

Loneliness in emerging adulthood: A cluster analysis of psychological risk and protective factors[☆]

Alejandro Sanchis-Sanchis^{a,*,}, Yolanda Ruiz-Ordóñez^{b,*,}, Inmaculada Aragonés Barberá^{c,},
María Dolores Grau Sevilla^{a,}

^a Departamento Psicología de la Personalidad, Tratamiento y Metodología, Facultad de Psicología, Universidad Católica de Valencia San Vicente Mártir, Spain

^b Departamento de Psicología Básica, Neuropsicología y Social, Facultad de Psicología, Universidad Católica de Valencia San Vicente Mártir, Spain

^c Departamento Ciencias de la Ocupación, Facultad de Psicología, Universidad Católica de Valencia San Vicente Mártir, Spain

ARTICLE INFO

Keywords:

Loneliness
Emerging adulthood
Emotion regulation
Meaning in life
Psychopathology

ABSTRACT

Loneliness is a complex phenomenon associated with significant effects on the quality of life and mental health of emerging adults. The objectives were to assess the behavioral profiles of emerging adults based on anxiety, depression, purpose in life, emotional regulation, and perceived social support, and to compare differences in loneliness according to the resulting behavioral profiles. A sample of 376 individuals aged 19 to 29 was evaluated. The study identified three loneliness profiles among emerging adults. The first group, characterized by high social support and purpose in life, exhibited lower levels of anxiety, depression, and loneliness. In contrast, the second and third groups, with low social support and greater use of emotional suppression, showed higher levels of anxiety, depression, and loneliness. The inverse relationship between purpose in life and loneliness highlighted the potential protective function of a strong sense of purpose. Findings emphasized the need for tailored interventions to improve mental health and strengthen social support networks.

Loneliness is a complex and multifactorial phenomenon that constitutes the central focus of the present study, given its negative impact across the life span (Hawkey & Cacioppo, 2010). Interest in this construct has grown significantly in the wake of the COVID-19 pandemic given its association with lower quality of life and poorer psychological well being (Brailovskaia et al., 2021). Loneliness is conceptualized as a negative emotional state that arises from a perceived discrepancy between desired and actual social relationships. Individuals who experience dissatisfaction with their social connections report higher levels of loneliness (Adamczyk et al., 2022). This phenomenon has a subjective component, meaning that a person may feel lonely despite being surrounded by others, or conversely, may not experience loneliness even with a limited social network.

From a theoretical perspective, different models have sought to explain loneliness as a central construct. Thus, the Evolutionary Theory of Loneliness (Cacioppo et al., 2006) understands it as an adaptive

biological signal that motivates the pursuit of social connection in order to increase survival and reproductive chances. In turn, the Socio Cognitive Model (Cacioppo & Hawkey, 2009) addresses the mechanisms through which loneliness is associated with health and well being. Hawkey and Cacioppo (2010) proposed The Loneliness Model to explain how cognitive, emotional, and social processes are associated with loneliness by forming a feedback loop that sustains and amplifies perceived isolation (i.e., loneliness, see Fig. 1). Perceived social isolation is conceptualized as a signal of social threat, triggering hypervigilance for negative social cues. This heightened sensitivity biases cognition, leading individuals to interpret social interactions more negatively, expect rejection, and recall adverse social experiences. These cognitive biases foster behavioral responses—such as withdrawal or defensiveness—that elicit confirming reactions from others, thereby reinforcing loneliness in a self-perpetuating cycle. This loop is accompanied by negative affective states (e.g., anxiety, hostility, low self-

[☆] This study was funded through the UCV Ingenio program by the Universidad Católica de Valencia San Vicente Mártir, grant number: 2024-255-903.

The protocol of the study was approved by the Research Ethics Committee of the Catholic University of Valencia "San Vicente Mártir" under project code UCV/2022-2023/059.

This research was not pre-registered. The data can be obtained at: doi:<https://doi.org/10.5281/zenodo.15753488>.

* Corresponding author.

E-mail addresses: alejandro.sanchis@ucv.es (A. Sanchis-Sanchis), yolanda.ruiz@ucv.es (Y. Ruiz-Ordóñez), inmaculada.aragones@ucv.es (I. Aragonés Barberá), lola.grau@ucv.es (M.D. Grau Sevilla).

<https://doi.org/10.1016/j.actpsy.2026.107482>

Received 2 December 2025; Received in revised form 22 June 2026; Accepted 16 July 2026

Available online 18 July 2026

0001-6918/© 2026 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

esteem) and contributes to downstream neurobiological and health-related consequences.

In this framework, emerging adulthood constitutes a particularly relevant period for the study of loneliness. For Jeffrey Arnett (2000), this stage is characterized by a constant sense of transition, identity exploration, work related instability, labor and interpersonal uncertainty, delayed assumption of adult and social roles, and relative social independence. Emotional independence represents a key developmental task in this stage (Jankowiak et al., 2025), although some authors define it as spanning from age 18 to 25, while others extend it up to age 29 (Brown, 2023).

In Spain, official reports indicate a prevalence of loneliness of 20%, with 67.7% of affected individuals experiencing it for more than two years (SoledadES et al., 2024). Empirical evidence supports the relevance of loneliness in emerging adults, whose prevalence rates range from 34% (Akram et al., 2023) to 46.7% (Barroso et al., 2019), with 41.3% experiencing moderate to severe loneliness and 14.2% severe or very severe loneliness (Wolters et al., 2023). However, the classification of loneliness severity varies across studies depending on the cut-off points or criteria used. For instance, in a study with university students in the UK using the UCLA-3 version, loneliness was classified into three levels: high loneliness (≥ 52 –80), moderate loneliness (≥ 40 –51), and no loneliness (≤ 39) (Akram et al., 2023). Similarly, other adaptations of the scale, such as the UCLA-BR used in Brazilian university samples, have proposed a four-level classification: minimal loneliness (0–22), mild loneliness (23–35), moderate loneliness (36–47), and intense loneliness (48–60) (Barroso et al., 2019). Among the main factors associated with the increase in loneliness among emerging adults (Buecker et al., 2021) are changes of residence, the start of academic studies or professional trajectories, and the pressure to meet social and

personal expectations. (Kirwan et al., 2023); exposure to critical life transitions (in family, autonomy, and the labor market) is associated with an increase in loneliness (Yang et al., 2023). These data underscore the need to analyze loneliness as a central variable in this life stage.

Loneliness has been strongly associated with mental health problems and, in some cases, may be masked by these conditions (Nielsen et al., 2024). Specifically, loneliness is associated with higher levels of depression, anxiety, dementia, and substance use disorders (Holt-Lunstad, 2017; Ingram et al., 2020; Mobach et al., 2024; Nielsen et al., 2024; Wang et al., 2017; Wolters et al., 2023). Among emerging adults with high loneliness, over 40% exhibited moderate to severe anxiety (Akram et al., 2023) and more than 28% showed mild to severe depressive symptoms (Yang et al., 2023).

A sense of purpose in life has been identified as a particularly relevant factor in relation to loneliness. It is defined as a primary human motivation and basis of self actualization (Frankl, 1965, 2006) and as a cognitive system that provides meaning to life through the integration of coherence, purpose, and accomplishment (Borawski, 2022a; Borawski, 2022b; Martela & Steger, 2016; Neville et al., 2018; Przepiorka, 2012; Wong, 1989). This construct configures a structure of values and interpretations that provide meaning and orientation to existence (Marco et al., 2020).

Individuals with a stronger sense of purpose typically report lower levels of loneliness, anxiety, and depression, alongside elevated psychological well-being. This positions it as a protective factor against loneliness across clinical and non-clinical samples, irrespective of gender or age differences (Barcaccia et al., 2023; Boreham & Schutte, 2023; Macià et al., 2021; Sutin et al., 2022).

