Scientific Reports

https://doi.org/10.1038/s41598-026-53567-4

Article in Press

A cluster analysis of psychosocial risk and hidden distress in adolescent students

Received: 17 March 2026

Accepted: 13 May 2026

Published online: 20 May 2026

Cite this article as: Íñiguez-Berrozpe T., Marcaletti F., Elboj-Saso C. *et al.* A cluster analysis of psychosocial risk and hidden distress in adolescent students. *Sci Rep* (2026). https://doi.org/10.1038/s41598-026-53567-4

Tatiana Íñiguez-Berrozpe, Francesco Marcaletti, Carmen Elboj-Saso & Ana Cebollero-Salinas

A Cluster Analysis of Psychosocial Risk and Hidden Distress in Adolescent Students

Tatiana Íñiguez-Berrozpe, Department of Psychology and Sociology. Faculty of Education, University of Zaragoza, Pedro Cerbuna, 12, 50009, Zaragoza, Spain. tatianai@unizar.es. Telephone: (+34) 976 76 10 00 Ext. 84 48 31 .

Francesco Marcaletti, Department of Psychology and Sociology. Faculty of Social Sciences, University of Zaragoza, Violante de Hungría, 50009 (Zaragoza, Spain). fmarcaletti@unizar.es

Carmen Elboj-Saso, Department of Psychology and Sociology. Faculty of Education, University of Zaragoza, Pedro Cerbuna, 12, 50009 (Zaragoza, Spain). celboj@unizar.es

Ana Cebollero-Salinas, Department of Educational Sciences. Faculty of Education, University of Zaragoza, Pedro Cerbuna, 12, 50009 (Zaragoza, Spain). anacebollero@posta.unizar.es

Corresponding authors: Tatiana Íñiguez-Berrozpe and Ana Cebollero-Salinas

Abstract

Adolescent mental health problems and suicidal vulnerability have become major public health concerns, requiring more nuanced approaches to the identification of psychosocial risk. This study explores the diversity of adolescent distress from a psychosocial perspective, through a cluster analysis based on indicators of emotional well-being, social ties and mental health. Using data from 1,975 adolescents (aged 11–18), four profiles were identified that combine variables such as loneliness, suicidal ideation, social self-esteem, bullying, emotional regulation, and problematic internet use. The results reveal a particularly worrying profile, characterised by high levels of suicidal ideation despite average levels of social adjustment, suggesting the existence of invisible emotional distress. Another profile stands out for its psychosocial resilience, while the remaining two express distress through conflict or relational and emotional vulnerability. These findings underscore the need for multidimensional detection strategies and differentiated interventions that transcend visible symptoms to prevent mental health risks in adolescence.

Keywords: adolescence; psychosocial distress; suicidal ideation; loneliness; cluster analysis; bullying; problematic internet use

Introduction

Psychosocial distress in adolescence is a multidimensional phenomenon expressed through interconnected affective, relational, and behavioural processes. As adolescents navigate major biological, cognitive, and social changes, emotional vulnerability increases (Steinberg, 2014; Eccles & Roeser, 2011). Distress may

manifest through internalising symptoms (e.g., anxiety and depression) or externalising behaviours (e.g., aggression and interpersonal conflict) (Rescorla et al., 2007). This has led to a distinction between visible and invisible distress (Sánchez-García et al., 2018). Visible distress is typically observable in disruptive behaviours and conflicts, often prompting intervention in schools and families, and is commonly linked to emotion-regulation difficulties and conflictive relational contexts (Eisenberg et al., 2010). Invisible distress, by contrast, includes loneliness, suicidal ideation, and emotional isolation that may remain undetected because it lacks overt behavioural markers (Matthews et al., 2019). This is particularly concerning, as delayed identification can contribute to severe outcomes, including depressive disorders, self-harm, and suicide (Loades et al., 2020).

Gender differences are also relevant in adolescent psychosocial distress, as girls more often show internalising patterns linked to loneliness, anxiety, depressive symptoms, and suicidal ideation, whereas boys are more likely to display more externalising manifestations of distress or higher rates of suicide (Maes et al., 2019; Miranda-Mendizabal et al., 2019).

Loneliness—social, familial, or emotional—has been consistently associated with higher suicidal ideation, especially when perceived social support is low (Bendezú et al., 2022; Kennedy & Brausch, 2024). Bullying, cyberbullying, problematic internet use (PIU), and difficulties in emotional and relational functioning may further intensify vulnerability, although these processes do not necessarily operate linearly or in the same way for all adolescents (Keles et al., 2020; Yang et al., 2023). Accordingly, integrating affective, relational, and behavioural indicators through profile-based methodologies such as cluster analysis can improve prevention and intervention strategies (Cohen et al., 2021; Dolnicar & Grün, 2022). Recent cluster-based evidence further supports the idea that adolescent mental health needs are heterogeneous and not adequately captured through one-size-fits-all approaches (Delaney et al., 2024).

In this study, we apply cluster analysis to standardised indicators of emotional well-being, social bonds, and mental health in 1,975 adolescents (aged 11–18), identifying four profiles combining loneliness (general, social, and family), suicidal ideation, social self-esteem, bullying, emotional regulation, and PIU. From a youth studies perspective, these patterns should be understood as emerging within everyday institutional and peer contexts—especially schools—and within digitally mediated youth cultures that shape belonging, recognition, and exposure to harm. Mapping psychosocial profiles can therefore inform proportionate, context-sensitive responses that go beyond individualised and behaviour-led identification.

Theoretical framework

Unwanted loneliness and suicidal ideation: between isolation and hidden suffering

Unwanted loneliness and suicidal ideation are particularly severe manifestations of psychosocial distress in adolescence. Evidence suggests that both function as markers of vulnerability and that their association is not always linear (Loades et al., 2020; Barreto et al., 2021). Unwanted loneliness—defined as the discrepancy between desired and perceived relationships (Qualter et al., 2015)—can be social,

familial, or emotional. Cross-cultural research indicates that these phenomena occur across contexts, although their expression varies (Biswas et al., 2020). Gender also matters: girls more often internalise loneliness (e.g., depressive symptoms), whereas boys tend to externalise distress, frequently through disruptive behaviour (Maes et al., 2019).

Emotional loneliness appears most closely linked to suicidal ideation, even after controlling for depression (Lasgaard et al., 2011; Matthews et al., 2019), and longitudinal studies show that loneliness predicts increases in suicidal ideation over time (Shoib et al., 2023). This vulnerability is gendered: girls typically report higher suicidal ideation, while boys show higher rates of suicide (Miranda-Mendizabal et al., 2019; Campisi et al., 2020). Theoretically, learned helplessness frameworks posit that chronic loneliness fosters helpless cognitions (Abramson et al., 1989, Liu et al., 2015), and neuroscientific findings indicate heightened reactivity to social rejection among lonely adolescents (Masten et al., 2011). Loneliness also mediates the relationship between social anxiety and suicidal ideation (Gallagher et al., 2014). Although correlated with depression, loneliness may not independently predict it in all cases, yet it can exacerbate depressive processes and thereby elevate suicide risk (Lasgaard et al., 2011).

Recent umbrella-review evidence also underscores that adolescent suicidal behaviour is shaped by interacting individual, interpersonal, and broader socioecological factors, including emotional dysregulation, loneliness, and family and peer relationships (Prades-Caballero et al., 2025). In this context, protective relational resources become especially relevant. Friendship satisfaction predicts fewer internalising symptoms (Gómez-López & Viejo, 2022), and supportive bonds at school and within the family play a similar role (Marques et al., 2021; Valois et al., 2023). Reciprocal, trusting friendships can reinforce self-esteem and buffer daily stress, whereas dissatisfaction is associated with rejection, withdrawal, emerging suicidal ideation, and cyberbullying (Piazuelo-Rodríguez et al., 2023). Overall, evidence also suggests bidirectionality: relationships shape distress, and distress can erode relationship quality, making loneliness and suicidal ideation a critical public health challenge in adolescence.

Risk modulating factors: self-esteem, emotional skills, and social conflicts

Beyond loneliness and suicidal ideation, adolescent psychosocial distress is also shaped by personal, relational, and digital factors that may either mitigate or intensify risk. Research points to key modulators, including self-esteem, social/emotional skills, and interpersonal conflict such as bullying and cyberbullying, as well as appearance-based social comparison processes intensified by problematic internet use (Álvarez-Quiroz et al., 2023; Arrivillaga et al., 2020; Quintana-Orts et al., 2025).

Self-esteem is central to adolescent psychosocial wellbeing. Adolescents with higher self-esteem tend to build more secure peer bonds and a sense of belonging that buffers isolation (Nuñez Fadda et al., 2023). Conversely, negative self-perceptions may lead adolescents to interpret ambiguous interactions as rejection, increasing sensitivity to rejection and social anxiety (Zimmer-Gembeck et al., 2021). These dynamics are closely intertwined with bullying: low self-esteem is associated with greater victimisation, and victimisation further increases rejection and isolation, eroding social self-esteem and creating a reinforcing cycle (Alvarez-

Quiroz et al., 2023). Low self-esteem also mediates the link between bullying and adverse psychological outcomes, intensifying emotional vulnerability (Balluerka et al., 2023).

Social/emotional skills represent another robust set of protective factors. Emotional regulation and emotional autonomy are linked to greater resilience under adversity (Quintana-Orts et al., 2025). Evidence suggests that intentionally cultivating these skills—both offline and online—can serve as a powerful intervention to address adolescent psychosocial distress (González-Gómez et al., 2024; authors 2024). School programmes that foster such competencies have been shown to reduce depressive symptoms and thoughts of self-harm (Liu & Wang, 2024). Emotional self-control also supports frustration tolerance and the modulation of impulsive responses, reducing the risk of withdrawal via digital escapism (Gaeta-González et al., 2025) and suicidal behaviour (Arrivillaga et al., 2020). In this sense, social/emotional skills do not merely buffer risk; they actively promote healthy development. Some authors further suggest gendered pathways in which emotional regulation is particularly salient for girls, while impulse control may be especially relevant for boys' adjustment (authors 2025).

Interpersonal conflict and lack of support further shape risk. Bullying encompasses different forms of interpersonal aggression, including exclusion, humiliation, and domination, which may intensify loneliness, social isolation, and broader psychosocial vulnerability (Gusqui et al., 2025). More broadly, limited support from family or peers is a critical vulnerability factor (Yang et al., 2023; Dickerson et al., 2022), as are interpersonal conflicts that intensify isolation and psychological distress (Marengo et al., 2021). Bullying and cyberbullying amplify these processes, particularly when low self-esteem or poor family support are present (Iranzo et al., 2019; Klomek et al., 2007), increasing the likelihood of suicidal thoughts (Li et al., 2022). A meta-analysis across more than 90 countries found that bullying victimisation and lacking close friends were associated with suicidal ideation among girls, whereas among boys, involvement in fights and lacking close friends were associated with suicidal ideation, along with serious injuries in early adolescence (Campisi et al., 2020).

Finally, the digital environment is ambivalent: social media can facilitate connection, yet it can also intensify social comparison, undermine self-esteem, and increase exclusion (Keles et al., 2020; Twenge et al., 2019; Orben et al., 2020). Herruzo et al. (2023) report higher risk of suicidal behaviour among adolescents with problematic internet use (PIU), with elevated risk estimates for both girls and boys. These processes may form a vicious circle: loneliness can prompt adolescents to seek validation online, heightening comparison and appearance concerns, worsening mood and self-esteem, and reinforcing technology use—ultimately increasing anxiety and suicidal ideation (Papapanou et al., 2023). Relatedly, adolescent stress mediated by PIU and low emotional regulation has been proposed as another pathway elevating suicide risk (Chamarro et al., 2024). Recent meta-analytic and longitudinal evidence has reinforced the association between problematic internet use and suicidal behaviours in adolescents, including suicidal ideation, plans, and attempts (He et al., 2024; Fukuya et al., 2025).

