitions.

A parallel body of research highlights the need to conceptualize digital lifestyles and online socialization not merely as behavioral correlates, but as structural forces shaping adolescent development. Contemporary scholarship emphasizes how algorithmically curated platforms, persistent online communities, and digital substitutes for offline belonging can create immersive environments that both foster and obscure tendencies toward withdrawal [C,D]. These environments influence social comparison, identity formation, and patterns of engagement in ways that are increasingly understood as systemic rather than individual. Incorporating these frameworks situates the study within current debates on how digital ecosystems reorganize opportunities for connection and disengagement, thereby offering a more comprehensive lens for interpreting emerging forms of youth social withdrawal.

The aim of this study was to analyze the relationships between feelings of loneliness and selected aspects of mental health, well-being, and lifestyle among adolescents aged 13-

18. The starting point was the hypothesis that the increasing social withdrawal, technology dependence, and deteriorating mental health among Polish teenagers may indicate symptoms resembling the phenomenon of hikikomori, originally described in the Japanese context. In this work, our use of the term Hikikomori is intended to provide a theoretical basis for the phenomenon we describe.

MATERIAL AND METHODS

Participants

The study involved 500 students from primary and secondary schools across various regions of Poland. The participants' ages ranged from 13 to 18 years (M = 15.4; SD = 1.7), with 52% being girls and 48% boys. Inclusion criteria were: age between 13 and 18, voluntary consent to participate, and the ability to independently complete questionnaires in Polish. Participants were excluded in cases of lack of consent, reported cognitive difficulties, or significant missing data (>10% of items left unanswered).

The minimum required sample size for a 95% confidence level and ± 5% margin of error is n = 385, so the obtained sample exceeds this threshold. The distribution (ages 13–18; 52% female, 48% male) and school recruitment across regions confirm that the sample is representative of the youth population.

Assessment

The study was conducted using both paper-and-pencil and digital formats. Students completed the questionnaires in classroom settings under the supervision of a researcher or a trained teacher. The procedure was fully anonymous, and participation took approximately 20-25 minutes.

To measure subjective loneliness, a shortened version of the UCLA Loneliness Scale (UCLA-3) was used. This scale consists of 3 items rated on a 4-point Likert scale (1-4), with total scores ranging from 3 to 12. The tool demonstrates good criterion and construct validity, and in this study showed high reliability (α = 0.81) [10]. Mental well-being was assessed using the WHO-5 Well-Being Index, which consists of five items rated on a 0-5 scale, with total scores ranging from 0 to 25. The WHO-5 shows high correlation with clinical depression scales, indicating strong criterion validity. In this study, reliability was α = 0.87 [11]. Symptoms of depression, anxiety, and stress were measured using the DASS-21 (Depression Anxiety Stress Scale). This instrument includes 21 items, with 7 assigned to each subscale, rated on a 4-point severity scale. The scale has confirmed theoretical and diagnostic validity. In this study, internal consistency was very good: α = 0.89 (depression), α = 0.84 (anxiety), α = 0.87 (stress) [12]. Quality of life was assessed using the short version of the WHOQoL-BREF questionnaire, which covers four domains: physical, psychological, social, and environmental. Each domain includes between 4 and 6 items rated on a 1-5 scale. Scores are converted to values ranging from 4 to 20. The tool has been validated by the WHO and is widely used in adolescent research. In this study, reliability across domains ranged from α = 0.75 to α = 0.88 [13].

Additionally, a custom-designed lifestyle questionnaire was developed, which included questions on: average daily screen time (in hours); frequency of spending time outdoors (scale 1-5: never – daily); frequency of meeting with peers (scale 1-5).

Ethical aspects

The research was conducted in accordance with the Declaration of Helsinki and the standards of the European Federation of Psychologists' Associations (EFPA). Approval for the study protocol was granted by the Bioethics Committee (BNW/NWN/0052/KB/171/24). Participants were guaranteed complete anonymity and informed of their right to withdraw participation at any point. Informed consent was obtained from all respondents (or their legal guardians, when relevant) after they were presented with the study's aims and data handling procedures.