Loneliness is a central phenomenon that is interconnected with meaning in life at both psychological and neural levels (Mwilambwe-

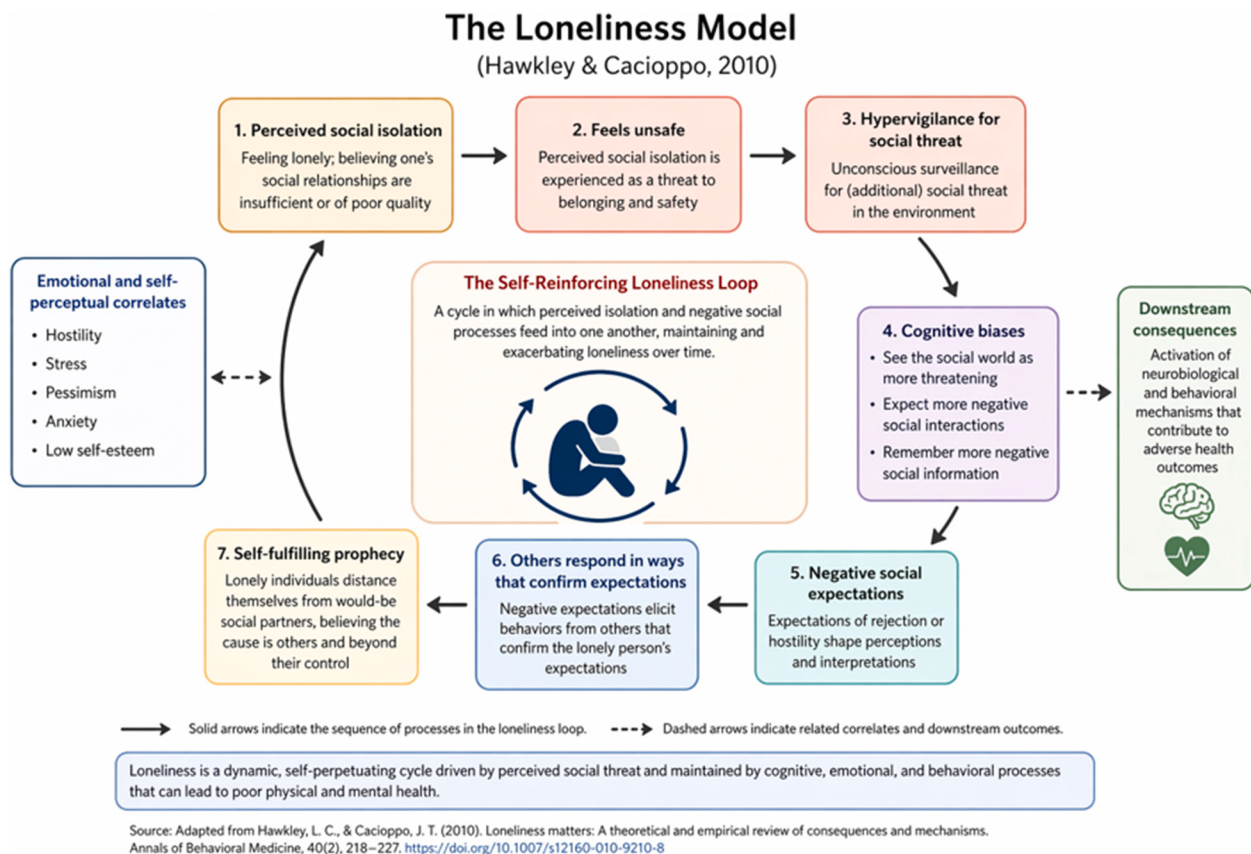


Fig. 1. The Loneliness Model (adapted from Hawkey & Cacioppo, 2010).

Note. Perceived social isolation triggers hypervigilance to social threat, leading to negative cognitive biases and expectations of rejection. These biases shape behaviors that elicit confirming responses from others, creating a self-reinforcing cycle of loneliness accompanied by negative affect and adverse health outcomes.

Tshilobo et al., 2019), so that the presence or absence of meaning is associated with higher or lower levels of loneliness (Macià et al., 2021). During emerging adulthood, various factors are related to this sense, including the perception of being needed (Silva, 2020) and belonging may be associated with higher levels of meaning in life and lower levels of loneliness (Adamczyk et al., 2022).

Another variable associated with loneliness is perceived social support, defined as the perception that people are available to provide emotional, material, or informational support when needed. This perception does not necessarily reflect the actual amount of received support, but rather how the individual evaluates their social support situation (Eagle et al., 2019; Gabardo-Martins et al., 2017; Haber et al., 2007). Individuals with high social support feel valued and accompanied and, in general, report lower levels of loneliness among adults (Aydiner-Boylu et al., 2019; Gan et al., 2020). Moreover, several studies indicate that people with depression perceive lower levels of social support (Wang et al., 2018). Loneliness, in part, is associated with both the lack or loss of group based social connections and limitations in access to key psychological resources (Haslam et al., 2019). Women perceive higher social support than men, which may be associated with lower levels of loneliness, possibly because men tend to have smaller and less emotionally intimate support networks (Adamczyk, 2015).

Loneliness is associated with emotion regulation, and difficulties therein are linked to poorer relational functioning and lower levels of personal well-being (Gross, 2002; Lopes et al., 2005). Thus, difficulties in emotion regulation are associated with higher levels of loneliness (Groarke et al., 2020; Orozco-Vargas, 2022). Adaptive and maladaptive emotion regulation strategies are distinguished according to their association with psychopathological symptoms (Aldao, 2012). Emotional suppression, considered maladaptive, is associated with greater symptomatology of emotional disorders, whereas strategies such as reappraisal, acceptance, and problem solving are considered adaptive, as they are associated with lower symptomatology. Emotional suppression levels tend to be lower during interactions perceived as pleasant, in contexts where there is less need to regulate emotional responses (Main et al., 2025). And maladaptive emotion regulation strategies are associated with higher levels of loneliness, particularly among individuals with mental health problems (Eres et al., 2020; Kearns & Creaven, 2017).

In addition, individuals who frequently resort to emotional suppression experience fewer positive emotions, more negative emotions, and more limited interpersonal functioning (Gross & John, 2003). Likewise, emotional suppression has been associated with greater vulnerability to loneliness, being linked to higher levels of loneliness in those who use it more frequently (Eldesouky et al., 2024; Kearns & Creaven, 2017).

In fact, the high loneliness profile is characterized by greater rumination, catastrophizing, and other maladaptive strategies, as well as greater suppression of emotional expression and a more active withdrawal from or rejection of others compared to low loneliness profiles (Preece et al., 2021). The literature has described strong associations between loneliness and emotional expression, evidenced by greater sensitivity to emotional cues and reduced emotional mimicry in individuals experiencing higher levels of loneliness (Arnold & Winkelman, 2020).

Within this framework, and consistent with Hawkey and Cacioppo's (2010) model of loneliness, which emphasizes the dynamic interplay of cognitive, emotional, and social processes in the experience and maintenance of loneliness, it becomes essential to identify distinct profiles of individuals. Such profiling should consider key variables including emotion regulation, perceived social support, mental health symptomatology, and sense of purpose in life. This approach would enable the development of more precisely targeted interventions and support strategies tailored to individuals' specific characteristics across these domains. Ultimately, loneliness should remain the primary outcome of interest, with the overarching goal of improving well-being and quality

of life within this population.

Although our study assesses various variables, loneliness is the primary construct (outcome), rather than a secondary symptom. Unlike general psychopathology (e.g., depression, anxiety), loneliness represents a specific relational deficit that, alongside risk and protective factors, defines the behavioral profiles of emerging adults.

Therefore, the objectives of the present study are a) To evaluate the behavioral profiles of emerging adults based on anxiety, depression, purpose in life, emotional suppression, and perceived social support. b) To examine loneliness as the primary outcome, comparing loneliness scores across the resulting behavioral profiles.

Based on these objectives, the following research questions were formulated:

1. What profiles can be identified among emerging adults based on mental health variables (anxiety and depression), sense of purpose in life, emotion regulation, and perceived social support?
2. How does loneliness vary across the different behavioral profiles?

1. Methods

1.1. Participants

The sample consisted of 376 subjects aged between 19 and 29 years. The mean age of participants was 21.53 ($SD = 2.46$). The sample comprised 29.3% men and 70.7% women. In terms of educational attainment, most participants were undertaking undergraduate (72.3%) or graduate studies (4.8%), followed by those who had just completed high school (22.9%). Participants were not selected based upon loneliness levels. Loneliness was treated as an outcome variable rather than as a screening variable or an exclusion criterion.

1.2. Measures

Revised UCLA Loneliness Scale (UCLA) (Russell et al., 1980; Spanish version by Expósito & Moya, 1993). This scale consists of 20 items, each rated on a four-point Likert scale (1 = never, 4 = always). Scores range from 20 to 80, with higher scores indicating greater levels of loneliness. The scale demonstrates high internal consistency, with an alpha coefficient of 0.94. The UCLA 20 was selected as a global measure of loneliness, given its strong psychometric properties and its widespread use in educational and intervention settings. As an example, this scale includes items like: (1) how often you feel that the people around you understand you; (7) how often you feel that you have no one close to you; and (14) how often you feel isolated from others.