Heterogeneity of adolescent distress profiles

Traditionally, research on suicidal ideation has examined risk factors in isolation—such as depression, substance use, bullying, or family conflict. Although informative, this approach is limited because adolescent risk processes rarely operate independently. Increasingly, studies have adopted profile-oriented methods, including clustering, to capture how multiple risks and protections combine within individuals (Ling et al., 2016). By grouping adolescents into empirically derived profiles, these approaches reveal meaningful configurations that are not apparent in analyses based on population averages (Dever et al., 2017). Such tools can offer a more clinically relevant perspective, supporting detection and intervention strategies tailored to the needs of specific risk groups (Menéndez et al., 2021).

Across prior profile research, differentiation between groups tends to rely on three interrelated domains: psychological factors (e.g., depressive/anxious symptoms), relational factors (e.g., family climate and school integration), and clinical-history indicators (e.g., self-harm or previous attempts). Empirical studies link suicidal ideation to a wide set of psychological vulnerabilities, including low self-esteem (De la Hoz-Granadillo et al., 2023), limited digital parental supervision (López-Villalobos et al., 2025), and emotional/behavioural problems (Fonseca-Pedrero et al., 2018). Relational risks also feature prominently, including disrupted family communication (De la Hoz-Granadillo et al., 2023), bullying (Cañon Buitrago et al., 2018), relationship problems (Jiménez et al., 2024), and combinations of low socio-economic status with peer difficulties (Choi et al., 2024). Other work highlights the contribution of clinical and lifestyle-related correlates, such as trauma history and multiple comorbidities (King et al., 2014), frequent consumption of soft drinks and fast food (Zhan et al., 2024), and unhealthy patterns of physical activity, diet, sleep, and screen use (Xiao et al., 2019). In Spain, Castro Castañeda and Vargas Jimenez (2022) integrated individual (self-concept, life satisfaction), family (open and offensive parental communication), and school variables (involvement, belonging, teacher support). Their findings show that adolescents with versus without suicidal ideation differ on multiple self-concept dimensions, life satisfaction, open communication with parents, teacher support, and school belonging; notably, offensive communication between mother and father most strongly distinguished the high-ideation group.

Overall, these studies suggest that adolescent profiles of suicidal ideation often reflect both severity (low/moderate/high ideation) and the co-occurrence of emotional, behavioural, and social symptoms. For instance, Lee et al. (2023) identified four risk classes using indicators such as depression, anxiety, suicidal ideation, and planned/attempted suicide; the highest-risk class concentrated multiple psychosocial risks, including impulsivity, low self-esteem, self-harm, deviant behaviour, and child abuse.

Importantly, many young people remain undetected because they do not disclose suicide-related experiences (Page Spears et al., 2025). Evidence from 11 European countries (ages 14–17) identified an “invisible” risk group characterised by factors adults may not readily recognise as warning signs—high leisure use of the internet/TV/video games, sleep deprivation, and sedentary lifestyles (Carli et al., 2014). This group appeared with similar prevalence across ages and genders and was comparable in size to other high-risk groups (e.g., alcohol and drug use, more common among boys). Together, these findings underscore the need to refine

profile-based research to identify “invisible” risk constellations and inform earlier, more sensitive prevention strategies.

Objectives

The primary aim of this study was to identify distinct psychosocial profiles among adolescents using K-means cluster analysis based on standardised indicators of loneliness (general, social, and familial), suicidal ideation, depressive symptoms, social self-esteem, bullying/cyberbullying, socio-emotional skills, and problematic internet use. A secondary aim was to examine how these profiles differed in subjective well-being and key socio-demographic characteristics, with particular attention to gendered patterns of internalising and externalising distress.

Methods

Sample

The sample was drawn from school-going adolescents attending educational centres in Aragón, Spain. Recruitment was conducted through participating schools, and information letters were distributed to families to explain the study and request informed consent from parents or legal guardians in the case of minors.

The study sample consisted of 1,975 school-going adolescents aged between 11 and 18 years (M = 14.39; SD = 1.78). With regard to sex, 52% of participants were female and 47.1% were male. In terms of educational level, the students were distributed across different years of compulsory secondary education, “bachillerato” (final two years of secondary education leading to university studies) and previous educational levels (5th-6th year of primary education). Most were in the third year of compulsory secondary education (ESO) (22.9%), followed by the first year of bachillerato (18.1%), the first year of compulsory secondary education (17.8%), second year of ESO (17.0%), fourth year of ESO (13.5%) and vocational training (2.5%). A smaller proportion of students were in 5th and 6th year of primary school (5.8% and 2.4% respectively). In terms of perceived socio-economic background, 3.1% of participants self-identified as belonging to a low social class, 63.6% as middle class, and 19.45% as high social class, while 13.8% indicated that they did not know or preferred not to answer.

As this was an anonymous, school-based community study conducted under strict confidentiality safeguards, no individual clinical background data were collected on previous mental health diagnoses, psychological treatment, or therapeutic follow-up. Although the study included psychosocial, emotional, behavioural, and relational indicators, it did not include diagnostic or screening measures for neurodevelopmental conditions; consequently, such conditions were neither assessed nor used as exclusion criteria.

This study has been approved by the Research Ethics Committee of the Autonomous Community of Aragon (CEICA), in accordance with the favourable opinion issued on 12 March 2025 (File PI25/044). The research has been conducted in strict compliance with the ethical principles established in the Declaration of Helsinki and current national regulations on research involving human subjects. Strict procedures have been implemented to guarantee the

anonymity and confidentiality of the data, ensuring that no information allows for participants to be identified individually. Participation in the study was voluntary, subject to the signing of an informed consent form by families or legal guardians in the case of minors, and adolescents were provided with clear, understandable information about the objectives of the research, their rights as participants and the confidentiality guarantees.

Instrument and Procedure

The initial set of variables included more than 70 indicators distributed across key dimensions: life satisfaction (with family, friends, free time, finances and the future), quality of relationships (family, school and friendships), perception of bullying, self-image, loneliness (general, social and family), social self-esteem, social skills, problematic internet use and depressive symptoms. Family-related dimensions were assessed through adolescents' self-reports, including perceived family relationships, family satisfaction, and family loneliness. Indicators came from different instruments and response formats (e.g., some relational ratings used 5-point scales, whereas satisfaction items were rated on 0–10 scales), and all were therefore standardised to Z scores prior to clustering (mean = 0, standard deviation = 1). This transformation allowed all variables to contribute equally to calculating the distances between cases, preventing the dominance of those with greater original variance (Bodega et al., 2023).

The variables included in the cluster analysis were drawn from multiple questionnaire blocks and validated instruments covering key psychosocial domains relevant to adolescent distress. These domains included general, social, and family loneliness; suicidal ideation; depressive symptoms; bullying and cyberbullying victimisation; problematic internet use; social self-esteem; socio-emotional competences; emotional regulation; social goals; social skills; life satisfaction; and perceived family, peer, and school relationships. General loneliness was assessed with the six-item short form of the Revised UCLA Loneliness Scale (RULS-6) (Wongpakaran et al., 2020, in Ramos-Vera, et al., 2022), social loneliness with the social loneliness dimension of the ESTE scale (Cardona-Jiménez, et al. 2010), suicidal ideation with the Paykel Suicide Scale (Fonseca-Pedrero, et al. 2018), depressive symptoms with the depression subscale of the DASS-21 (Fonseca-Pedrero, et al., 2010), and problematic internet/mobile-related use with the Spanish Cuestionario de Experiencias Relacionadas con el Móvil (CERM) (Beranuy et al., 2009). Additional items captured online appearance concerns, internet-use motivations, and e-socioemotional competences. Because the cluster solution was built from a broad and heterogeneous pool of indicators drawn from different instruments and questionnaire blocks, the full list of variables, response formats, scoring procedures, and source measures is reported in the supplementary material.

To improve the model's efficiency and interpretability, a selection criterion based on the discriminatory capacity of each variable was applied. Variables were retained on theoretical and measurement grounds (i.e., coverage of core psychosocial domains and non-redundancy) before estimating the final clustering solution. The ANOVA F statistics reported in Table 1 are presented as a post hoc descriptive check of discriminatory capacity across the resulting clusters, rather than as a criterion used to define the clusters, performed on an initial set of

standardised indicators (Z scores). All the selected variables showed statistically significant differences between clusters ($p < .001$), and many of them had F values greater than 100, which guarantees a high robustness of the model (See Table 1). The decision to use Z scores is based on the need to standardise the measurement scales and facilitate interpretation of the resulting profiles. This strategy made it possible to maintain a diversity of relevant dimensions without overloading the model: with N = 1,975 and more than 30 cases for each of the four groups, the K-means technique achieves a separation between centroids that meets this objective (Dalmaijer, Nord & Astle, 2022).

Table 1: ANOVA of the variables included in the cluster analysis

	Cluster		Error		F	Sig.
	Quadratic mean	gl	Quadratic mean	gl		
v_7_1_family_satisfaction	118,742	3	0.819	1971	144,916	.000
v_7_3_satisfaction_with_friends	208,528	3	0.687	1971	303,320	.000
v_7_5_economic_satisfaction	74,527	3	0.888	1971	83,886	.000
v_9_3_friendship_relationships	179,405	3	0.730	1971	245,637	.000
v_12.1_B1_Someone_has_insulted_me	77,120	3	0.884	1971	87,232	.000
v_12.2_B2_Someone_has_told_other_women	139,811	3	0.794	1971	176,164	.000
v_12.3_B3_Someone_has_threatened_me	146,117	3	0.782	1971	186,796	.000
v_12.5_B5_I_have_been_excluded_or_ignored	198,103	3	0.701	1971	282,709	.000
v_12.6_B6_Someone_has_spread_rumours_about_me	133,736	3	0.802	1971	166,855	.000
v_13.1_CB1_Someone_has_used_offensive_language_towards_me_on_social_media	173,555	3	0.737	1971	235,527	.000
v_13.2__CB2_Someone_has_said_bad_things_about_me_to_others_on_social_media	217,494	3	0.666	1971	326,722	.000
v_13.3_CB3_Someone_has_threatened_me_on_social_media	282,600	3	0.572	1971	493,772	.000
v_13.4_CB4_Someone_has_hacked_my_account_and_stolen_my_personal_information.	328,654	3	0.484	1971	678,518	.000
v_13.5_CB5_Someone_has_hacked_my_account_and_impersonated_me	310,962	3	0.519	1971	598,864	.000

v_13.6_CB6_Someone_has_created_a_fake_account_pretending_to_be_me	308,033	3	0.521	1971	590,924	.000
v_13.7__CB7_Someone_has_posted_information_about_me_on_social_media	314,057	3	0.515	1971	609,826	.000
v_13.8__CB8_Someone_has_posted_videos_or_photos_without_my_permission_on_social_media	332,469	3	0.484	1971	686,947	.000
v_13.9_CB9__Someone_has_edited_photos_of_me_without_my_permission_on_social_media	315,682	3	0.509	1971	619,885	.000
v_13.10_CB10__I_have_been_excluded_or_ignored_on_social_media	224,208	3	0.654	1971	342,961	.000
v_13.11__CB11_Someone_has_spread_rumours_about_me_on_social_media	206,288	3	0.677	1971	304,752	.000
v_13.12__CB12_Someone_has_ridiculed_me_on_social_media	229,659	3	0.651	1971	352,657	.000
v_15_1_LONELINESS1_I_need_company	102,774	3	0.848	1971	121,236	.000
v_15_2_LONELINESS2_I_feel_lonely	208,472	3	0.687	1971	303,356	.000
v_15_3_LONELINESS3_I_don’t_feel_close_to_anybody	187,469	3	0.712	1971	263,265	.000
v_15_4_LONELINESS4_I_feel_excluded_by_others	225,769	3	0.663	1971	340,331	.000
v_15_5_LONELINESS5_I_think_that_nobody_really_knows_me_well	165,945	3	0.752	1971	220,642	.000
v_15_6_LONELINESS6_People_are_around_me_but_I_don't_feel_close_to_them	203,343	3	0.695	1971	292,659	.000
v_18_1__SI1_I_have_felt_that_life_is_not_worth_living	189,108	3	0.717	1971	263,841	.000
v_18_2__SI2_Have_you_ever_wished_you_were_dead,_like_to_go_to_sleep_and_not_wake_up?	194,053	3	0.705	1971	275,155	.000
v_18_3__SI3_Have_you_thought_about_taking_your_own_life_even_if_you_haven't_done_it	176,800	3	0.733	1971	241,160	.000
v_19_1_DEPRESSION1_I_could_not_feel_any_positive_emotions	162,185	3	0.755	1971	214,886	.000
v_19_2_DEPRESSION2_I_find_it_difficult_to_take_the_initiative_to_do_things	158,521	3	0.765	1971	207,309	.000
v_19_3_DEPRESSION3_I_felt_I_had_nothing_to_live_for	235,500	3	0.642	1971	366,716	.000
v_19_4_DEPRESSION4_I_felt_sad_and_depressed	241,775	3	0.637	1971	379,291	.000