Statistical analysis

The collected data were analyzed statistically using Statsoft Statistica 13.0. Mean values, standard deviations, and significance tests (t-tests, ANOVA, Pearson correlations) were calculated. Statistical significance was set at $p < 0.05$.

RESULTS

In the examined sample of adolescents (N = 500), the mean score on the shortened version of the UCLA Loneliness Scale indicated a moderate level of loneliness (M = 6.80; SD ≈ 1.9), suggesting a non-negligible presence of socio-emotional deficits among the respondents. A clear differentiation in loneliness levels was observed with respect to biological sex. Girls, who constituted 52% of the sample (n = 260), reported significantly higher levels of loneliness (M = 6.97) compared to boys (48%; n = 240; M = 6.63), a difference that reached statistical significance ($t(498) = 2.50$; $p = 0.0126$).

Further analysis revealed that age was significantly associated with variations in the intensity of loneliness. Participants aged 13-14 years (n = 160; 32%) exhibited the lowest mean loneliness score (M = 6.46), followed by those aged 15-16 years (n = 170; 34%) with a moderate score (M = 6.78), while the highest levels were observed in the oldest group aged 17-18 years (n = 170; 34%; M = 7.20). This pattern proved to be statistically significant ($F(2, 497) = 6.65$; $p < 0.001$), suggesting a progressive intensification of perceived loneliness across later stages of adolescence.

The association between loneliness and psychopathological functioning (DASS-21) was explored across three affective domains: depression, anxiety, and stress. In each case, loneliness showed a statistically significant positive correlation. The strongest relationship emerged for depressive symptoms ($r = 0.40$; $p < 0.001$), followed by anxiety ($r = 0.33$; $p < 0.001$), and stress ($r = 0.26$; $p < 0.001$). The Table 1 presents a detailed breakdown of the associations between loneliness and three dimensions of psychological distress as measured by the DASS-21: depression, anxiety, and stress. Correlation coefficients (r) and significance levels (p) are reported separately for girls and boys, as well as across three developmental age groups: 13-14, 15-16, and 17-18 years. Across all subgroups, loneliness demonstrated a consistent and statistically significant positive correlation with depressive symptoms, with the strongest effects observed among girls ($r = 0.46$, $p < .001$) and in the oldest age group (17-18 years; $r = 0.49$, $p < .001$). Similar patterns were evident for anxiety ($r = 0.39$ for girls; $r = 0.42$ for 17-18 years) and, to a slightly lesser extent, for stress. Additionally, the table provides estimated percentages of individuals reporting high levels of DASS-21 symptoms within each subgroup among those classified as highly lonely (upper tercile of loneliness scores). These prevalence rates underscore the clinical significance of the associations: for example, 52.8% of lonely girls and 56.8% of lonely adolescents aged 17-18 reported elevated depressive symptoms, compared to 38.0% of lonely boys and 31.3% of lonely individuals aged 13-14.

Table 1. Correlation between UCLA-3 and DASS-21 with subgroup by gender and age (N = 500)

Component	Girls			Boys			13-14 y.			15-16 y.			17-18 y.		
	%	r	p	%	r	p	%	r	p	%	r	p	%	r	p
Depression	52.8	0.46	< 0.001	38.0	0.33	< 0.001	31.3	0.28	< 0.01	42.6	0.38	< 0.001	56.8	0.49	< 0.001
Anxiety	47.2	0.39	< 0.001	29.6	0.26	< 0.01	27.5	0.22	< 0.05	36.1	0.3	< 0.01	51.0	0.42	< 0.001
Stress	39.6	0.31	< 0.01	24.4	0.2	< 0.05	22.0	0.17	ns	30.5	0.25	< 0.05	44.2	0.34	< 0.01