Generalized Anxiety Disorder 7-item scale, (GAD-7); Spitzer et al., 2006; Garcia-Campayo et al., 2010). It is a screening scale for anxiety disorders consisting of 7 items used to assess the presence of anxiety symptoms over the past two weeks. It employs a 4-point Likert-type response format and allows for a total score of 21 points, enabling differentiation of various levels of intensity. The scale has an internal consistency of 0.92 and a test-retest reliability of 0.83. As an example, this scale includes items like: (1) Have you felt nervous, anxious, or on edge?; (3) Have you worried too much about different things?; (7) Have you been afraid that something terrible might happen?

Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001; Spanish adaptation by Diez-Quevedo et al., 2001). The PHQ-9 is a screening tool for detecting depressive symptoms based on the diagnostic criteria for Major Depressive Disorder in the DSM-IV (American Psychiatric Association, 1994). It consists of nine items assessing the presence of depressive symptoms over the past two weeks, rated on a four-point Likert scale. The total score ranges from 0 to 27, allowing differentiation between various levels of severity. The Spanish adaptation demonstrates good internal consistency ($\alpha = 0.89$). As an example, this scale includes items like: (2) Have you felt down, depressed, or

hopeless?; (3) Have you had trouble falling or staying asleep, or have you slept too much?; (7) Have you had trouble concentrating on things, such as reading the newspaper or watching television?

Purpose-In-Life Test-10 (PIL-10) (García-Alandete, 2014). This is a shortened version of the original PIL (Crumbaugh & Maholick, 1969) designed to measure individuals' perceived meaning in life. It consists of 10 items rated on a seven-point Likert scale (1 to 7, with 4 representing a neutral position), evaluating various dimensions of life purpose, such as enthusiasm, excitement for life, goal clarity, daily novelty, desire for alternative lives, post-retirement activity, appreciation of positive aspects, reason for living, ability to find meaning, and presence of goals. Total scores range from 10 to 70, with higher scores indicating a stronger sense of meaning in life. The Spanish version has high internal consistency ($\alpha = 0.86$), and in this study, an even higher coefficient was obtained ($\alpha = 0.92$). As an example, this scale includes items like; (8) In achieving my life goals; (11) When thinking about my own life; (19) Facing my daily tasks involves.

Multidimensional Scale of Perceived Social Support (MSPSS). (Zimet et al., 1988; Spanish adaptation by Landeta & Calvete, 2002). This scale assesses perceived social support across three domains: family, friends, and a significant other. It comprises 12 items rated on a seven-point Likert scale. The Spanish adaptation of the instrument has strong internal consistency ($\alpha = 0.89$), with similarly high reliability in each subscale: significant others ($\alpha = 0.89$), family ($\alpha = 0.89$), and friends ($\alpha = 0.92$). As an example, this scale includes items like: (1) There is someone close to me when I am in a difficult situation; (3) My family really tries to help me; (7) I can count on my friends when things go wrong.

Emotional Regulation Questionnaire (ERQ). (Gross & John, 2003; Spanish adaptation by Cabello et al., 2013). The ERQ consists of 10 items in which participants indicated their level of agreement regarding how they typically regulate their emotions. Responses are given on a seven-point Likert scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*. The original questionnaire has a two-factor structure: cognitive reappraisal and emotional suppression. The original authors reported Cronbach's alpha reliability indices of 0.79 for cognitive reappraisal and 0.73 for suppression. The Spanish adaptation has demonstrated good psychometric properties, with Cronbach's alpha coefficients of $\alpha = 0.75$ for suppression (with item-total correlations ranging from 0.51 to 0.56) and $\alpha = 0.79$ for reappraisal. As an example, this scale includes items like: (2) I keep my emotions to myself; (6) I control my emotions by not expressing them; (10) When I want to reduce my negative emotions, I change the way I think about the situation.

Table 1 reports the reliability coefficients for all instruments used, presented as McDonald's ω and Cronbach's α with 95% confidence intervals.

1.3. Procedure

This study is embedded within a larger research project of Loneliness

Table 1
McDonald's ω and Cronbach's α coefficients of the measurements scores.

	ω (LL-UL 95% CI)	α (LL-UL 95% CI)
GAD7	0.89 (0.87–0.90)	0.88 (0.86–0.90)
PHQ9	0.85 (0.83–0.87)	0.85 (0.82–0.87)
UCLA	0.93 (0.92–0.94)	0.93 (0.92–0.94)
PIL-10	0.91 (0.90–0.93)	0.91 (0.89–0.92)
ERQ Suppression Subscale	0.79 (0.75–0.82)	0.77 (0.73–0.81)
MSPSS Family	0.95 (0.94–0.96)	0.94 (0.93–0.95)
MSPSS Friends	0.87 (0.85–0.89)	0.86 (0.84–0.88)
MSPSS Significant Others	0.93 (0.91–0.94)	0.93 (0.91–0.94)

Note. GAD7 = Generalized Anxiety Disorder 7-item scale. PHQ9 = Patient Health Questionnaire9. UCLA = University of California, Los Angeles. PIL-10 = Purpose-In-Life Test-10. ERQ = Emotional Regulation Questionnaire. MSPSS = Multidimensional Scale of Perceived Social Support.

in Emerging Adulthood. The research project was approved by the Research Ethics Committee of the xxxxxx. A questionnaire booklet was designed using Google Forms, generating a link that allowed participants to access it directly. Subsequently, faculty members from four public and private universities located in Andalusia and the Valencian Community were contacted. The study was explained to faculty deans, who gave permission to contact students to offer them to participate. Then, we explained the students the project, the objectives, and provided them with the inform consent form and encouraged them to participate. Participants received a link to the online questionnaire. To ensure accessibility for all students, instructors were asked to share the link through their respective educational platforms and to extend an open invitation to participate as needed. No incentives were offered for participation in the study. Participation was anonymous and voluntary. Before completing the questionnaires, participants signed an informed consent form, confirming that they had received information about the project and agreed to take part in the study. To ensure anonymity and data confidentiality, each participant was assigned a research code, and all sensitive information was removed from the database.

1.4. Data analysis

The data set was complete, thus no methods to handle missing data were used. All analysis was run using JASP 0.19.0 (JASP Team, 2024). A comprehensive approach was employed to examine the relationships and differences among various psychological constructs. K-means cluster analysis (Hartigan & Wong, 1979) was conducted to identify distinct profiles based on seven key variables: anxiety; depression; emotional suppression; purpose in life; and family, friends, and significant others perceived social support. To determine the optimal number of clusters, a series of clustering validity indices and model fit criteria were examined across solutions ranging from two to five clusters. Specifically, the analysis considered the R^2 coefficient, Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Silhouette coefficient, Pearson's γ , Dunn index, maximum cluster diameter, minimum separation, entropy, and the Calinski-Harabasz index (Arbelaitz et al., 2013; Hennig, 2007; Liu et al., 2010). While the R^2 , AIC, and BIC indices improved progressively with increasing cluster numbers, solutions with four or more clusters exhibited diminishing cluster separation, higher entropy, and lower cluster cohesion, as indicated by declines in the Silhouette and Calinski-Harabasz indices. The two-cluster solution displayed the highest Silhouette and Calinski-Harabasz scores but lacked the granularity needed for theoretical interpretation. The three-cluster solution provided the best overall trade-off between model fit and cluster validity, with strong internal cohesion (Silhouette = 0.27; Dunn index = 0.103), acceptable separation (Pearson's $\gamma = 0.575$; min separation = 0.710), and relatively low entropy (0.959). This solution also facilitated more meaningful theoretical differentiation across clusters (Hennig, 2007; Sugar & James, 2003). Therefore, the three-cluster solution was selected as the most robust and interpretable model for subsequent analyses (Table 2).

Table 2
Comparison of resulting K-means clusters summary and information.

Number of clusters	2	3	4	5
N	376	376	376	376
R^2	0.295	0.390	0.458	0.505
AIC	1.879.260	1.642.360	1.478.820	1.369.760
BIC	1.934.280	1.724.880	1.588.850	1.507.300
Silhouette	0.300	0.270	0.180	0.170
Maximum diameter	8.457	6.909	6.824	6.589
Minimum separation	0.592	0.710	0.329	0.329
Pearson's γ	0.536	0.575	0.463	0.439
Dunn index	0.070	0.103	0.048	0.050
Entropy	0.654	0.959	1.319	1.549
Calinski-Harabasz index	156.314	119.407	104.771	94.568

Following this clustering approach, Standardized UCLA loneliness scores (i.e., z-scores) were computed to classify participants' degree of loneliness, using the means and standard deviations reported for men ($M = 45.02$, $SD = 12.16$) and women ($M = 45.40$, $SD = 14.89$) in the original Spanish validation study (Vázquez Morejón & García-Bóveda, 1994). Z-scores were calculated using the following formula (Field, 2013):

$$z = \frac{X - \mu}{\sigma}.$$

A chi-square test of independence was conducted to examine the association between cluster membership and participants' degree of loneliness, as classified by standardized z-score categories (i.e., $-2 < z < -1$, $-1 < z < 1$, $1 < z < 2$, and $z > 2$).