v_19_5_DEPRESSION5_I_couldn't_get_excited_about_anything	187,102	3	0.720	1971	259,953	.000
v_19_6_DEPRESSION6_I_felt_that_I_was_worthless_as_a_person	273,765	3	0.589	1971	464,997	.000
v_19_7_DEPRESSION7_felt_that_life_had_no_meaning	265,510	3	0.600	1971	442,856	.000
v_26_1_EMOTIONAL_REGULATION1_When_I_want_to_increase_my_positive_emotions_(e.g._joy,_fun),_I_change_the_topic_I_am_thinking_about.	75,896	3	0.886	1971	85,662	.000
1_26_2_EMOTIONAL_REGULATION2_I_keep_my_emotions_to_myself_a						
v_26_4__EMOTIONAL_REGULATION4__When_I_am_feeling_positive_emotions,_I_am_careful_not_to_express_them	42,888	3	0.936	1971	45,809	.000
v_26_6_EMOTIONAL_REGULATION6_I_control_my_emotions_by_not_expressing_them	42,686	3	0.937	1971	45,578	.000
v_27_1_SOCIAL_SELF-ESTEEM1_make_friends_easily	86,620	3	0.870	1971	99,600	.000
v_27_2__SOCIAL_SELF-ESTEEM2_I_am_a_friendly_person	40,307	3	0.940	1971	42,872	.000
v_27_3__SOCIAL_SELF-ESTEEM3_It_is_not_difficult_for_me_to_make_friends	73,042	3	0.890	1971	82,037	.000
v_27_4__SOCIAL_SELF-ESTEEM4_I_am_a_cheerful_person	65,475	3	0.902	1971	72,600	.000
v_27_6__SOCIAL_SELF-ESTEEM_I_have_many_friends	94,677	3	0.857	1971	110,421	.000
Problematic_internet_use	70,261	3	0.894	1971	78,622	.000
V_16_1_INV_SocialLoneliness1_I_do_not_have_friends_with_whom_I_share_my_opinions	142,598	3	0.785	1971	181,576	.000
V_16_4_INV_SocialLoneliness4_I_don't_like_the_people_I_go_out_with	158,243	3	0.760	1971	208,240	.000
V16_5_INV_Social_Loneliness5_I_would_not_be_able_to_count_on_my_friends_if_I_needed_help	185,268	3	0.719	1971	257,653	.000
V17_2_INV_FamilyLoneliness2_My_family_does_not_support_me_in_my_decisions	83,418	3	0.871	1971	95,772	.000
V17_4_INV_SoledadFam4_I_don't_feel_accompanied_when_I'm_with_my_family	128,797	3	0.800	1971	161,067	.000

Analysis

The analysis was performed using the SPSS QUICK CLUSTER procedure in IBM SPSS Statistics, version 29 (IBM Corp., Armonk, NY, USA; available at https://www.ibm.com/products/spss-statistics) with the following specifications: Method: K-means; maximum number of iterations: 10; convergence; cases with missing data deleted by list (/MISSING=LISTWISE); saving the number of clusters and distance to the centroid for each case.

Solutions with two to six clusters were explored. To determine the optimal solution, the elbow method was used, graphing the evolution of the sum of squares within the cluster (Within-Cluster Sum of Squares, WSS) as a function of the number of groups (k). The corresponding elbow plot is presented in Supplementary Figure S1 and demonstrated an inflection at k = 4, with diminishing returns thereafter. This result, together with the more balanced case distribution and interpretability of the four-cluster solution, supported the selection of the four-cluster model.

The choice of the four-cluster solution is based on both statistical and interpretative criteria. On the one hand, it represents the optimal inflection point in the elbow method. On the other hand, it allows us to identify profiles with differentiated psychosocial significance: from adolescents with positive adjustment to groups with high levels of loneliness, depressive symptoms, and low self-esteem. The four-group solution therefore offers an adequate balance between explanatory parsimony, analytical clarity, and practical usefulness for designing differentiated interventions.

Table 2 presents the general descriptive characteristics of the four clusters, including cluster size, sex distribution, educational level, and distance-to-centroid indices, thereby providing additional context for the interpretation of the psychosocial profiles.

Table 2: Descriptive characteristics of the clusters: size, sex, and educational level

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
N	385	268	1173	149
Sex: Female	239 (62.1%)	172 (64.2%)	559 (47.7%)	54 (36.2%)
Sex: Male	142 (36.9%)	93 (34.7%)	610 (52.0%)	89 (59.7%)
Educational stage: Primary	24 (6.2%)	19 (7.1%)	106 (9.0%)	13 (8.7%)
Educational stage: Compulsory secondary	292 (75.8%)	199 (74.3%)	786 (67.0%)	122 (81.9%)
Educational stage: Upper secondary/vocational	69 (17.9%)	50 (18.7%)	281 (24.0%)	14 (9.4%)
Distance to centroid: Mean (SD)	6.98 (1.36)	7.57 (1.52)	5.20 (1.28)	7.99 (2.45)

Note. Percentages are calculated within each cluster. Distance to centroid values are reported as mean (SD). n = 1,975.

Results

The four-cluster solution yielded meaningful and sufficiently sized groups (Cluster 1: n = 385; Cluster 2: n = 268; Cluster 3: n = 1,173; Cluster 4: n = 149). All clustering variables were standardised (Z scores). Table 3 reports cluster means,

standard deviations, η^2, and omnibus tests; below we summarise the substantive interpretation of each profile.

Cluster 1 – Adjusted profile with hidden emotional risk. Cluster 1 is notable because it concentrates the highest level of suicidal ideation in the sample (Z = +0.86) without displaying the most extreme relational deterioration. Loneliness is above average (Z = +0.36), but markedly lower than in Cluster 2. Social self-esteem is around the sample mean (Z = +0.07), and relationships with peers are not strongly impaired. Victimisation is present but moderate: bullying is slightly above average (Z = +0.39) and cyberbullying is around the mean (Z ≈ 0.00). Socio-emotional functioning is subtly compromised—self-control (Z = −0.17), emotional autonomy (Z = −0.09) and regulation (Z = −0.04) are below average—indicating limited coping capacity in the face of stress. In the digital domain, problematic internet use (Z = +0.35) and appearance concerns (Z = +0.49) are above average. Relationships were generally not very negative, especially with friends (family relations Z = -0.26; friendships Z = 0.24), while satisfaction with studies was comparatively lower. In sum, Cluster 1 combines elevated suicidal ideation with moderate loneliness and a comparatively less deteriorated relational profile than the more vulnerable clusters.

Cluster 2 – High relational vulnerability. Cluster 2 reflects the most globally affected profile. Suicidal ideation is very high (Z = +0.83) and co-occurs with pronounced depression (Z = +0.99). Loneliness is extreme across domains: general loneliness (Z = +1.42), social loneliness/isolation (Z = +1.38) and family loneliness (Z = +0.80) are the highest values in the sample. Relational quality is substantially impaired: perceived friendships and peer relationships are far below average, and family relations are weakened. Social self-esteem is markedly low (Z = −0.97), reinforcing vulnerability to rejection and limiting perceived social efficacy. This cluster also exhibits high victimisation both offline and online (bullying Z = +0.60; cyberbullying Z = +0.09, with specific cybervictimisation indicators elevated in Table 1). Moreover, socio-emotional skills are consistently low (e.g., communication/social skills Z = −0.51; emotional autonomy Z = −0.43), suggesting reduced capacity to regulate emotions, seek help, and manage conflict. Problematic internet use is above average (Z = +0.39). Moreover, Cluster 2 showed pronounced decrements in satisfaction and relational ratings: family satisfaction (Z = -0.83) and friendships (Z = -1.38) were the lowest across clusters, as were ratings of relationships with classmates and family. Overall, Cluster 2 is characterised by very high suicidal ideation and depression, extreme loneliness across domains, marked relational deterioration, low social self-esteem, and reduced socio-emotional skills.

Cluster 3 – Active resilience. Cluster 3 is the largest group and represents the most protective profile. Suicidal ideation is low (Z = −0.50) and depression is well below average (Z = −0.58). All loneliness indicators are substantially below the mean (general loneliness Z = −0.50; social loneliness/isolation Z = −0.31; family loneliness Z = −0.36). Relational indicators are positive: friendships (Z = +0.26) and family relations (Z = +0.32) are above average, and perceptions of being valued by friends and family are high. Social self-esteem is also above average (Z = +0.24). This group displays the strongest socio-emotional resources, with higher emotional autonomy (Z = +0.21), self-control (Z = +0.16), and regulation indicators, alongside better communication skills. Problematic internet use is

below average (Z = −0.27), suggesting more regulated digital habits. Cluster 3 displayed the most protective subjective landscape, with high satisfaction with family (Z = 0.32) and friends (Z = 0.30), and the highest reported satisfaction with future prospects (Z = 0.23). In sum, Cluster 3 is characterised by low suicidal ideation and depression, below-average loneliness, positive relational indicators, stronger socio-emotional resources, and lower problematic internet use.

Cluster 4 – Victimised and dysregulated (visible/externalised distress). Cluster 4 combines high victimisation with deficits in self-regulation. Suicidal ideation is moderately elevated (Z = +0.24), while loneliness is close to the mean (general loneliness Z = +0.41; social isolation Z = +0.53; family loneliness Z = +0.57). Thus, distress in this cluster appears less rooted in perceived disconnection and more in conflictive and unsafe interaction contexts. Bullying is very high (Z = +1.39) and cyberbullying is extreme (Z = +2.86), indicating substantial exposure to aggression in both school and online environments. Relationships with classmates and teachers are below average (e.g., teacher relations Z = −0.26), consistent with friction in daily school life. Socio-emotional skills are compromised: emotional regulation (Z = −0.56), self-control (Z = −0.60) and autonomy (Z = −0.60) are low, pointing to dysregulation and heightened reactivity. Problematic internet use is also elevated (Z = +0.52). It also combined a bit low satisfaction with family and friends (Z = -0.18 and Z = -0.20) with poorer perceived relationships in the school arena, particularly with teachers (Z = -0.26) and, especially, friends (Z = -0.42). Taken together, Cluster 4 is characterised by high victimisation, marked cyberbullying, and lower socio-emotional regulation, autonomy, and self-control.

Across profiles, girls were over-represented in Clusters 1 and 2, whereas boys were more common in Cluster 4.

Distance-to-centroid indices suggested that Cluster 3 was the most internally cohesive (lower average distance), whereas Cluster 4 showed greater dispersion, consistent with heterogeneity within an externalised victimisation/dysregulation pattern. Nevertheless, centroid separation was sufficient to support substantive interpretation and to justify the four-cluster solution as a parsimonious typology for applied discussion.

Table 3 presents the psychosocial characteristics of the clusters. To facilitate comparison across profiles, Figure 1 presents the mean Z scores of the four clusters across the main grouped psychosocial indicators, with the population mean represented by a reference line at Z = 0.