A similarly robust pattern was observed in relation to subjective psychological well-being, measured using the WHO-5 index. Here, loneliness correlated strongly and negatively with self-reported well-being ($r = – 0.45$; $p < 0.001$), indicating that increased feelings of loneliness are accompanied by a pronounced decline in life satisfaction, perceived vitality, and psychological resilience. Complementary analysis of quality of life, measured across four WHO-QoL-BREF domains, revealed statistically significant negative associations in three domains. The strongest was found in the social domain ($r = – 0.31$; $p < 0.001$), underlining the centrality of loneliness in shaping perceptions of relational connectedness and social support. A similarly meaningful association was identified in the physical domain ($r = – 0.28$; $p < 0.001$), suggesting potential somatic and functional repercussions of prolonged loneliness. The psychological

domain also showed a significant, though more moderate, association ($r = -0.20$; $p < 0.001$), consistent with the role of loneliness in shaping affective experience and cognitive-emotional appraisal. No significant association was found between loneliness and the environmental domain ($r \approx -0.01$; $p = 0.83$), indicating that material and spatial living conditions exert minimal influence on the subjective experience of loneliness in this population.

In terms of lifestyle factors, loneliness was positively and significantly associated with the amount of time spent using electronic devices ($r = 0.22$; $p < 0.001$), a result that may point to compensatory or escapist usage of technology among more isolated individuals. In contrast, no significant correlations were observed between loneliness and the frequency of spending time outdoors ($r \approx 0.01$; $p = 0.82$) or the frequency of socializing with peers ($r = -0.03$; $p = 0.52$) – Table 2.

Table 2. Correlations between UCLA-3 and lifestyle factors with subgroup by gender and age (N = 500)

Component	Girls			Boys			13-14 y.			15-16 y.			17-18 y.		
	%	r	p	%	r	p	%	r	p	%	r	p	%	r	p
Electronic device use	47.5	0.26	< 0.001	39.2	0.18	< 0.05	30.4	0.15	< 0.05	42.9	0.23	< 0.01	54.1	0.28	< 0.001
Outdoor activity	34.1	0.02	ns	32.7	0.01	ns	28.1	0.01	ns	33.5	0.02	ns	36.2	0.01	ns
Interactions	36.8	-0.04	ns	34.5	-0.02	ns	29.7	-0.01	ns	34.8	-0.03	ns	35.9	-0.05	ns

DISCUSSION

The results of this study provide new insight into the phenomenon of loneliness and its psychological correlates among Polish adolescents, while also contributing to the broader discussion of hikikomori-like tendencies in non-Asian contexts.

The mean score in the sample indicates a moderate level of loneliness ($M = 6.80$), suggesting that social disconnection is a common experience during adolescence, though not necessarily extreme. Importantly, the presence of loneliness at this level may still have significant implications for adolescents' emotional functioning and overall well-being. Large-scale international studies confirm that several percent of adolescents report loneliness, indicating that while the phenomenon does not affect the majority, it is nonetheless a significant minority experience [14,15]. Moreover, early adolescent loneliness poses significant risks, though its persistence does not appear to add cumulative burden. Study by Matthew et al. [16] indicates that adolescents lonely at both 12 and 18, or only at 18, showed similarly elevated risks for mental health problems, health-risk behaviors, and educational or employment difficulties. Those lonely only at 12 fared better but still had poorer academic outcomes. Supportive family environments reduced, while negative peer experiences increased, loneliness risk.