Additionally, descriptive statistics were calculated to provide an overview of the sample, including means, standard deviations, and the minimum and maximum scores for each of the measured variables.

A post hoc power analysis was conducted to estimate the statistical sensitivity of the inferential tests performed. Given that k-means cluster analysis is an exploratory, non-inferential technique, statistical power was calculated based on the Chi-squared analysis used to examine associations between the three identified clusters and the loneliness severity degree categories.

A post hoc statistical power analysis was conducted using parameters equivalent to those implemented in G*Power (see Faul et al., 2007). Assuming a chi-square test with an alpha level of 0.05, a moderate effect size (Cohen's $w = 0.15$; Cohen, 1988), and a total sample size of $N = 376$, the estimated statistical power was approximately 0.83. This value exceeds the conventional threshold of 0.80, which is widely recommended as an adequate level of statistical power in behavioral research (Cohen, 1988). Therefore, the study can be considered sufficiently powered to detect effects of this magnitude, reducing the likelihood of Type II error and supporting the robustness of the findings.

2. Results

The k-means cluster analysis identified three distinct subgroups within the sample ($N = 376$) based on seven variables: anxiety (GAD-7), depression (PHQ-9), emotional suppression (ERQ), social support (family, friends, and significant others), and purpose in life (PIL-R). A three-cluster solution emerged ($BIC = 1724.88$), accounting for 39.0% of the variance ($R^2 = 0.39$) with a silhouette score of 0.27, suggesting moderate cluster separation. Cluster validity indices showed moderate clustering, with a maximum within-cluster diameter of 6.91, minimum separation of 0.71, Pearson's γ correlation of 0.57, and Dunn index of 0.10. The Calinski-Harabasz index (119.41) supported the adequacy of the three-cluster solution. Fig. 2 shows the t-SNE Cluster Plot.

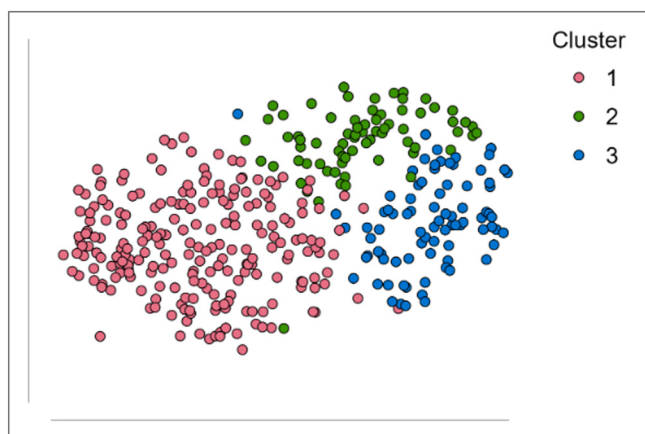


Fig. 2. t-SNE cluster plot.

Cluster 1, the largest subgroup ($n = 222$), accounted for 44.7% of within-cluster heterogeneity ($WSS = 715.16$). Participants in this group showed low mean values for anxiety, depression, and emotional suppression, alongside positive scores on perceived social support and life purpose, indicating relatively low levels of distress and a supportive social environment (Table 3).

Cluster 2 ($n = 71$) explained 23.0% of within-cluster heterogeneity ($WSS = 368.25$), characterized by low scores across perceived social support and slightly negative scores in anxiety, depression, and purpose in life, but with positive emotional suppression scores. These participants reported limited social support and mild psychological distress, with reliance on emotional suppression as a regulatory strategy.

Cluster 3 ($n = 83$) accounted for 32.3% of within-cluster heterogeneity ($WSS = 516.96$) and demonstrated high positive means for anxiety and depression, with negative scores on family and significant others' support, and life purpose. This group showed higher distress levels and reduced support and purpose, indicating a potential need for targeted interventions. Table 4 shows the center means for each of the clusters.

A chi-square test of independence revealed a significant association between cluster membership and loneliness degree (based on standardized UCLA scores), $\chi^2(6, N = 376) = 53.05$, $p < .001$ (See Table 5). The effect size was moderate (contingency coefficient, $C = 0.35$), indicating a meaningful relationship between cluster classification and loneliness severity. This magnitude reflects a practically meaningful association, indicating that the clustering structure captures substantive differences in loneliness severity rather than trivial group distinctions. Individuals with average and below-average loneliness were disproportionately represented in Cluster 1, whereas those with above-average and extreme loneliness were more likely to be classified into Clusters 2 and 3. Notably, all participants with extreme loneliness ($z > 2$) belonged to Cluster 3. Collectively, these findings support the validity of the cluster solution, demonstrating that cluster membership captures distinct psychosocial profiles that systematically vary as a function of loneliness severity.

3. Discussion

This study aimed to examine the behavioral profiles of emerging adults through a K-means cluster analysis, considering psychological variables such as anxiety, depression, sense of life purpose, emotion regulation through suppression, and perceived social support from family, friends, and significant others. Additionally, differences in reported loneliness scores were analyzed according to the group to which participants were assigned after the K-means cluster analysis.

The choice of the three-cluster solution was further supported by theoretical and empirical considerations. In line with best practices for clustering analysis in social and behavioral sciences (Hennig, 2007; Sugar & James, 2003), solutions with fewer clusters (e.g., two) were found to oversimplify the data structure, limiting interpretability and reducing theoretical richness. Conversely, solutions with four or more clusters, while offering marginal improvements in explained variance, exhibited poorer cluster separation and higher entropy, suggesting possible overfitting and instability (Arbelaitz et al., 2013). The three-cluster solution balanced these trade-offs, yielding clusters with sufficient cohesion and distinctiveness while maintaining interpretability in line with the study's conceptual framework (Liu et al., 2010). This approach is consistent with recommendations for ensuring both statistical rigor and theoretical contribution (Hennig, 2007).

Results support the understanding of loneliness as a multifaceted construct associated with variables such as anxiety, depression, emotion regulation, and life purpose, each relating differently to an individual's experience of loneliness (Boreham & Schutte, 2023; Nielsen et al., 2024). Participants in Cluster 1 scored higher in life purpose and perceived social support from family, friends, and significant others, alongside lower scores in anxiety and depression and less reliance on suppression as an emotion regulation strategy. These findings align with

Table 3

Descriptive statistics of the study variables.

	Overall (N = 376)		Cluster 1 (n = 222)		Cluster 2 (n = 71)		Cluster 3 (n = 83)	
	M ± SD	Min - Max	M ± SD	Min - Max	M ± SD	Min - Max	M ± SD	Min - Max
Anxiety	7.83 ± 4.73	0.00–21.00	6.04 ± 3.49	0.00–18.00	6.41 ± 3.22	1.00–16.00	13.82 ± 3.73	3.00–21.00
Depression	8.54 ± 5.33	0.00–27.00	6.10 ± 3.48	0.00–17.00	7.87 ± 3.86	1.00–19.00	15.61 ± 4.17	8.00–27.00
Suppression of emotion	15.54 ± 5.51	4.00–28.00	14.05 ± 5.34	4.00–28.00	18.44 ± 4.58	6.00–28.00	17.02 ± 5.36	5.00–27.00
Family support	21.28 ± 6.72	4.00–28.00	25.05 ± 3.51	4.00–28.00	16.28 ± 5.78	6.00–28.00	15.47 ± 7.12	4.00–28.00
Friends support	23.51 ± 5.01	5.00–28.00	25.72 ± 2.71	15.00–28.00	17.04 ± 5.42	5.00–28.00	23.13 ± 4.51	7.00–28.00
Significant other support	23.11 ± 4.94	4.00–28.00	25.37 ± 3.10	14.00–28.00	17.59 ± 4.76	5.00–28.00	21.80 ± 4.94	4.00–28.00
Purpose in life	52.16 ± 10.56	10.00–70.00	57.28 ± 6.41	36.00–70.00	48.54 ± 9.12	24.00–67.00	41.58 ± 11.54	10.00–65.00
Loneliness	41.72 ± 11.11	20.00–73.00	36.15 ± 8.41	20.00–60.00	48.31 ± 9.64	28.00–69.00	50.96 ± 9.27	29.00–73.00

Table 4

Cluster center means.