Table 3. Psychosocial characteristics of the clusters (mean, SD, effect size and statistical significance)

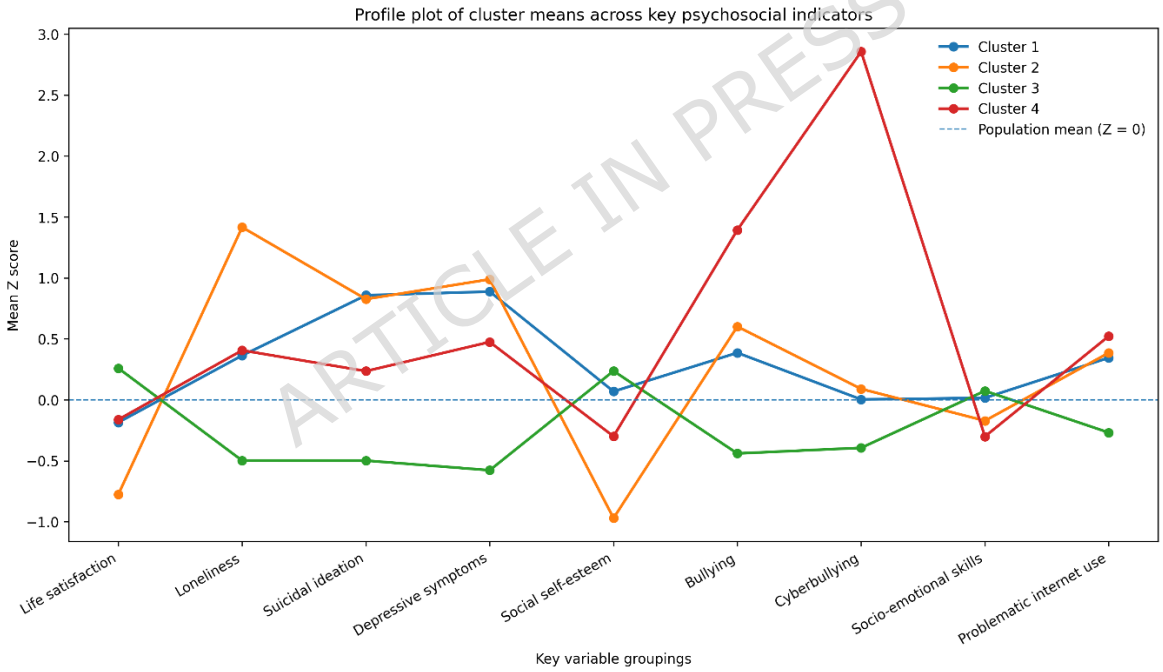
	Cluster 1		Cluster 2		Cluster 3		Cluster 4				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	η^2	F	p
Family satisfaction	-0.33	1.07	-0.83	1.26	0.32	0.69	-0.18	1.16	0.181	144,916	.000
Satisfaction with studies	-0.28	1.02	-0.59	1.13	0.26	0.84	-0.29	1.15	0.109	80.610	.000

Satisfaction with friends	0.12	0.71	-1.38	1.24	0.30	0.67	-0.20	1.22	0.316	303,320	.000
Leisure satisfaction	-0.16	1.06	-0.56	1.15	0.17	0.87	0.01	1.09	0.065	45.489	.000
Satisfaction with economic situation	-0.32	1.09	-0.60	1.22	0.27	0.77	-0.12	1.14	0.113	83.886	.000
Satisfaction with future prospects	-0.14	1.03	-0.69	1.26	0.23	0.80	-0.19	1.15	0.103	75.728	.000
Family relations	-0.26	1.07	-0.75	1.24	0.32	0.71	-0.39	1.17	0.162	126.727	.000
Teacher relations	-0.12	1.06	-0.24	1.14	0.13	0.90	-0.26	1.17	0.025	17.164	.000
Friendships	0.24	0.69	-1.24	1.24	0.26	0.73	-0.42	1.22	0.272	245,637	.000
Relationships with classmates	-0.01	0.97	-0.85	1.16	0.23	0.84	-0.20	1.08	0.131	99.273	.000
Relationships with schoolmates	-0.06	0.96	-0.78	1.13	0.20	0.88	-0.05	1.05	0.106	77.997	.000
Image of you according to friends	-0.02	0.93	-0.91	1.25	0.28	0.76	-0.47	1.15	0.174	138,220	.000
Image of you according to family	-0.19	1.05	-0.75	1.23	0.31	0.72	-0.52	1.17	0.162	126,687	.000
Problematic internet use	0.35	0.96	0.39	1.00	-0.27	0.92	0.52	0.98	0.107	78.622	.000
Concern about appearance	0.49	1.02	0.63	1.08	-0.35	0.82	0.34	0.87	0.183	147.484	.000
E-Awareness	-0.04	0.93	-0.17	0.85	0.09	1.06	-0.28	0.88	0.015	9.747	.000
E-Regulation	-0.04	0.95	-0.11	0.96	0.11	1.00	-0.56	0.97	0.033	22.658	.000
E-Self-control	-0.17	0.98	-0.12	0.98	0.16	0.97	-0.60	0.99	0.050	34.608	.000
E-Autonomy	-0.09	1.00	-0.43	1.12	0.21	0.90	-0.60	0.96	0.080	57.174	.000
E-Social Awareness	0.11	0.94	-0.05	0.95	-0.01	1.04	-0.10	0.90	0.004	2.474	.000
Loneliness	0.36	0.76	1.42	0.89	-0.50	0.62	0.41	1.16	0.456	549,943	.000
Social isolation	-0.25	0.66	1.38	1.05	-0.31	0.74	0.53	1.11	0.349	352.289	.000
Family loneliness	0.31	1.07	0.80	1.20	-0.36	0.65	0.57	1.24	0.211	175.281	.000
Suicidal ideation	0.86	1.09	0.83	1.20	-0.50	0.40	0.24	1.11	0.387	415,518	.000
Depression	0.89	0.83	0.99	1.02	-0.58	0.45	0.47	1.18	0.501	659,099	.000
Social Goals: Avoidance	0.16	0.98	0.47	0.92	-0.16	1.00	0.01	0.85	0.050	34.588	.000

Social Goals: Popularity	0.06	1.01	0.02	0.98	-0.07	1.00	0.37	0.87	0.014	9.297	.000
Emotional regulation	0.29	0.92	0.24	0.93	-0.15	1.01	0.04	0.99	0.038	26.145	.000
Social self-esteem	0.07	0.91	-0.97	0.91	0.24	0.92	-0.30	0.88	0.169	133,474	.000
Communication and social skills	-0.20	1.02	-0.51	0.99	0.17	0.96	0.09	0.90	0.062	43.565	.000
Assertiveness	0.13	0.97	-0.19	1.07	0.06	0.97	-0.46	0.99	0.026	17.626	.000
Conflict resolution	0.15	1.01	-0.20	1.09	0.03	0.97	-0.23	0.96	0.014	9.662	.000
Bullying	0.39	0.92	0.60	0.98	-0.44	0.71	1.39	0.97	0.338	336.173	.000
Cyberbullying	0.00	0.64	0.09	0.68	-0.39	0.33	2.86	0.96	0.720	1,692.12	.000

n=1975

Figure 1. Profile plot of cluster means across key psychosocial indicators.



Note. The figure displays the mean Z scores for the four-cluster solution across the main grouped psychosocial indicators. The dashed horizontal line represents the population mean (Z = 0). Life satisfaction was computed as the mean of the standardised satisfaction indicators, and socio-emotional skills as the mean of the available standardised online and offline socio-emotional competence indicators. The remaining dimensions correspond to the standardised composite indicators used in the analytical dataset.

Discussion

Distress profiles: loneliness, suicidal ideation, and depression

The cluster analysis corroborates the heterogeneity of adolescent distress and helps clarify how unwanted loneliness, suicidal ideation, and depression co-occur in distinct risk configurations. Consistent with a person-centred approach to mapping patterns of adjustment and maladjustment (Cohen et al., 2021; Dolnicar & Grün, 2022), the four clusters align with the classic distinction between visible and hidden distress (Rescorla et al., 2007; Sánchez-García et al., 2018). Cluster 3 reflects resilience; Cluster 4 captures visible or externalised distress and interpersonal reactivity; Cluster 2 concentrates the most intense relational and emotional vulnerability; and Cluster 1, most notably, combines elevated suicidal ideation with an apparently unproblematic relational profile. This finding strengthens the central argument that not all pain is visible and supports screening strategies that do not rely solely on overt behavioural indicators.

Across clusters, the solution shows clear gradients in loneliness, suicidal ideation, and depression. Cluster 2 presents the highest levels of loneliness (general, social, and familial), alongside high depression and suicidal tendencies, suggesting a core of intrinsic distress embedded in widespread relational erosion. Cluster 4, by contrast, shows moderate suicidal ideation with near-average loneliness, but marked dysregulation expressed through conflict with peers and teachers and notable involvement in cyberbullying. Cluster 3, which included the majority of participants, was characterised by below-average loneliness and depression and by a strong concentration of affective, relational, and competence resources. Finally, Cluster 1 displays the highest suicidal ideation with only moderate loneliness and without clearly deteriorated bonds, representing a prototype of “silent” or “hidden” suffering. This pattern is especially relevant because it may remain undetected in routine school observation, given that it is not accompanied by overt conflict or visible isolation. Taken together, these patterns provide empirical grounding for evidence linking loneliness to suicide risk (Lasgaard et al., 2011; Matthews et al., 2019; Shoib et al., 2023) while reiterating that adults may struggle to identify “invisible” risk profiles in adolescents (Carli et al., 2014; Page Spears et al., 2025).

The practical relevance of Cluster 1 is particularly salient. The combination of elevated suicidal ideation, only moderate loneliness, and relatively preserved peer relationships suggests a form of internalised distress that may remain undetected in routine school observation because it is not accompanied by overt conflict or visible isolation. A group with high suicidal ideation in the absence of strong conflict or overt isolation is precisely the kind of profile likely to be missed by school-based monitoring focused on disruptive behaviour. From a developmental perspective, repeated micro-experiences of disconnection or invalidation—even without extreme loneliness—may activate hopelessness-related cognitions and helplessness (Abramson et al., 1989; Liu et al., 2015), alongside heightened sensitivity to rejection (Masten et al., 2011). In this context, problematic internet use and concern about appearance may operate as amplifiers of social comparison and persistent worry, maintaining ideation in a private sphere that is difficult to detect in educational settings (Keles et al., 2020; Orben et al., 2020; Twenge et al., 2019). This pattern reinforces the need for multidimensional and emotionally sensitive screening, especially for students who appear socially “fine” yet experience severe internal distress.

Relational vulnerability and socio-emotional resources

Regarding the objective of identifying social/personal variables, internet use, relationship assessments, and interpersonal skills associated with each profile, the cluster solution provides a coherent and interpretable mapping. At the pole of greatest vulnerability (Cluster 2), the confluence of deteriorated family and peer bonds, low social self-esteem, face-to-face and digital victimisation, deficits in regulation, self-control and autonomy, and low life satisfaction mirrors the literature on interconnected risk processes. In particular, evidence links loneliness-related risks to pathways involving social anxiety and suicidal ideation (Gallagher et al., 2014), and to reciprocal dynamics in which low self-esteem increases vulnerability to victimisation, while bullying further erodes self-concept and deepens isolation (Zimmer-Gembeck et al., 2021; Álvarez-Quiroz et al., 2023; Balluerka et al., 2023). Likewise, social and emotional skills emerge as robust moderators: greater regulation and autonomy are associated with fewer symptoms, lower problematic internet use, and reduced risk of self-harm (Quintana-Orts et al., 2025; Arrivillaga et al., 2020; Liu & Wang, 2024; Gaeta-González et al., 2025). Cluster 2 fits this framework closely, indicating an accumulated-risk configuration that calls for intensive, multi-component support.