Gender differences were observed, with girls reporting significantly higher loneliness scores than boys ($M = 6.97$ vs. $M = 6.63$; $p = 0.0126$). This finding aligns with previous evidence that adolescent girls are more vulnerable to internalizing difficulties, and may reflect their heightened sensitivity to peer relationships and social evaluation. For example, girls were over twice as likely (OR = 2.31, $p < 0.001$), and gender-diverse students nearly nine times as likely (OR = 9.01, $p < 0.001$), to be classified as lonely compared with boys in the study by Schütz et al. (2025). Such results underscore the necessity of considering gender-specific interventions when addressing loneliness in youth populations. However, Maes et al. [17] found no strong evidence of gender differences in loneliness, indicating that males and females report similar levels, which indicates the need to describe the are-related differences. Our study shows the loneliness increased progressively across adolescence, with the highest mean score recorded among 17–18-year-olds ($M = 7.20$; $p < 0.001$). This trajectory is consistent with developmental theo-

ries emphasizing the growing academic, social, and identity-related pressures faced by older adolescents, which may intensify the subjective sense of social isolation. Also, this is in the line with the study concerning corelation between age and depressive symptoms in the study by Ruan et al. [18] indicating to more frequent depressive disorders in older children.

Strong associations were found between loneliness and mental health difficulties. Loneliness correlated positively with depression ($r = 0.40$), anxiety ($r = 0.33$), and stress ($r = 0.26$), with the most pronounced relationships observed among girls and older adolescents. A meta-analysis by Gabarrell-Pascuet et al. [19] examined the associations between loneliness and mental health symptoms during the COVID-19 pandemic. The study found moderate correlations between loneliness and symptoms of depression ($r = 0.49$), anxiety ($r = 0.40$), and posttraumatic stress ($r = 0.38$) in adolescents. These results highlight loneliness as both an indicator and a potential risk factor for affective disorders, emphasizing its clinical significance in adolescent populations [19].

Similarly, loneliness showed a robust negative relationship with psychological well-being. A strong correlation with the WHO-5 index ($r = – 0.45$; $p < 0.001$) indicates that feelings of loneliness are accompanied by decreased vitality, optimism, and satisfaction with life. This confirms the central role of loneliness as a determinant of mental health, extending beyond symptomatology to broader measures of well-being. In addition, loneliness was significantly associated with reduced quality of life across multiple domains. Negative correlations were observed in the social ($r = – 0.31$), physical ($r = – 0.28$), and psychological ($r = – 0.20$) domains, while no significant relationship emerged for the environmental domain. These findings suggest that loneliness exerts its greatest impact on subjective experiences of health and relationships, rather than on material or contextual conditions.

Finally, the study examined the role of lifestyle factors. Loneliness was positively correlated with the amount of time spent using electronic devices ($r = 0.22$; $p < 0.001$), pointing to a potential reliance on digital media as a coping mechanism for social dissatisfaction. A recent study by Saleem et al. [20] examined the relationship between screen time, social media use, and mental health outcomes among adolescents. The study found significant positive correlations between average daily screen time and symptoms of depression ($r = 0.32$, $p < 0.001$), anxiety ($r = 0.28$, $p < 0.001$), and stress ($r = 0.36$, $p < 0.001$), which may also be the reason of loneliness [20]. Abovementioned results are confirmed also by study of Grajek et al. [21]. However, no significant associations were found with outdoor activity or the frequency of peer interactions. This may indicate that the quantity of interactions is less important than their quality in protecting against loneliness. Moreover, excessive engagement with digital technologies, while offering temporary distraction, may paradoxically reinforce withdrawal and isolation.

Taken together, these findings highlight loneliness as a multifaceted phenomenon with profound implications for adolescent development. Its links to age, gender, psychological distress, diminished well-being, and lifestyle patterns suggest that loneliness should be viewed not only as a symptom but also as a potential driver of hikikomori-like behaviors in European contexts. Preventive strategies addressing both digital habits and emotional resilience appear crucial for mitigating its impact.