	Cluster means		
	1 (n = 222)	2 (n = 71)	3 (n = 83)
Anxiety	−0.378	−0.300	1.267
Depression	−0.457	−0.125	1.328
Suppression of emotion	−0.269	0.526	0.270
Purpose in life	0.561	−0.744	−0.864
Perceived social support			
Family	0.441	−1.291	−0.075
Friends	0.457	−1.118	−0.266
Significant others	0.484	−0.343	−1.002

previous literature, which has emphasized high perceived social support and a sense of life purpose as critical protective factors against loneliness (Özdoğan, 2021; Pfund & Miller-Perrin, 2019). The perception of having people to rely on suggests that this group possesses a meaningful social network capable of providing emotional support in times of difficulty, fostering a sense of belonging and emotional well-being. Additionally, effectively managing emotions while avoiding emotional suppression has been associated with better interpersonal relationships (Cameron & Overall, 2018).

Furthermore, having a strong sense of purpose in life, with clear goals and aspirations, has been associated with better mental health outcomes in previous studies. In fact, these findings align with previous research indicating that a higher sense of purpose is associated with lower levels of anxiety and depression (Fonte et al., 2024) and may even serve as a protective factor, particularly against depression (Barcaccia et al., 2023; Park et al., 2020; Szczesniak et al., 2022). While causality cannot be established between these variables, it can be concluded that this group's profile includes factors such as social support and a sense of purpose, which have been associated with lower levels of loneliness and higher levels of well-being.

Participants in Cluster 2 reported the lowest levels of social support from friends and significant others compared to the other clusters and also had similarly low levels of family support as Cluster 3. Additionally, they reported a low sense of purpose in life and the highest scores for emotional suppression, along with symptoms of anxiety and depression. This greater reliance on emotional suppression suggests that these individuals may lack essential social skills—or even interest—in

developing meaningful interpersonal relationships. This tendency could be exacerbated by their increased use of suppression, a mechanism that may hinder authentic social connections (Yang et al., 2023). Moreover, emotional suppression has been linked to higher levels of anxiety and depressive symptoms (Dryman & Heimberg, 2018). Loneliness levels in Cluster 2 were significantly higher than in Cluster 1, highlighting the association between lower perceived social support and higher levels of loneliness, even among individuals with milder mental health challenges (Mobach et al., 2024). Taken together, these characteristics—low sense of purpose, reduced social support, and high emotional suppression—appear to converge in elevated and persistent levels of loneliness, positioning it as the central outcome of this profile.

Cluster 3 represents a high-risk profile characterized by elevated levels of anxiety and depressive symptoms, significantly low levels of purpose in life, and poor perceived social support, particularly from family but also from friends and significant others. The high loneliness scores within this cluster highlight the strong association between a lack of purpose in life, limited social support, and mental health struggles, reinforcing loneliness as the central outcome in this high risk group.

Additionally, our results highlight the presence of significantly high scores in anxiety and depression alongside emotional suppression. These findings align with recent studies suggesting that emotional suppression is associated with higher levels of depressive symptoms (Gökdağ et al., 2024). In this high risk profile, elevated loneliness scores appear to be sustained by the co-occurrence of low sense of purpose, poor social support, and maladaptive emotion regulation, further underscoring loneliness as the central outcome of interest.

When analyzing the use of emotional suppression in Clusters 2 and 3, we observed that individuals who reported using suppression more frequently also reported lower levels of anxiety and depressive symptoms (Cluster 2). This could indicate that these individuals employ tended to employ suppression as a coping strategy in response to feelings of shame or fear of rejection. While in the short term, this strategy may be associated with lower levels of anxiety, in the medium to long term it may be associated with poorer social interactions and lower perceived and received social support. These findings are consistent with current theories on loneliness (e.g., Cacioppo & Hawkley, 2009), which suggest that individuals experiencing high levels of loneliness tend to be cognitively hypervigilant toward potential social threats. This predisposition is associated with the anticipation of negative social interactions, which in turn reinforces social avoidance behaviors.

Table 5

Association between cluster membership and loneliness severity (standardized UCLA scores).

Loneliness degree	Clusters			Total	Mode	Median	M (SD)	Min-Max	χ^2	df	p	C
	3	1	2									
−2 > z > −1	5	64	3	72	28.24	28.00	29.31 (6.92)	20.00–60.00				
1 > z > −1	67	155	59	281	40.67	42.00	43.42 (8.60)	22.00–65.00	53.05	6	< 0.001	0.35
2 > z > 1	9	3	9	21	63.57	63.00	58.52 (11.12)	29.00–69.00				
z > 2	2	0	0	2	72.99	72.00	72.00 (1.41)	71.00–73.00				
Total	83	222	71	376								

Consequently, this pattern has been associated with higher levels of anxiety and depression, as well as intensifying feelings of isolation and loneliness. These findings suggest that, despite its short term protective function against anxiety, emotional suppression may contribute to sustained patterns of loneliness by weakening social bonds and reducing perceived social support.

The patterns observed in Clusters 2 and 3 align with research such as that of Preece et al. (2021), which examined emotional regulation in loneliness profiles, highlighting a high reliance on emotional suppression and a low tendency to seek social support. Our findings expanded on this by identifying differences within these profiles and analyzing key variables that may explain the distinct types of individuals who experience loneliness. In particular, the sense of purpose in life and perceived social support could emerge as crucial factors in understanding these variations in loneliness.

There is an inverse relationship between the sense of purpose in life and levels of anxiety and depression, as confirmed by various scientific studies (Baquero-Tomás et al., 2023; Boreham & Schutte, 2023). These findings align with other research indicating that individuals with high anxiety scores tend to experience existential emptiness and trust others less, which is associated with poorer interpersonal relationships and perceived social support (Kroplewski et al., 2019). Furthermore, a low sense of purpose in life is associated with reduced ability to recognize and activate coping strategies for anxiety. In contrast, a strong sense of purpose is associated with greater capacity to interpret negative experiences with resilience, despite the inherent challenges they may present (Szcześniak et al., 2022).

Regarding perceived social support, these findings are consistent with prior research that has established a link between low levels of perceived social support and increased loneliness (Gan et al., 2020). Similarly, most studies corroborate the inverse relationship between a sense of purpose in life and loneliness (Sutin et al., 2022). In this way, sense of purpose and perceived social support appear as key variables explaining variability in loneliness across profiles, rather than as outcomes per se.

Participants in clusters 2 and 3 were particularly vulnerable to the detrimental effects of loneliness, as previous studies have shown that anxiety and depression are associated with higher levels of loneliness, possibly co-occurring with difficulties in establishing and maintaining close relationships (Barroso et al., 2019), which were associated with heightened perceptions of inadequate social support. This profile highlights the need for targeted interventions aimed at improving mental health and fostering social support networks for those at high risk of loneliness. In this way, loneliness emerged as the central outcome that captures the convergence of poor mental health and limited social support in these high risk profiles. Moreover, a strong perception of social support has been associated with more adaptive cognitive and emotional processes, which have been associated with the use of coping strategies less likely to negatively impact overall well-being and mental health.

Importantly, the observed moderate association between cluster membership and loneliness degree suggests that while loneliness is strongly embedded within broader psychosocial functioning, it is not entirely determined by it. This finding reinforces contemporary views that loneliness should be understood as a distinct construct with unique cognitive, emotional, and behavioral components (Cacioppo & Hawkley, 2009; Hawkley & Cacioppo, 2010). The clustering solution captured meaningful heterogeneity, distinguishing between individuals who are resilient, socially constrained, or broadly distressed, thereby extending prior work that often treats loneliness as a unidimensional continuum (Holt-Lunstad et al., 2015).

From a theoretical standpoint, these findings support a process-oriented interpretation of loneliness, in which social support, emotional regulation, and meaning in life interact dynamically. High social support and purpose may interrupt the negative feedback loop proposed by Cacioppo, whereas emotional suppression and low support

may exacerbate it (Baumeister & Leary, 1995; Cacioppo & Hawkley, 2009). Thus, loneliness relates not simply to social circumstances, but it is associated with an interplay between interpersonal environments and intrapersonal processes (Hawkley & Cacioppo, 2010).

The relevance of this contribution lies in its examination of loneliness—a highly complex phenomenon—within a vulnerable and understudied population: emerging adults. The transition to adulthood often entails a reduction in family and social connections, as well as exposure to stressful situations related to professional and career development.