At the opposite end of the spectrum, Cluster 3 combines high personal resources (self-esteem, social skills, regulation and self-control), strong family and friendship ties, and very low loneliness, suicidal ideation, and depression. This “protective constellation” is consistent with evidence on the buffering value of reciprocity and satisfaction in friendships, school belonging, and supportive relational climates for internalising symptoms (Gómez-López & Viejo, 2022; Marques et al., 2021; Valois et al., 2023), as well as with findings that interventions targeting social/emotional skills can reduce depression and self-harm-related thoughts (Liu & Wang, 2024). The lower problematic internet use observed in this cluster is also consistent with more regulated digital habits and weaker exposure to harmful comparison dynamics. Importantly, Cluster 3 was also the largest group in the sample, indicating that the majority of adolescents were situated in a relatively protective psychosocial configuration. From a school public health and youth development perspective, this profile can be understood not only as an outcome of positive adjustment but also as a source of prevention-oriented learning. Its concentration of relational competencies suggests the value of peer mentoring, peer-support schemes, cooperative learning environments, mediation practices, and wider school-based initiatives that strengthen belonging, emotional regulation, and supportive interaction norms. In this sense, Cluster 3 may offer a positive reference point for designing universal and selective strategies aimed at reinforcing the relational and socio-emotional assets that appear weaker in the more vulnerable profiles.

Cluster 4 represents a more “visible discomfort” profile, with high involvement in cyberbullying and bullying, poorer relationships with teachers and peers, and deficits in self-regulation and self-control, alongside slightly above-average suicidal ideation. This configuration aligns with the externalising model in which dysregulation and conflict are central (Eisenberg et al., 2010) and with research linking interpersonal conflict, dysregulation, and vulnerability in digital environments (Keles et al., 2020). The combination of high problematic internet use and social reactivity is consistent with a potential loop of digital avoidance, reinforcement of aggressive behaviours, or exposure to harm, as described in recent reviews (Herruzo et al., 2023; Chamarro et al., 2024; Abkari et al., 2025).

Importantly, this pattern may occur without high loneliness, helping explain the partial dissociation between suicidal ideation and isolation in this group.

Beyond individual-level mechanisms, consistent gradients in life satisfaction, family climate, and economic perception suggest that context shapes the availability of social connection and support. Cluster 3 aggregates more protective conditions, whereas Cluster 2 more often concentrates less protected contexts. While contextual elements are not deterministic, they can facilitate or constrain access to relational protection, consistent with evidence on the influence of open family communication and school support on suicidal ideation among Spanish adolescents (Castro Castañeda & Vargas Jiménez, 2022). This underlines the need for systemic interventions that integrate family, school, community environments, and peer groups.

Digital vulnerability, appearance concerns, and psychosocial risk

The intersection between problematic internet use, appearance concerns, and risk deserves targeted attention. Above-average problematic internet use in Clusters 1 and 2, and its peak in Cluster 4 (alongside cyberbullying), is consistent with evidence that digital social comparison can amplify emotional vulnerability and suicide risk (Herruzo et al., 2023). The profiles suggest differentiated hypotheses: in Cluster 1, problematic internet use may relate to validation-seeking and ruminative ideation; in Cluster 2, it may intensify isolation and victimisation; and in Cluster 4, it may function as a space for reactivity and conflict. This nuance is critical for designing prevention strategies that are both personalised and developmentally appropriate.

Gendered patterns and implications for intervention

Gender operates as a cross-cutting interpretative lens across clusters. Girls were overrepresented in Cluster 1 (62.1%) and Cluster 2 (64.2%), whereas boys were more prevalent in Cluster 3 (52.0%) and especially in Cluster 4 (59.7%). These distributions echo differential internalisation/externalisation patterns in adolescence (Maes et al., 2019; Miranda-Mendizabal et al., 2019; Campisi et al., 2020). Moreover, differential socialisation of emotion regulation, such as stronger emphasis on self-control among boys and emotion regulation among girls, may shape (Quintana-Orts et al., 2025). In this sense, gender should not be treated as merely descriptive: it offers a criterion for tailoring interventions (e.g., targeted emotional screening for hidden distress among girls; regulation and conflict-management supports among boys where externalisation predominates).

Implications for prevention and intervention

Overall, the profiles extracted through cluster analysis translate into actionable implications: brief emotional screenings to reduce “false negatives” in hidden risk (Cluster 1); intensive, multi-component supports for accumulated vulnerability (Cluster 2); mobilisation of resilient youths’ relational capital (Cluster 3); and restorative, regulation-focused, and digitally informed interventions where visible distress predominates (Cluster 4). A gender-sensitive approach, paired with support for healthy digital practices and social/emotional skill development, emerges as a coherent cross-cutting strategy for improving detection and prevention across adolescent mental health.

Personal-level implications

The cluster solution suggests that adolescent distress should not be approached through a uniform prevention model. Instead, detection and support strategies should be sensitive to differentiated psychosocial configurations. In particular, Cluster 1 highlights the need for confidential emotional screening procedures capable of identifying students with elevated suicidal ideation even in the absence of overt conflict or visible social withdrawal. This profile underscores the importance of incorporating brief assessments of suicidal ideation, emotional loneliness, depressive symptoms, and problematic internet use into routine wellbeing monitoring. For adolescents in Cluster 2, who combine high loneliness, depressive symptoms, low social self-esteem, and victimisation, interventions should be more intensive and multi-component, integrating emotional support, social skills development, and targeted mental health referral pathways. By contrast, Cluster 4 points to the need for interventions focused on emotional regulation, self-control, conflict management, and safe digital practices. These findings support person-centred prevention frameworks able to distinguish between hidden, cumulative, resilient, and externalised forms of distress.

Familial-level implications

The results also point to the relevance of the family relational context in adolescent psychosocial wellbeing. Although family variables in this study were based on adolescents' self-reports, the profiles indicate that lower family satisfaction, poorer perceived family relationships, and family loneliness are concentrated in the most vulnerable groups. This suggests that prevention efforts should not focus exclusively on the individual adolescent but should also strengthen family communication, emotional support, and the relational climate at home. Family-oriented guidance may be especially important for adolescents in Cluster 2, where cumulative vulnerability appears to be associated with relational deterioration across multiple domains. More broadly, the findings support the inclusion of family awareness initiatives aimed at improving recognition of hidden emotional distress, particularly in adolescents who may appear outwardly adjusted despite reporting severe internal suffering.

School and policy implications

At school and policy level, the findings reinforce the need for multi-tiered and context-sensitive mental health strategies. Universal prevention programmes should include socio-emotional learning, anti-bullying and anti-cyberbullying components, and digital wellbeing education. At the same time, schools need selective and indicated strategies for students showing different forms of vulnerability, including those whose distress may remain unnoticed because it is not behaviourally disruptive. The profiles identified in this study suggest that schools should combine emotional screening tools, referral protocols, restorative approaches to peer conflict, and coordinated work with families and mental health services. From a broader policy perspective, adolescent mental health initiatives should move beyond one-size-fits-all approaches and support early detection systems that recognise both visible and invisible forms of psychosocial suffering. A gender-sensitive perspective is also essential to ensure that internalising and externalising pathways of distress are both adequately identified and addressed.

Limitations

Despite its strengths, this study has some limitations that should be considered when interpreting the results.

First, the cross-sectional design means that causal relationships cannot be established between the variables analysed, which limits the understanding of the temporal dynamics of adolescent distress; future longitudinal research would provide data on the stability and evolution of the profiles identified in this study.

Second, the use of self-report instruments may lead to social desirability bias or underreporting of emotional experiences, although validated scales and anonymity procedures were used to minimise these effects. Furthermore, the non-probability, school-based sample limits the generalisability of findings to adolescents outside formal education or to other sociocultural settings; replication in representative and cross-context samples is therefore warranted. Moreover, the application of cluster analysis involves a certain simplification of the complexity of adolescent distress by establishing discrete categories; however, this technique has proven useful for identifying relevant and easily interpretable risk patterns.

An additional limitation is that no individual clinical background information was collected regarding previous mental health diagnoses, emotional disorders, or ongoing/past psychological or psychiatric treatment. As the study was designed as an anonymous school-based survey in a community sample, the inclusion of such highly sensitive data was restricted by ethical and data-protection considerations. Consequently, the identified psychosocial profiles should not be interpreted as clinical categories, and future research would benefit from examining how these patterns relate to clinically assessed mental health histories and treatment trajectories. Likewise, neurodevelopmental conditions were not specifically assessed or used as exclusion criteria. This is relevant because some neurodevelopmental characteristics may be associated with emotional regulation, interpersonal functioning, and psychosocial vulnerability. However, the indicators used in this study—such as social self-esteem, emotional regulation, and social skills—should not be interpreted as proxies for neurodevelopmental diagnosis or screening. Therefore, the clusters identified here should be understood as psychosocial configurations within a community sample rather than as groups differentiated by clinical or neurodevelopmental status. Future research would benefit from examining whether these profiles vary when neurodevelopmental conditions are explicitly measured. In addition, although the study included family-related indicators, these were based exclusively on adolescents' self-reports. Therefore, the family context was captured through participants' perceptions rather than through direct parental measures or multi-informant assessments. Future research would benefit from incorporating parental socialisation variables, parental emotional regulation, and other family-process indicators obtained from multiple informants.

Despite these limitations, the study provides a solid empirical basis for advancing a multidimensional understanding of adolescent suffering and for guiding specific interventions in mental health and psychosocial well-being.

Conclusions

This study identified four distinct psychosocial profiles among adolescents, showing that suicidal ideation, loneliness, depression, victimisation, socio-emotional skills, and problematic internet use combine in differentiated ways rather than following a single pattern of risk. In particular, the findings highlight the coexistence of hidden distress, cumulative relational vulnerability, resilient adjustment, and visible dysregulation, underscoring the value of person-centred approaches for improving the detection and understanding of adolescent psychosocial suffering.

Future research should examine the longitudinal stability of these profiles and explore how they vary across broader socio-demographic, educational, and clinical contexts. From an applied perspective, the results support the development of multidimensional, context-sensitive, and gender-aware strategies capable of recognising both visible and invisible forms of distress in adolescence.

Availability of Data and Materials

The datasets generated and analysed during the current study are not publicly available due to ethical and privacy restrictions. The study instrument is available from the corresponding author on reasonable request.

Consent for publication

Not applicable.

Funding

This study was funded by the Government of Aragón under the Call for R&D&I projects in priority areas and of a multidisciplinary nature for the 2024–2026 period (reference: PROY_S05_24).

References

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, *96*(2), 358–372. https://doi.org/10.1037/0033-295X.96.2.358

Akbari, Z., Serjouie, F., Sarani Yaztappeh, J., Turkzadeh, M. H., Ziaei, F., Bagheri, A., Sate Zohd, M., & Kianimoghadam, A. S. (2025). Investigating the relationships between Internet addiction and suicidal ideation in adolescent girls. *Iranian Journal of Psychiatry, 20(*1), 48–58. https://doi.org/10.18502/ijps.v20i1.17401

Álvarez Quiroz, G., Guerrero Martelo, M., Algarín Alcalá, S., Zamudio González, R., & Sánchez Márquez, N. (2023). Relationship between bullying, cyberbullying and self-esteem: prevalence and associated factors in adolescents in Colombia. *Zona Próxima*(38), 88–109. https://dx.doi.org/10.14482/zp.38.329.137

Arrivillaga, C., Rey, L., & Extremera, N. (2020). Adolescents' problematic internet and smartphone use is related to suicide ideation: Does emotional intelligence make a difference? *Computers in Human Behaviour*, *110*, 106375. https://doi.org/10.1016/j.chb.2020.106375

Balluerka, N., Aliri, J., Goñi-Balentziaga, O., & Gorostiaga, A. (2023). Association between bullying victimisation, anxiety and depression in childhood and adolescence: The mediating effect of self-esteem. *Revista de Psicodidáctica*, *28*(1), 26–34. https://doi.org/10.1016/j.psicoe.2022.11.002

Bendezú, J. J., Thai, M., Wiglesworth, A., Cullen, K. R., & Klimes-Dougan, B. (2022). Adolescent stress experience–expression–physiology correspondence: Links to depression, self-injurious thoughts and behaviours, and frontolimbic neural circuitry. *Journal of Affective Disorders, 300,* 269–279. https://doi.org/10.1016/j.jad.2021.12.098

Beranuy, M., Chamarro, A., Graner, C., & Carbonell, X. (2009). Validación de dos escalas breves para evaluar la adicción a Internet y el abuso de móvil. *Psicothema, 21*(3), 480–485.