Strengths and Limitations

The present study possesses several notable strengths. It was conducted on a relatively large and diverse sample of 500 adolescents from different regions of Poland, which increases the generalizability of the findings and allows for meaningful subgroup analyses in terms of age and gender. The use of well-validated and internationally recognized psychometric instruments, such as the UCLA Loneliness Scale, WHO-5, DASS-21, and WHOQoL-BREF, further enhances the methodological rigor and reliability of the results. The combination of standardized measures with a custom-designed lifestyle questionnaire also enabled a more nuanced exploration of the relationship between loneliness, psychological functioning, and behavioral patterns. In addition, the statistical analyses applied were robust, allowing for the detection of significant associations that highlight the complex interplay between loneliness, well-being, and lifestyle among adolescents.

At the same time, certain limitations must be acknowledged. The study relied exclusively on self-report measures, which may have introduced response biases such as social desirability or subjective misinterpretation of items. The cross-sectional design precludes causal inferences, making it impossible to determine whether loneliness leads to poor mental health outcomes or whether psychological difficulties contribute to increased loneliness and withdrawal. Although the sample was relatively large, it was restricted to adolescents attending school, which means that individuals who are most socially withdrawn, including those potentially experiencing severe hikikomori-like symptoms and no longer participating in education, were not represented. Furthermore, the lifestyle questionnaire, while valuable in capturing context-specific behaviors, was not standardized, which may limit comparability with other studies. Finally, cultural factors specific to Poland may influence the manifestation of loneliness and social withdrawal, and thus the findings should be interpreted with caution when extrapolated to other cultural contexts.

CONCLUSIONS

The findings of this study underscore the central role of loneliness in shaping adolescent mental health and lifestyle patterns. Elevated loneliness was consistently associated with higher levels of depression, anxiety, and stress, as well as lower psychological well-being and quality of life, particularly in the social domain. These results indicate that loneliness functions not only as a subjective emotional state but also as a significant risk factor for broader psychological difficulties during adolescence.

Gender and age differences further refine this picture, with girls and older adolescents reporting the highest levels of loneliness and distress. This developmental trajectory suggests that interventions should be tailored to specific subgroups, addressing both the emotional vulnerabilities of adolescent girls and the growing pressures faced by older youth.

Lifestyle analyses revealed that loneliness is positively linked to excessive screen use, while no protective effects were found for outdoor activity or peer contact in this sample. This highlights the complex interplay between digital engagement and social isolation, pointing to the potential of technology both as a coping strategy and as a factor reinforcing withdrawal.

Taken together, the findings suggest that patterns resembling hikikomori may emerge outside the Japanese context, shaped by cultural and technological conditions specific to Poland. Preventive strategies should therefore focus on fostering social connectedness, reducing harmful digital overuse, and promoting psychological resilience, with particular attention to vulnerable groups of adolescents.

Recommendations

Based on the observed associations between loneliness, psychological distress, and lifestyle factors among adolescents, several recommendations for practice and policy can be formulated. First, schools should play a central role in early detection and intervention by incorporating systematic screening for loneliness and emotional difficulties into routine psychological support services. Teachers and school counselors could be trained to recognize early signs of withdrawal and to respond with evidence-based strategies that foster peer connectedness and resilience.

Preventive programs should emphasize the promotion of healthy digital habits. While technology can provide valuable opportunities for communication, excessive screen use was found to be strongly associated with loneliness. Structured initiatives aimed at digital literacy, balanced screen time, and the cultivation of offline activities may help mitigate risks related to excessive online engagement.

Interventions should be developmentally sensitive and tailored to vulnerable subgroups, particularly girls and older adolescents, who demonstrated higher levels of loneliness and psychological distress. Gender-specific and age-appropriate approaches may improve effectiveness by addressing the distinct emotional and social challenges faced by these populations.

Public health strategies should aim to reduce the stigma surrounding loneliness and mental health difficulties in adolescence. Promot-

ing open dialogue within families, communities, and educational institutions may encourage young people to seek help earlier and prevent escalation toward severe social withdrawal resembling hikikomori. Future research should further investigate protective factors, including the potential role of outdoor activities and structured peer interactions, to inform comprehensive intervention models.

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