This research is not without limitations. First, the sample is intentional and university-based, which could potentially affect the perception of loneliness due to the participants' educational level. Second, the cross-sectional nature of the study prevents the evaluation of future changes that may occur in this construct. Third, the study did not assess social media use, despite the fact that various studies associate it with loneliness. Perceived social support is a key factor associated with loneliness, with higher support linked to lower levels of loneliness. Problematic social media use is associated with greater loneliness, potentially as a compensatory response to limited offline support (O'Day & Heimberg, 2021; Youssef et al., 2020), whereas more positive and relationship-enhancing use may reduce loneliness through increased perceived support (Lin et al., 2020; Nowland, 2026). Although evidence suggests a reciprocal relationship between loneliness and problematic use (Wu et al., 2024), the cross-sectional design of this study limits conclusions to co-occurring associations, particularly in emerging adults where social media play a central social role. Fourth, the data collected from the sample is self-reported, which means it may be subject to perceptual biases from the respondents. It is also important to note that most of the sample consists of women, so some of the findings may be influenced by the predominance of the female gender. Finally, although the UCLA-20 was employed as a global measure of loneliness, the distinction between social and emotional loneliness was addressed only at a conceptual level and not empirically disentangled.

Despite these limitations, we believe that the results of this research have multiple implications for clinical practice and future empirical efforts. In this way, loneliness is positioned as the central outcome that prevention and intervention strategies should primarily target, rather than anxiety or depression alone. Findings suggest that perceived social support and purpose in life were associated with lower loneliness in Group 1, emerging adults at risk for loneliness could benefit from interventions aimed at strengthening social connections and enhancing existential meaning through cognitive interventions that encourage individuals to engage in activities they find valuable. Social programs that promote community involvement, peer relationships, or activities with a defined purpose could be particularly beneficial for individuals in Groups 2 and 3. Furthermore, psychological interventions that encourage adaptive emotional regulation strategies as an alternative to maladaptive strategies, particularly among individuals in Group 2 who rely on suppression, could foster healthier interpersonal interactions and reduce loneliness. In this regard, scientific literature suggests that emotion regulation-based treatment approaches, which have been shown to be effective for psychological distress, could be equally applicable to loneliness. This suggests that strategies used in interventions for anxiety and depression could potentially be adapted to address loneliness, thereby expanding the reach of these interventions (Barlow et al., 2021; Preece et al., 2021). Studies highlight how emotion regulation strategies are crucial for emotional well-being. Understanding the differences in emotional regulation profiles between lonely individuals and those experiencing psychological distress can help identify individuals at risk and develop more effective prevention and treatment programs.

Additionally, this study underscores the existence of distinct profiles of involuntary loneliness, which suggests that a one-size-fits-all approach to addressing loneliness may be insufficient. This finding opens the possibility of tailoring prevention and intervention programs

to the specific characteristics of these loneliness profiles, potentially increasing their effectiveness.

From a broader perspective, the results also had practical implications for managing loneliness in community settings. Identifying potential issues related to loneliness, maladaptive emotion regulation, and social support education on the role these factors play in mental health improvement was associated with decisions about providing education on how these factors are related to mental health improvement (Lyman et al., 2014). Designing interventions that create spaces for emotional expression and intentionally promote social support could be associated with practical benefits in addressing emotional suppression and social disconnection. Moreover, assessing these influential factors could support the implementation of preventive interventions, potentially enabling earlier and more targeted action to mitigate the effects of loneliness (Haslam et al., 2019; Käll et al., 2020).

Future studies should aim to replicate these findings and explore mediating variables within the present study, such as the role of life purpose in relation to loneliness and mental health states (Ho, 2024), as well as social support as a mediator in the relationship between loneliness and mental health (Hutten et al., 2021). Additionally, examining other mediators and moderators within these clusters—such as resilience, self-esteem, or coping styles—could further clarify the factors shaping loneliness in emerging adults. It would also be interesting to examine the relationship between general social media use and problematic social media use with perceived social support, and how both relate to the experience of loneliness in emerging adults. In addition, the relationship between time spent on social media, platform-specific patterns of use, loneliness, and problematic or addictive social media engagement deserves further attention, as do the underlying motives for use that may shape this association (Matthews et al., 2025; Wolgast et al., 2025). Recent meta-analyses of longitudinal studies have shown a bidirectional relationship between loneliness and problematic media use, but they also highlight the importance of considering contextual factors and moderators such as geographical location, type of use or platform, and purpose of use (Fam & Männikkö, 2025). Future longitudinal research in emerging adults would allow us to examine whether the association between loneliness and problematic social media use is truly bidirectional and causal, as suggested by recent findings (Wu et al., 2024).

Longitudinal studies could provide valuable insight by tracking changes in loneliness and mental health over time, particularly as emerging adults navigate significant life transitions. Moreover, complementing the revised UCLA Loneliness Scale with bidimensional measures could allow differentiating profiles by type of loneliness, thereby refining specific interventions.

4. Conclusions

The significance of this research lies in addressing a gap in loneliness studies, which have traditionally focused on older adults while largely overlooking emerging adults. This latter group represents a vital segment of society, with a long trajectory in the workforce that can positively impact the economy. Moreover, loneliness has well-documented negative implications for mental health. Preventing chronic loneliness in emerging adults not only improves their psychological, relational, and emotional well-being but also benefits society. It is therefore crucial for institutions—particularly universities, where emerging adults are highly concentrated—to develop resources for early detection and implement intervention programs that address both affective and cognitive aspects of loneliness. Given that loneliness is a global health concern, universities and similar institutions should play a proactive role in fostering mental health support initiatives. Thus, this study positions loneliness as a central psychological outcome whose early identification and management in emerging adulthood can prevent downstream mental health difficulties.

Consequently, identifying difficulties in emotion regulation, social

disconnection, and loneliness may provide clinicians with key indicators of individuals at risk for developing psychological disorders.

CRedit authorship contribution statement

Alejandro Sanchis-Sanchis: Writing – original draft, Funding acquisition, Conceptualization. **Yolanda Ruiz-Ordóñez:** Writing – review & editing, Supervision, Methodology. **Inmaculada Aragonés Barberá:** Writing – review & editing, Methodology, Conceptualization. **María Dolores Grau Sevilla:** Writing – original draft, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

I have shared the link to my data in the file upload: Cover letter.

References

- Adamczyk, K. (2015). An investigation of loneliness and perceived social support among single and partnered young adults. *Current Psychology*, 35(4), 674–689. <https://doi.org/10.1007/s12144-015-9337-7>
- Adamczyk, K., Zarzycka, B., & Zawada, K. (2022). Daily spiritual experiences and purpose in life: The mediating role of loneliness and moderating role of satisfaction with social and intimate relationships. *Psychology of Religion and Spirituality*, 14(3), 416–423. <https://doi.org/10.1037/rel0000475>
- Akram, U., Irvine, K., Gardani, M., Allen, S., Akram, A., & Stevenson, J. C. (2023). Prevalence of anxiety, depression, mania, insomnia, stress, suicidal ideation, psychotic experiences, & loneliness in UK university students. *Scientific Data*, 10(1). <https://doi.org/10.1038/s41597-023-02520-5>
- Aldao, A. (2012). Emotion regulation strategies as transdiagnostic processes: A closer look at the invariance of their form and function. *Revista de Psicopatología y Psicología Clínica*, 17(3), 261–277. <https://doi.org/10.5944/rppc.vol.17.num.3.2012.11843>
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). American Psychiatric Association.
- Arbelaitz, O., Gurrutxaga, I., Muguerza, J., Pérez, J. M., & Perona, I. (2013). An extensive comparative study of cluster validity indices. *Pattern Recognition*, 46(1), 243–256. <https://doi.org/10.1016/j.patcog.2012.07.021>
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480. <https://doi.org/10.1037/0003-066x.55.5.469>
- Arnold, A. J., & Winkelman, P. (2020). Smile (but only deliberately) though your heart is aching: Loneliness is associated with impaired spontaneous smile mimicry. *Social Neuroscience*, 16, 26–38. <https://doi.org/10.1080/17470919.2020.1809516>
- Aydiner-Boylu, A., Günay, G., & Ersoy, A. F. (2019). Üniversite öğrencilerinde algılanan sosyal desteğin yalnızlık üzerindeki etkisinin incelenmesi. *Sosyoekonomi*, 27(41), 211–221. <https://doi.org/10.17233/sosyoekonomi.2019.03.10>
- Baquero-Tomás, M., Grau, M. D., Moliner, A., & Sanchis-Sanchis, A. (2023). Meaning in life as a protective factor against depression. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1180082>
- Barcaccia, B., Couyoumdjian, A., Di Consiglio, M., Papa, C., Cancellieri, U. G., & Cervin, M. (2023). Purpose in life as an asset for well-being and a protective factor against depression in adolescents. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1250279>
- Barlow, D. H., Curreri, A. J., & Woodard, L. S. (2021). Neuroticism and disorders of emotion: A new synthesis. *Current Directions in Psychological Science*, 30(5), 410–417. <https://doi.org/10.1177/09637214211030253>
- Barroso, S. M., De Oliveira, N. R., & De Andrade, V. S. (2019). Solidão e Depressão: Relações com Características Pessoais e Hábitos de Vida em Universitários. *Psicologia: Teoria e Pesquisa*, 35. <https://doi.org/10.1590/0102.3772e35427>
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Borawski, D. (2022b). The mediating role of positive orientation in the relationship between loneliness and meaning in life. *International Journal of Environmental Research and Public Health*, 19(16), Article 9948. <https://doi.org/10.3390/ijerph19169948>
- Borawski, D. (2022a). When you are lonely, look inside yourself: The moderating role of reflection in the relationship between loneliness and meaning in life. *Personality and Individual Differences*, 194, Article 111662. <https://doi.org/10.1016/j.paid.2022.111662>
- Boreham, I. D., & Schutte, N. S. (2023). The relationship between purpose in life and depression and anxiety: A meta-analysis. *Journal of Clinical Psychology*, 79(12), 2736–2767. <https://doi.org/10.1002/jclp.23576>