Biswas, T., Scott, J., Munir, K., Renzaho, A. M. N., Rawal, L. B., Baxter, J., & Al Mamun, A. (2020). Global variation in the prevalence of suicidal ideation, anxiety and their correlates among adolescents: A population-based study of 82 countries. Social Science Research Network. https://doi.org/10.2139/SSRN.3514766

Bodega, P., Santos-Beneit, G., de Cos-Gandoy, A., Moreno, L. A., de Miguel, M., Orrit, X., Tresserra-Rimbau, A., Martínez-Gómez, J., Ramírez-Garza, S. L., Laveriano-Santos, E. P., Arancibia-Riveros, C., Estruch, R., Lamuela-Raventós, R. M., Fernández-Jiménez, R., & Fernández-Alvira, J. M. (2023). Clustering of lifestyle behaviours and adiposity in early adolescents in Spain: Findings from the SI! Programme for Secondary Schools. *BMC Public Health, 23,* 1535. https://doi.org/10.1186/s12889-023-16461-6

Campisi, S. C., Carducci, B., Akseer, N., Zasowski, C., Szatmari, P., & Bhutta, Z. A. (2020). Suicidal behaviours among adolescents from 90 countries: A pooled analysis of the global school-based student health survey. *BMC Public Health, 20,* 1102. https://doi.org/10.1186/s12889-020-09209-z

Cardona Jiménez, J. L., Villamil Gallego, M. M., Henao Villa, E., & Quintero Echever, Á. (2010). ESTE scale validation to measure loneliness in adult population. *Investigación y Educación en Enfermería, 28*(3). https://doi.org/10.17533/udea.iee.7609.

Carli, V., Hoven, C. W., Wasserman, C., Chiesa, F., Guffanti, G., Sarchiapone, M., Apter, A., Balazs, J., Brunner, R., Corcoran, P., Cosman, D., Haring, C., Iosue, M., Kaess, M., Kahn, J. P., Keeley, H., Postuvan, V., Saiz, P., Varnik, A., & Wasserman, D. (2014). A newly identified group of adolescents at "invisible" risk for psychopathology and suicidal behaviour: Findings from the SEYLE study. *World Psychiatry, 13(*1), 78–86. https://doi.org/10.1002/wps.20088

Castro Castañeda, R., & Vargas Jiménez, E. (2022). Suicidal ideation in adolescents from a psychosocial perspective. *Contemporary Dilemmas: Education, Politics and Values*, *9*(3), e3204. https://doi.org/10.46377/dilemas.v9i3.3204

Chamarro, A., Díaz-Moreno, A., Bonilla, I., Ruíz-López, M. J., Gómez-López, M., De la Caba, S., Goñi-Balentziaga, O., & Buela-Casal, G. (2024). Stress and suicide risk among adolescents: The role of problematic internet use, gaming disorder and emotional regulation. *BMC Public Health, 24,* 326. https://doi.org/10.1186/s12889-024-17860-z

Choi, W. S., Kim, J. H., & Lee, S. Y. (2024). An exploratory study on spatiotemporal clustering of suicide in Korean adolescents. *Child and Adolescent Psychiatry and Mental Health, 18(*1), 54. https://doi.org/10.1186/s13034-024-00745-9

Cohen, J. R., Choi, J. W., Thakur, H., & Temple, J. R. (2021). Psychological distress and well-being in trauma-exposed adolescents: A residualised, person-centred approach to resilience. *Journal of Traumatic Stress*, *34*(3), 487–500. https://doi.org/10.1002/jts.22646

Dalmaijer, E. S., Nord, C. L., & Astle, D. E. (2022). Statistical power for cluster analysis. *BMC Bioinformatics*, *23*, 205. https://doi.org/10.1186/s12859-022-04675-1

De la Hoz-Granadillo, E. J., Rueda, J. M., & Quiroga, M. Á. (2023). Cluster analysis and artificial neural networks to assess and diagnose suicide ideation in school adolescents. *International Journal of Psychology*, *20*(2), 145–160. https://doi.org/10.30849/ripijp.v57i2.1360

Delaney, K., Fleming, T., Clark, T., Fenaughty, J., Lucassen, M., Crengle, S., … Denny, S. (2024). Distinct profiles of mental health need and high need overall among New Zealand adolescents: Cluster analysis of population survey data. *Australian & New Zealand Journal of Psychiatry*. Advance online publication. https://doi.org/10.1177/00048674241243262

Dever, B. V., Gallagher, E. K., Hochbein, C., Loukas, A., & Dai, C. (2017). Examining subtypes of behavioural/emotional risk using cluster analysis. *Journal of Psychoeducational Assessment*, *35*(6), 628–632. https://doi.org/10.1177/0734282916657646

Dickerson, K. L., Milojevich, H. M., & Quas, J. A. (2022). Perceived social status and suicidal ideation in maltreated children and adolescents. *Research on Child and Adolescent Psychopathology*, *50*(3), 349–362. https://doi.org/10.1007/s10802-021-00852-7

Dolnicar, S., & Grün, B. (2022). Cluster Analysis (pp. 509–511). https://doi.org/10.4337/9781800377486

Eccles, J. S., & Roeser, R. W. (2011). Schools as developmental contexts during adolescence. *Journal of Research on Adolescence*, *21*(1), 225–241. https://doi.org/10.1111/j.1532-7795.2010.00725.x

Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology*, *6*, 495–525. https://doi.org/10.1146/annurev.clinpsy.121208.131208

Fonseca-Pedrero, E., Paino, M., Lemos-Giráldez, S., & Muñiz, J. (2010). Propiedades psicométricas de la depression anxiety and stress scales-21 (DASS-21) en universitarios españoles. *Ansiedad y estrés, 16*, 215-226.

Fonseca-Pedrero, E., Inchausti, F., Pérez-Gutiérrez, L., Aritio Solana, R., Ortuño-Sierra, J., Sánchez-García, M. Á., Lucas-Molina, B., Domínguez, C., Foncea, D., Espinosa, V., Gorría, A., Urbiola-Merina, E., Fernández, M., Merina Díaz, C., Gutiérrez, C., Aures, M., Campos, M. S., Domínguez-Garrido, E., & Pérez de Albéniz Iturriaga, A. (2018). Suicidal ideation in a community-derived sample of Spanish adolescents. *Journal of Psychiatry and Mental Health, 11(*2), 76–85. https://doi.org/10.1016/j.rpsm.2017.07.004

Fukuya, Y., Suyama, S., Ogawa, S., Yamawaki, K., Morisaki, N., & Ishitsuka, K. (2025). Association of loneliness with problematic internet use among adolescents aged 10 to 16: A longitudinal study. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-025-01556-5

Gaeta-González, M. L., Orejudo, S., & Cebollero-Salinas, A. (2025). FoMO and socioemotional e-competencies as predictors of media multitasking, phubbing and cybergossip in university students: Transnational differences between Mexico and Spain by gender. *Journal of Community Psychology*, *53*(2), e23183. https://doi.org/10.1002/jcop.23183

Gagliano, A., Costanza, C., Curatolo, D., Elia, M., & Giustolisi, B. (2024). Neurodevelopmental disorders and suicide: A narrative review. *Journal of Clinical Medicine*, *13*(6), 1627. https://doi.org/10.3390/jcm13061627

Gallagher, M. W., Prinstein, M. J., Simon, V. A., & Spirito, A. (2014). Social anxiety symptoms and suicidal ideation in a clinical sample of early adolescents: Examining cognitive and interpersonal pathways. *Journal of Abnormal Child Psychology*, *42*, 871–883. https://doi.org/10.1007/s10802-013-9844-7

Gómez-Delgado, G., Ponce Rojo, A., Ramírez Mireles, J. E., Carmona-Moreno, F. de J., Flores Salcedo, C. C., & Hernández Romero, A. M. (2024). Suicide risk factors in high school students . *International Journal of Environmental Research and Public Health*, *21*(8), 1055. https://doi.org/10.3390/ijerph21081055

Gómez-López, M., & Viejo, C. (2022). Peer relationship satisfaction and adolescent mental health: A longitudinal study. *Child and Youth Services Review*, *136*, 106431. https://doi.org/10.1016/j.childyouth.2022.106431

González-Gómez, A. M., Orejudo, S., & Cebollero-Salinas, A. (2024). Socio-emotional competencies of Colombian high school students in face-to-face and virtual environments. *Revista Latinoamericana de Psicología*, *56*, 81–91. https://doi.org/10.14349/rlp.2024.v56.9

Gusqui, L., Rodríguez, A., Moncayo, K., & Llerena, Á. (2025). Emotional education and bullying prevention in the educational context. *Esprint Investigación*, *4*(1), 69–80. https://doi.org/10.61347/ei.v4i1.95

He, X., Chen, S., Yu, Q., Yang, P., & Yang, B. (2024). Correlations between problematic internet use and suicidal behavior among Chinese adolescents: A systematic review and meta-analysis. *Frontiers in Psychiatry, 15*, 1484809. https://doi.org/10.3389/fpsyt.2024.1484809

Herruzo, C., Sánchez-Guarnido, A. J., Pino, M. J., Lucena, V., Raya, A. F., & Herruzo, F. J. (2023). Suicidal behaviour and problematic internet use in college students. *Psicothema*, *35*(1), 77–86. https://doi.org/10.7334/psicothema2022.15

Iranzo, B., Buelga, S., Cava, M. J., & Ortega-Barón, J. (2019). Cyberbullying, psychosocial adjustment, and suicidal ideation in adolescence. *Psychosocial Intervention*, *28*, 75–81. https://doi.org/10.5093/pi2019a5

Jiménez, T. I., Estevez-García, F., & Estevez, E. (2024). Suicidal behaviour in adolescents: An ecological-relational study. *Psicothema*, *36*(4), 389–402. https://doi.org/10.7334/psicothema2023.258

Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, *25*(1), 79–93. https://doi.org/10.1080/02673843.2019.1590851

Kennedy, A., & Brausch, A. M. (2024). Emotion dysregulation, bullying, and suicide behaviours in adolescents. *Journal of Affective Disorders Reports*, *15*, 100715. https://doi.org/10.1016/j.jadr.2023.100715

Klomek, A. B., Marrocco, F., Kleinman, M., Schonfeld, I. S., & Gould, M. S. (2007). Bullying, depression, and suicidality in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *46*(1), 40–49. https://doi.org/10.1097/01.chi.0000242237.84925.18

Lasgaard, M., Goossens, L., & Elklit, A. (2011). Loneliness, depressive symptomatology, and suicide ideation in adolescence: Cross-sectional and longitudinal analyses. *Journal of Abnormal Child Psychology*, *39*(1), 137–150. https://doi.org/10.1007/s10802-010-9442-x

Lee, J. S., Kwon, H., Park, J., Hong, H. J., & Kweon, Y. S. (2023). A latent class analysis of suicidal behaviours in adolescents. *Psychiatry Investigation*, *20*(2), 93–100. https://doi.org/10.30773/pi.2022.0199

Ling, Y., Huebner, E. S., He, Y., & Zhong, M. (2016). Three subtypes of internalising and externalising behaviours in Chinese adolescents: Results of a latent class analysis. *Applied Research in Quality of Life*, *11*(4), 1309–1320. https://doi.org/10.1007/s11482-015-9438-3

Liu, R. T., Kleiman, E. M., Nestor, B. A., & Cheek, S. M. (2015). The hopelessness theory of depression: A quarter century in review. *Clinical Psychology: Science and Practice*, *22*(4), 345–365. https://doi.org/10.1111/cpsp.12125

Liu, X. Q., & Wang, X. (2024). Adolescent suicide risk factors and the integration of social-emotional skills in school-based prevention programmes. *World Journal of Psychiatry*, *14*(4), 494–506. https://doi.org/10.5498/wjp.v14.i4.494

Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., Linnet, C., McManus, M. N., Borwick, C., & Crawley, E. (2020). Rapid systematic review: The impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *Journal of the American Academy of Child & Adolescent Psychiatry, 59(*11), 1218–1239.e3. https://doi.org/10.1016/j.jaac.2020.05.009