- Brailovskaia, J., Bierhoff, H., & Rohmann, E. (2021). Loneliness and depression symptoms: The moderating role of narcissism. *Journal of Affective Disorders Reports*, 6, Article 100264. <https://doi.org/10.1016/j.jadr.2021.100264>
- Brown, K. (2023). Emerging adulthood. In *EBSCO Research Starters: Social sciences and humanities*. EBSCO Information Services. <https://www.ebsco.com/research-starters/social-sciences-and-humanities/emerging-adulthood>
- Buecker, S., Mund, M., Chwastek, S., Sostmann, M., & Luhmann, M. (2021). Is loneliness in emerging adults increasing over time? A preregistered cross-temporal meta-analysis and systematic review. *Psychological Bulletin*, 147(8), 787–805. <https://doi.org/10.1037/bul0000332>
- Cabello, R., Salguero, J. M., Fernández-Berrocal, P., & Gross, J. J. (2013). A Spanish adaptation of the emotion regulation questionnaire. *European Journal of Psychological Assessment*, 29(4), 234–240. <https://doi.org/10.1027/1015-5759/a000150>
- Cacioppo, J. T., & Hawkley, L. C. (2009). Perceived social isolation and cognition. *Trends in Cognitive Sciences*, 13(10), 447–454. <https://doi.org/10.1016/j.tics.2009.06.005>
- Cacioppo, J. T., Hawkley, L. C., Ernst, J. M., Burleson, M. H., Bernston, G. G., Nouriani, B., & Spiegel, D. (2006). Loneliness within a nomological net: An evolutionary perspective. *Journal of Research in Personality*, 40(6), 1054–1085. <https://doi.org/10.1016/j.jrp.2005.11.007>
- Cameron, L., & Overall, N. (2018). Suppression and expression as distinct emotion-regulation processes in daily interactions: Longitudinal and meta-analyses. *Emotion*, 18, 465–480. <https://doi.org/10.1037/emo0000334>
- Cohen, J. (1988). *Statistical power analysis for behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Crumbaugh, J. C., & Maholick, L. T. (1969). *Manual de instrucciones para el Test de Propósito en la Vida*. Munster: Psychometric Affiliates.
- Diez-Quevedo, C., Rangil, T., Sanchez-Planell, L., Kroenke, K., & Spitzer, R. L. (2001). Validation and utility of the patient health questionnaire in diagnosing mental disorders in 1003 general hospital Spanish inpatients. *Psychosomatic Medicine*, 63(4), 679–686. <https://doi.org/10.1097/00006842-200107000-00021>
- Dryman, M., & Heimberg, R. (2018). Emotion regulation in social anxiety and depression: A systematic review of expressive suppression and cognitive reappraisal. *Clinical Psychology Review*, 65, 17–42. <https://doi.org/10.1016/j.cpr.2018.07.004>
- Eagle, D., Hybels, C., & Proeschold-Bell, R. (2019). Perceived social support, received social support, and depression among clergy. *Journal of Social and Personal Relationships*, 36, 2055–2073. <https://doi.org/10.1177/0265407518776134>
- Eldesouky, L., Goldenberg, A., & Ellis, K. (2024). Loneliness and emotion regulation in daily life. *Personality and Individual Differences*, 221, Article 112566. <https://doi.org/10.1016/j.paid.2024.112566>
- Eres, R., Lim, M. H., Lanham, S., Jillard, C., & Bates, G. (2020). Loneliness and emotion regulation: Implications of having social anxiety disorder. *Australian Journal of Psychology*, 73(1), 46–56. <https://doi.org/10.1111/ajpy.12296>
- Exposito, F., & Moya, M. (1993). Validación de la UCLA Loneliness Scale en una muestra española. In F. Loscertales-Abril, & M. Marín-Sánchez (Eds.), *Dimensiones psicosociales de la educación y de la comunicación* (pp. 355–364). Eudema.
- Fam, J. Y., & Männikkö, N. (2025). Loneliness and problematic media use: Meta-analysis of longitudinal studies. *Journal of Medical Internet Research*, 27, Article e60410. <https://doi.org/10.2196/60410>
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage Publications.
- Fonte, C., Sá, D., & Pimentão, C. (2024). Relación entre el sentido de la vida, la ansiedad, la depresión y el estrés en adultos. *Informes Psicológicos*, 24(1). <https://doi.org/10.18566/infpic.v24n1a010>
- Frankl, V. E. (1965). *The doctor and the soul: From psychotherapy to logotherapy*. Vintage Books.
- Frankl, V. E. (2006). *The unheard cry for meaning. Psychotherapy and humanism*. Beacon Press.
- Gabardo-Martins, L., Ferreira, M., & Valentini, F. (2017). Psychometric properties of the multidimensional scale of perceived social support. *Trends in Psychology*, 25, 1873–1883. <https://doi.org/10.9788/TP2017.4-18PT>
- Gan, S., Ong, L. S., Lee, C. H., & Lin, Y. S. (2020). Perceived social support and life satisfaction of Malaysian Chinese young adults: The mediating effect of loneliness. *The Journal of Genetic Psychology*, 181(6), 458–469. <https://doi.org/10.1080/00221325.2020.1803196>
- García-Alandete, J. (2014). Análisis factorial de una versión española de Purpose-In-Life Test, en función del género y edad. *Pensamiento Psicológico*, 12(1). <https://doi.org/10.11144/javerianacali.ppsi12-1.afve>
- García-Campayo, J., Zamorano, E., Ruiz, M. A., Pardo, A., Perez-Paramo, M., Lopez-Gomez, V., ... Rejas, J. (2010). Cultural adaptation into Spanish of the generalized anxiety disorder-7 (GAD-7) scale as a screening tool. *Health and Quality of Life Outcomes*, 8(1), 8. <https://doi.org/10.1186/1477-7525-8-8>
- Gökdağ, C., Peker, M., & Akkuş, K. (2024). Expressive suppression and cognitive reappraisal pathways from social anxiety to depression: A six-month longitudinal study. *Personality and Individual Differences*, 229, Article 112757. <https://doi.org/10.1016/j.paid.2024.112757>
- Groarke, J., Berry, E., Graham, L., McKenna, P., McGlinchey, E., & Armour, C. (2020). Loneliness in the UK during the COVID-19 pandemic: Cross-sectional results from the COVID-19 psychological wellbeing study. *PLoS One*, 15(9), Article e0239698. <https://doi.org/10.1371/journal.pone.0239698>
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, 39, 281–291. <https://doi.org/10.1017/S0048577201393198>
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85(2), 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>
- Haber, M., Cohen, J., Lucas, T., & Baltes, B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology*, 39, 133–144. <https://doi.org/10.1007/S10464-007-9100-9>
- Hartigan, J. A., & Wong, M. A. (1979). Algorithm AS 136: A K-means clustering algorithm. *Applied Statistics*, 28(1), 100–108. <https://doi.org/10.2307/2346830>
- Haslam, S. A., Haslam, C., Jetten, J., Cruwys, T., & Bentley, S. (2019). Group life shapes the psychology and biology of health: The case for a sociopsychobio model. *Social and Personality Psychology Compass*, 13(8). <https://doi.org/10.1111/spc3.12490>
- Hawkey, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine*, 40(2), 218–227. <https://doi.org/10.1007/s12160-010-9210-8>
- Hennig, C. (2007). Cluster-wise assessment of cluster stability. *Computational Statistics & Data Analysis*, 52(1), 258–271.
- Ho, T. T. Q. (2024). Loneliness and depressive symptoms: Moderation and mediation model. *American Journal of Health Education*, 1–10. <https://doi.org/10.1080/19325037.2023.2297284>
- Holt-Lunstad, (2017). The potential public health relevance of social isolation and loneliness: Prevalence, epidemiology, and risk factors. *Public Policy & Aging Report*, 27(4), 127–130. <https://doi.org/10.1093/ppar/prx030>
- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science*, 10(2), 227–237. <https://doi.org/10.1177/1745691614568352>
- Hutten, E., Jongen, E. M. M., Vos, A. E. C. C., Van Den Hout, A. J. H. C., & Van Lankveld, J. D. M. (2021). Loneliness and mental health: The mediating effect of perceived social support. *International Journal of Environmental Research and Public Health*, 18(22), Article 11963. <https://doi.org/10.3390/ijerph182211963>
- Ingram, I., Kelly, P. J., Deane, F. P., Baker, A. L., Goh, M. C., Raftery, D. K., & Dingle, G. A. (2020). Loneliness among people with substance use problems: A narrative systematic review. *Drug and Alcohol Review*, 39(5), 447–483. <https://doi.org/10.1111/dar.13064>
- Jankowiak, B., Soroko, E., Kuryś-Szyncel, K., Jaskulska, S., Hill, C. T., Sawaumi, T., ... Watanabe, Y. (2025). Building bridges between Arnett's and Havighurst's theories: New developmental tasks in emerging adulthood across six countries. *Emerging Adulthood*. <https://doi.org/10.1177/21676968251322822>
- JASP Team. (2024). *JASP (Version 0.19.0) [Computer software]*.
- Käll, A., Backlund, U., Shafraan, R., & Andersson, G. (2020). Lonesome no more? A two-year follow-up of internet-administered cognitive behavioral therapy for loneliness. *Internet Interventions*, 19, Article 100301. <https://doi.org/10.1016/j.invent.2019.100301>
- Kearns, S. M., & Creaven, A. M. (2017). Individual differences in positive and negative emotion regulation: Which strategies explain variability in loneliness? *Personality and Mental Health*, 11(1), 64–74. <https://doi.org/10.1002/pmh.1363>
- Kirwan, E. M., O'Suilleabháin, P. S., Burns, A., Ogoro, M., Allen, E., & Creaven, A. (2023). Exploring loneliness in emerging adulthood: A qualitative study. *Emerging Adulthood*, 11(6), 1433–1445. <https://doi.org/10.1177/21676968231194380>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9. *Journal of General Internal Medicine*, 16(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- Kropiewski, Z., Serocka, A., & Szczesniak, M. (2019). Social support and sense of life in patients with anxiety disorders – Preliminary report. *Psychiatria Polska*, 53(2), 313–324. <https://doi.org/10.12740/pp/81447>
- Landeta, O., & Calvete, E. (2002). Adaptación y validación de la Escala Multidimensional de Apoyo Social Percibido. *Ansiedad y Estrés*, 8, 173–182.
- Lin, S., Liu, D., Niu, G., & Longobardi, C. (2020). Active social network sites use and loneliness: The mediating role of social support and self-esteem. *Current Psychology*, 41(3), 1279–1286. <https://doi.org/10.1007/s12144-020-00658-8>
- Liu, Y., Li, Z., Xiong, H., Gao, X., & Wu, J. (2010). *Understanding of internal clustering validation measures*. Proceedings of the 2010 IEEE international conference on data mining (ICDM) (pp. 911–916). <https://doi.org/10.1109/ICDM.2010.35>
- Lopes, P. N., Salovey, P., Côté, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion*, 5(1), 113–118. <https://doi.org/10.1037/1528-3542.5.1.113>
- Lyman, D. R., Braude, L., George, P., Dougherty, R. H., Daniels, A. S., Ghose, S. S., & Delphin-Rittmon, M. E. (2014). Consumer and family psychoeducation: Assessing the evidence. *Psychiatric Services*, 65, 416–428. <https://doi.org/10.1176/appi.ps.201300266>
- Macià, D., Cattaneo, G., Solana, J., Tormos, J. M., Pascual-Leone, A., & Bartrés-Faz, D. (2021). Meaning in life: A major predictive factor for loneliness comparable to health status and social connectedness. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.627547>
- Main, A., Yung, S. T., Chen, Y., & Zawadzki, M. J. (2025). Predicting emotion regulation strategies from aspects of the social context in everyday life. *Journal of Social and Personal Relationships*. <https://doi.org/10.1177/02654075241302345>
- Marco, J. H., Alonso, S., & Baños, R. (2020). Meaning-making as a mediator of anxiety and depression reduction during cognitive behavioral therapy intervention in participants with adjustment disorders. *Clinical Psychology & Psychotherapy*, 28, 325–333. <https://doi.org/10.1002/cpp.2506>
- Martela, F., & Steger, M. F. (2016). The three meanings of meaning in life: Distinguishing coherence, purpose, and significance. *The Journal of Positive Psychology*, 11, 531–545. <https://doi.org/10.1080/17439760.2015.1137623>
- Matthews, T., Arseneault, L., Bryan, B. T., Fisher, H. L., Gray, R., Henchy, J., ... Odgers, C. L. (2025). Social media use, online experiences, and loneliness among