López-Villalobos, J. A., López-Sánchez, M. V., & Andrés-de Llano, J. M. (2025). Prevalence and predictive model of suicidal tendencies in adolescents. *Journal of Clinical Psychology with Children and Adolescents*, *12*(1), 21–30. https://doi.org/10.21134/rpcna.2025.12.1.8

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U

Maes, M., Nelemans, S. A., Danneel, S., Van den Noortgate, W., Goossens, L., & Vanhalst, J. (2019). Loneliness and social anxiety across childhood and adolescence: Multilevel meta-analyses of cross-sectional and longitudinal associations. *Developmental Psychology, 55(*7), 1548–1565. https://doi.org/10.1037/dev0000719

Marengo, D., Fabris, M. A., Prino, L. E., Settanni, M., & Longobardi, C. (2021). Student-teacher conflict moderates the link between students' social status in the classroom and involvement in bullying behaviours and exposure to peer victimisation. *Journal of Adolescence*, *88*, 176–185. https://doi.org/10.1016/j.adolescence.2021.01.005

Marques, A., Peralta, M., Gouveia, É. R., et al. (2021). The association between school belonging and mental health in adolescents. *Journal of Adolescence*, *88*, 25–33. https://doi.org/10.1016/j.adolescence.2021.01.005

Masten, C. L., Eisenberger, N. I., Pfeifer, J. H., & Dapretto, M. (2011). Witnessing peer rejection during adolescence: Neural correlates of social pain and emotional processing. *Developmental Science*, *14*(5), 791–801. https://doi.org/10.1111/j.1467-7687.2010.01089.x

Matthews, T., Danese, A., Caspi, A., Fisher, H. L., Goldman-Mellor, S., Kepa, A., Moffitt, T. E., Odgers, C. L., & Arseneault, L. (2019). Lonely young adults in modern Britain: Findings from an epidemiological cohort study. *Psychological Medicine, 49(*2), 268–277. https://doi.org/10.1017/S0033291718000788

Menéndez Santurio, J. I., Fernández-Río, J., Cecchini Estrada, J. A., & González-Víllora, S. (2021). Bullying, basic psychological needs, responsibility, and life satisfaction: Connections and profiles in adolescents. *Annals of Psychology*, *37*(1), 133–141. https://doi.org/10.6018/analesps.414191

Miranda-Mendizabal, A., Castellví, P., Parés-Badell, O., Alayo, I., Almenara, J., Alonso, I., Blasco, M. J., Cebrià, A., Gabilondo, A., Gili, M., Lagares, C.,

Piqueras, J. A., Rodríguez-Jiménez, T., Rodríguez-Marín, J., Roca, M., Soto-Sanz, V., Vilagut, G., & Alonso, J. (2019). Gender differences in suicidal behaviour in adolescents and young adults: Systematic review and meta-analysis of longitudinal studies. *International Journal of Public Health, 64(*2), 265–283. https://doi.org/10.1007/s00038-018-1196-1

Nuñez Fadda, S. M., & Ciambelli Romero, H. C. (2023). An ecological inquiry on young people's suicidal ideation at university: Individual, relational and cultural factors and their interactions. *European Journal of Investigation in Health, Psychology and Education, 14(*1), 5. https://doi.org/10.3390/ejihpe14010005

Orben, A., Dienlin, T., & Przybylski, A. K. (2020). Social media's enduring effect on adolescent life satisfaction. *Proceedings of the National Academy of Sciences*, *117*(21), 10226–10228. https://doi.org/10.1073/pnas.1908377116

Page Spears, A., Eun, S., & Cha, C. (2025). Characterising silence: Adolescents' nondisclosure of their suicidal thoughts and behaviours to their family and peers. *JAACAP Open*, *3*(3), 496–505. https://doi.org/10.1016/j.jaacop.2024.12.005

Papapanou, T. K., Kalantzi-Azizi, A., Karademas, E. C., et al. (2023). Strong correlations between social appearance anxiety, use of social media, and feelings of loneliness in adolescents and young adults. *International Journal of Environmental Research and Public Health*, *20*(5), 4296. https://doi.org/10.3390/ijerph20054296

Piazuelo-Rodríguez, I., Bautista-Alcaine, P., Cebollero-Salinas, A., & Íñiguez-Berrozpe, T. (2024). Family and peer support as a preventive factor of cyberviolence among teenagers: Implications according to age and gender. *Aloma*, *42*(1), 37–48. https://doi.org/10.51698/aloma.2024.42.1.37-48

Prades-Caballero, V., Navarro-Pérez, J.-J., & Carbonell, Á. (2025). Factors associated with suicidal behavior in adolescents: An umbrella review using the socio-ecological model. *Community Mental Health Journal, 61*, 612–628. https://doi.org/10.1007/s10597-024-01368-2

Qualter, P., Vanhalst, J., Harris, R., Van Roekel, E., Lodder, G., Bangee, M., & Verhagen, M. (2015). Loneliness across the life span. *Perspectives on Psychological Science*, *10*(2), 250–264. https://doi.org/10.1177/1745691615568999

Quintana-Orts, C., Mérida-López, S., Gómez-Hombrados, J., & Rey, L. (2025). Emotional intelligence, family, and school factors associated with cyberbullying roles in adolescence. *Journal of Aggression, Abuse, and Trauma*, 1–21. https://doi.org/10.1080/10926771.2025.2523862

Ramos-Vera, C., Guzmán Choquehuanca, J., & Serpa Barrientos, A. (2022). Estructura factorial y de red de una escala breve de soledad (RULS-6) en adolescentes peruanos. *Revista de Psicología Clínica con Niños y Adolescentes, 9*(2), 1-10. https://doi.org/10.21134/rpcna.2022.09.2.5

Rescorla, L. A., Achenbach, T. M., Ivanova, M. Y., Dumenci, L., & Almqvist, F. (2007). Epidemiological comparisons of problems and positive qualities reported by adolescents in 24 countries. *Journal of Consulting and Clinical Psychology*, *75*(2), 351–358. https://doi.org/10.1037/0022-006x.75.2.351

Sánchez-Alonso, A., Ortega-Ruiz, R., & Nunez, J. C. (2024). Family functioning, peer relationships and school bonding: A multilevel perspective on adolescent well-being. *Current Psychology*, Advance online publication. https://doi.org/10.1007/s12144-023-04352-2

Sánchez-García, M. Á., Lucas-Molina, B., Fonseca-Pedrero, E., Pérez-Albéniz, A., & Paino, M. (2018). Emotional and behavioural difficulties in adolescence: Relationship with emotional well-being, affect, and academic performance. *Annals of Psychology*, *34*(3), 482–489. https://dx.doi.org/10.6018/analesps.34.3.296631

Shoib, S., Amanda, T. W., Saeed, F., Ransing, R., Bhandari, S. S., Armiya'u, A. Y., Gürcan, A., & Chandradasa, M. (2023). Association between loneliness and suicidal behaviour: A scoping review. *Turkish Journal of Psychiatry, 34(*2), 125–132. https://doi.org/10.5080/u27080

Steinberg, L. (2014). *Age of opportunity: Lessons from the new science of adolescence.* Houghton Mifflin Harcourt.

Valois, R. F., Zullig, K. J., & Drane, J. W. (2023). Family connectedness and adolescent psychological health: A global perspective. *International Journal of Environmental Research and Public Health*, *20*(7), 5501. https://www.mdpi.com/1660-4601/20/7/5501

Wang, P., Martín-Moratinos, M., Bella-Fernández, M., & Blasco-Fontecilla, H. (2022). Traditional bullying and cyberbullying in the digital age and their associated mental health problems in children and adolescents: A meta-analysis. *European Child & Adolescent Psychiatry*, *1*, 1–15. https://doi.org/10.1007/s00787-022-02128-x

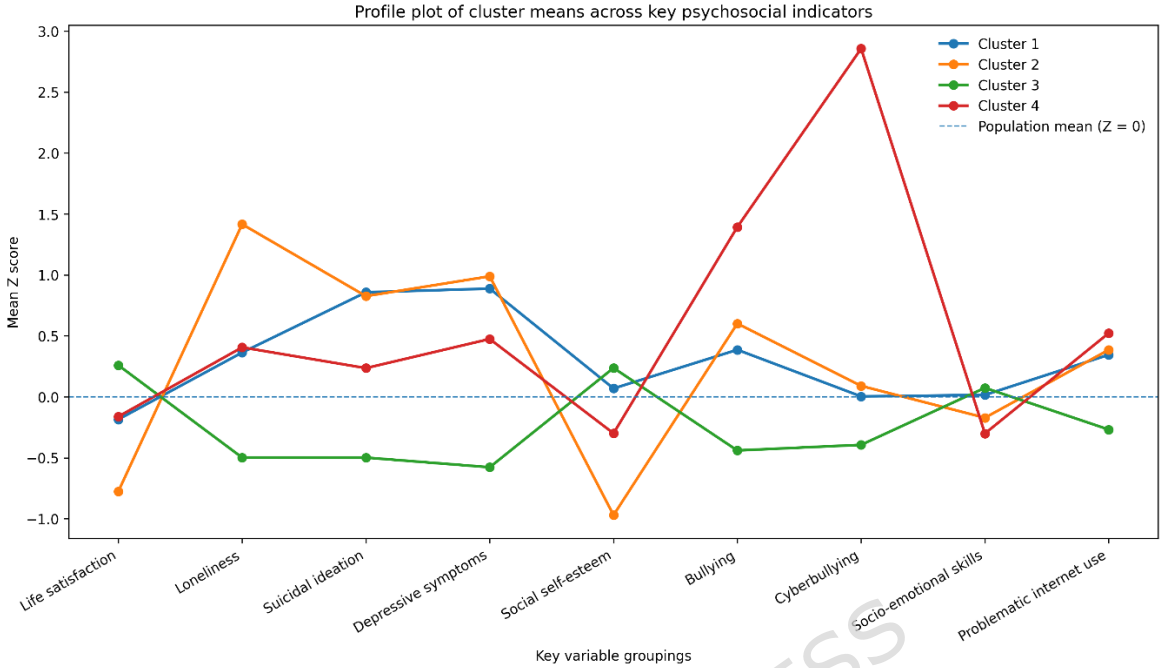
Xiao, Y., Romanelli, M., & Lindsey, M. A. (2019). A latent class analysis of health lifestyles and suicidal behaviours among US adolescents. *Journal of Affective Disorders*, *255*, 116–126. https://doi.org/10.1016/j.jad.2019.05.031

Yang, X., Wang, J., Lin, H., Yang, Y., Chen, X., & Fu, C. (2023). Psychosocial problems and suicidal ideation in Chinese adolescents: Findings from a longitudinal study. *Translational Pediatrics*, *12*(6), 1076–1087. https://doi.org/10.21037/tp-22-676

Zhan, Y., Wang, P., Zhan, Y., Lu, Z., Guo, Y., Ahmad, N. A., Owusu, A., Chher, T., Hinneh, J. T., Aryal, K. K., Darwish, N., Senanayake, S. J., Mufadhal, B. A. A., Rady, A., Bassier-Paltoo, M., & Batbaatar, S. (2024). Clustering of lifestyle risk factors in relation to suicidal thoughts and behaviours in young adolescents: A cross-national study of 45 low- and middle-income countries. *BMC Global Public Health,* 2*.* https://doi.org/10.1186/s44263-024-00055-4

Zimmer-Gembeck, M. J., Gardner, A. A., Hawes, T., Masters, M. R., Waters, A. M., & Farrell, L. J. (2021). Rejection sensitivity and the development of social anxiety symptoms during adolescence: A five-year longitudinal study. *International Journal of Behavioural Development*, *45*(3), 204–215. https://doi.org/10.1177/0165025421995921

Figure 1. Profile plot of cluster means across key psychosocial indicators.



Note. The figure displays the mean Z scores for the four-cluster solution across the main grouped psychosocial indicators. The dashed horizontal line represents the population mean (Z = 0). Life satisfaction was computed as the mean of the standardised satisfaction indicators, and socio-emotional skills as the mean of the available standardised online and offline socio-emotional competence indicators. The remaining dimensions correspond to the standardised composite indicators used in the analytical dataset.

Table 1: ANOVA of the variables included in the cluster analysis

	Cluster		Error		F	Sig.
	Quadratic mean	gl	Quadratic mean	gl		
v_7_1_family_satisfaction	118,742	3	0.819	1971	144,916	0.000
v_7_3_satisfaction_with_friends	208,528	3	0.687	1971	303,320	0.000
v_7_5_economic_satisfaction	74,527	3	0.888	1971	83,886	0.000
v_9_3_friendship_relationships	179,405	3	0.730	1971	245,637	0.000
v_12.1_B1_Someone_has_insulted_me	77,120	3	0.884	1971	87,232	0.000
v_12.2_B2_Someone_has_told_other_women	139,811	3	0.794	1971	176,164	0.000
v_12.3_B3_Someone_has_threatened_me	146,117	3	0.782	1971	186,796	0.000
v_12.5_B5_I_have_been_excluded_or_ignored	198,103	3	0.701	1971	282,709	0
v_12.6_B6_Someone_has_spread_rumours_about_me	133,736	3	0.802	1971	166,855	0
v_13.1_CB1_Someone_has_used_offensive_language_towards_me_on_social_media	173,555	3	0.737	1971	235,527	0
v_13.2__CB2_Someone_has_said_bad_things_about_me_to_others_on_social_media	217,494	3	0.666	1971	326,722	0
v_13.3_CB3_Someone_has_threatened_me_on_social_media	282,600	3	0.572	1971	493,772	0
v_13.4_CB4_Someone_has_hacked_my_account_and_stolen_my_personal_information.	328,654	3	0.484	1971	678,518	0
v_13.5_CB5_Someone_has_hacked_my_account_and_impersonated_me	310,962	3	0.519	1971	598,864	0
v_13.6_CB6_Someone_has_created_a_fake_account_pretending_to_be_me	308,033	3	0.521	1971	590,924	0
v_13.7__CB7_Someone_has_posted_information_about_me_on_social_media	314,057	3	0.515	1971	609,826	0
v_13.8__CB8_Someone_has_posted_videos_or_photos_without_my_permission_on_social_media	332,469	3	0.484	1971	686,947	0
v_13.9_CB9__Someone_has_edited_photos_of_me_without_my_permission_on_social_media	315,682	3	0.509	1971	619,885	0

v_13.10_CB10__I_have_been_excluded_or_ignored_on_social_media	224,208	3	0.654	1971	342,961	0
v_13.11__CB11_Someone_has_spread_rumours_about_me_on_social_media	206,288	3	0.677	1971	304,752	0
v_13.12__CB12_Someone_has_ridiculed_me_on_social_media	229,659	3	0.651	1971	352,657	0
v_15_1_LONELINESS1_I_need_company	102,774	3	0.848	1971	121,236	0
v_15_2_LONELINESS2_I_feel_lonely	208,472	3	0.687	1971	303,356	0
v_15_3_LONELINESS3_I_don’t_feel_close_to_anybody	187,469	3	0.712	1971	263,265	0
v_15_4_LONELINESS4_I_feel_excluded_by_others	225,769	3	0.663	1971	340,331	0
v_15_5_LONELINESS5_I_think_that_nobody_really_knows_me_well	165,945	3	0.752	1971	220,642	0
v_15_6_LONELINESS6_People_are_around_me_but_I_don't_feel_close_to_them	203,343	3	0.695	1971	292,659	0
v_18_1__SI1_I_have_felt_that_life_is_not_worth_living	189,108	3	0.717	1971	263,841	0
v_18_2__SI2_Have_you_ever_wished_you_were_dead,_like_to_go_to_sleep_and_not_wake_up?	194,053	3	0.705	1971	275,155	0
v_18_3__SI3_Have_you_thought_about_taking_your_own_life_even_if_you_haven't_done_it	176,800	3	0.733	1971	241,160	0
v_19_1_DEPRESSION1_I_could_not_feel_any_positive_emotions	162,185	3	0.755	1971	214,886	0
v_19_2_DEPRESSION2_I_find_it_difficult_to_take_the_initiative_to_do_things	158,521	3	0.765	1971	207,309	0.000
v_19_3_DEPRESSION3_I_felt_I_had_nothing_to_live_for	235,500	3	0.642	1971	366,716	0
v_19_4_DEPRESSION4_I_felt_sad_and_depressed	241,775	3	0.637	1971	379,291	0
v_19_5_DEPRESSION5_I_couldn't_get_excited_about_anything	187,102	3	0.720	1971	259,953	0
v_19_6_DEPRESSION6_I_felt_that_I_was_worthless_as_a_person	273,765	3	0.589	1971	464,997	0
v_19_7_DEPRESSION7_felt_that_life_had_no_meaning	265,510	3	0.600	1971	442,856	0
v_26_1_EMOTIONAL_REGULATION1_When_I_want_to_increase_my_positive_emotions_(e.g._joy,_fun),_I_change_the_topic_I_am_thinking_about.	75,896	3	0.886	1971	85,662	0

1_26_2_EMOTIONAL_REGULATION2_I_keep_my_emotions_to_myself_a						
v_26_4__EMOTIONAL_REGULATION4__When_I_am_feeling_positive_emotions,_I_am_careful_not_to_express_them	42,888	3	0.936	1971	45,809	0
v_26_6_EMOTIONAL_REGULATION6_I_control_my_emotions_by_not_expressing_them	42,686	3	0.937	1971	45,578	0
v_27_1_SOCIAL_SELF-ESTEEM1_make_friends_easily	86,620	3	0.870	1971	99,600	0
v_27_2__SOCIAL_SELF-ESTEEM2_I_am_a_friendly_person	40,307	3	0.940	1971	42,872	0
v_27_3__SOCIAL_SELF-ESTEEM3_It_is_not_difficult_for_me_to_make_friends	73,042	3	0.890	1971	82,037	0
v_27_4__SOCIAL_SELF-ESTEEM4_I_am_a_cheerful_person	65,475	3	0.902	1971	72,600	0
v_27_6__SOCIAL_SELF-ESTEEM_I_have_many_friends	94,677	3	0.857	1971	110,421	0
Problematic_internet_use	70,261	3	0.894	1971	78,622	0
V_16_1_INV_SocialLoneliness1_I_do_not_have_friends_with_whom_I_share_my_opinions	142,598	3	0.785	1971	181,576	0
V_16_4_INV_SocialLoneliness4_I_don't_like_the_people_I_go_out_with	158,243	3	0.760	1971	208,240	0
V16_5_INV_Social_Loneliness5_I_would_not_be_able_to_count_on_my_friends_if_I_needed_help	185,268	3	0.719	1971	257,653	0
V17_2_INV_FamilyLoneliness2_My_family_does_not_support_me_in_my_decisions	83,418	3	0.871	1971	95,772	0
V17_4_INV_SoledadFam4_I_don't_feel_accompanied_when_I'm_with_my_family	128,797	3	0.800	1971	161,067	0

Table 2: Number of cases per cluster

Cluster	Number of cases
Cluster 1	385
Cluster 2	268
Cluster 3	1173
Cluster 4	149

n=1975

Table 3: Distance of the case from its classification cluster centre

Cluster	Mean	N	SD
Cluster 1	6.98	385	1.36
Cluster 2	7.57	268	1.52
Cluster 3	5.20	1173	1.28
Cluster 4	7.99	149	2.45

n.= 1975

Table 4. Psychosocial characteristics of the clusters (mean, SD, effect size and statistical significance)

	Cluster 1		Cluster 2		Cluster 3		Cluster 4				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	η^2	F	p
Family satisfaction	-0.33	1.07	-0.83	1.26	0.32	0.69	-0.18	1.16	0.181	144,916	.000
Satisfaction with studies	-0.28	1.02	-0.59	1.13	0.26	0.84	-0.29	1.15	0.109	80.610	.000
Satisfaction with friends	0.12	0.71	-1.38	1.24	0.30	0.67	-0.20	1.22	0.316	303,320	.000
Leisure satisfaction	-0.16	1.06	-0.56	1.15	0.17	0.87	0.01	1.09	0.065	45.489	.000
Satisfaction with economic situation	-0.32	1.09	-0.60	1.22	0.27	0.77	-0.12	1.14	0.113	83.886	.000
Satisfaction with future prospects	-0.14	1.03	-0.69	1.26	0.23	0.80	-0.19	1.15	0.103	75.728	.000
Family relations	-0.26	1.07	-0.75	1.24	0.32	0.71	-0.39	1.17	0.162	126.727	.000
Teacher relations	-0.12	1.06	-0.24	1.14	0.13	0.90	-0.26	1.17	0.025	17.164	.000
Friendships	0.24	0.69	-1.24	1.24	0.26	0.73	-0.42	1.22	0.272	245,637	.000
Relationships with classmates	-0.01	0.97	-0.85	1.16	0.23	0.84	-0.20	1.08	0.131	99.273	.000
Relationships with schoolmates	-0.06	0.96	-0.78	1.13	0.20	0.88	-0.05	1.05	0.106	77.997	.000
Image of you according to friends	-0.02	0.93	-0.91	1.25	0.28	0.76	-0.47	1.15	0.174	138,220	.000
Image of you according to family	-0.19	1.05	-0.75	1.23	0.31	0.72	-0.52	1.17	0.162	126,687	.000
Problematic internet use	0.35	0.96	0.39	1.00	-0.27	0.92	0.52	0.98	0.107	78.622	.000
Concern about appearance	0.49	1.02	0.63	1.08	-0.35	0.82	0.34	0.87	0.183	147.484	.000
E-Awareness	-0.04	0.93	-0.17	0.85	0.09	1.06	-0.28	0.88	0.015	9.747	.000
E-Regulation	-0.04	0.95	-0.11	0.96	0.11	1.00	-0.56	0.97	0.033	22.658	.000
E-Self-control	-0.17	0.98	-0.12	0.98	0.16	0.97	-0.60	0.99	0.050	34.608	.000
E-Autonomy	-0.09	1.00	-0.43	1.12	0.21	0.90	-0.60	0.96	0.080	57.174	.000
E-Social Awareness	0.11	0.94	-0.05	0.95	-0.01	1.04	-0.10	0.90	0.004	2.474	.000
Loneliness	0.36	0.76	1.42	0.89	-0.50	0.62	0.41	1.16	0.456	549,943	.000

Social isolation	-0.25	0.66	1.38	1.05	-0.31	0.74	0.53	1.11	0.349	352.289	.000
Family loneliness	0.31	1.07	0.80	1.20	-0.36	0.65	0.57	1.24	0.211	175.281	.000
Suicidal ideation	0.86	1.09	0.83	1.20	-0.50	0.40	0.24	1.11	0.387	415,518	.000
Depression	0.89	0.83	0.99	1.02	-0.58	0.45	0.47	1.18	0.501	659,099	.000
Social Goals: Avoidance	0.16	0.98	0.47	0.92	-0.16	1.00	0.01	0.85	0.050	34.588	.000
Social Goals: Popularity	0.06	1.01	0.02	0.98	-0.07	1.00	0.37	0.87	0.014	9.297	.000
Emotional regulation	0.29	0.92	0.24	0.93	-0.15	1.01	0.04	0.99	0.038	26.145	.000
Social self-esteem	0.07	0.91	-0.97	0.91	0.24	0.92	-0.30	0.88	0.169	133,474	.000
Communication and social skills	-0.20	1.02	-0.51	0.99	0.17	0.96	0.09	0.90	0.062	43.565	.000
Assertiveness	0.13	0.97	-0.19	1.07	0.06	0.97	-0.46	0.99	0.026	17.626	.000
Conflict resolution	0.15	1.01	-0.20	1.09	0.03	0.97	-0.23	0.96	0.014	9.662	.000
Bullying	0.39	0.92	0.60	0.98	-0.44	0.71	1.39	0.97	0.338	336.173	.000
Cyberbullying	0.00	0.64	0.09	0.68	-0.39	0.33	2.86	0.96	0.720	1,692.12	.000

n=1975