- young adults: A cohort study. *Annals of the New York Academy of Sciences*, 1548, 194–205. <https://doi.org/10.1111/nyas.15370>
- Mobach, L., Wolters, N. E., Klein, A. M., Koelen, J. A., Vonk, P., Van der Heijde, ... Wiers, R. W. (2024). Temporal associations of emotional and social loneliness and psychosocial functioning in emerging adulthood. *Scandinavian Journal of Psychology*, 65(6), 1141–1152. <https://doi.org/10.1111/sjop.13056>
- Mwilambwe-Tshilobo, L., Ge, T., Chong, M., Ferguson, M. A., Misić, B., Burrow, A. L., ... Spreng, R. N. (2019). Loneliness and meaning in life are reflected in the intrinsic network architecture of the brain. *Social Cognitive and Affective Neuroscience*, 14(4), 423–433. <https://doi.org/10.1093/scan/nsz021>
- Neville, S., Adams, J., Montayre, J., Larmer, P., Garrett, N., Stephens, C., & Alpass, F. (2018). Loneliness in men 60 years and over: The association with purpose in life. *American Journal of Men's Health*, 12(4), 730–739. <https://doi.org/10.1177/1557988318758807>
- Nielsen, B. K., Nielsen, L. A., & Lasgaard, M. (2024). Loneliness in emerging adulthood: A qualitative study using cultural probes and in-depth interviews. *Current Research in Behavioral Sciences*, 7, Article 100154. <https://doi.org/10.1016/j.crbeha.2024.100154>
- Nowland, R. (2026). Understanding the association between loneliness and social media: A revised theoretical model. *Current Opinion in Behavioral Sciences*, 69, Article 101653. <https://doi.org/10.1016/j.crbeha.2026.101653>
- O'Day, E. B., & Heimberg, R. G. (2021). Social media use, social anxiety, and loneliness: A systematic review. *Computers in Human Behavior Reports*, 3, Article 100070. <https://doi.org/10.1016/j.chbr.2021.100070>
- Orozco-Vargas, A. E. (2022). Soledad y ansiedad durante el confinamiento por COVID-19. El efecto mediador de la regulación emocional. *Interdisciplinaria: Revista de Psicología y Ciencias Afines*, 39(2), 335–354. <https://doi.org/10.16888/interd.2022.39.2.21>
- Özdoğan, A.Ç. (2021). Subjective well-being and social-emotional loneliness of university students: The mediating effect of the meaning of life. *Journal of Pedagogical Research*, 5(1), 18–30. <https://doi.org/10.33902/jpr.2021066865>
- Park, C. L., Knott, C. L., Williams, R. M., Clark, E. M., Williams, B. R., & Schulz, E. (2020). Meaning in life predicts decreased depressive symptoms and increased positive affect over time but does not buffer stress effects in a National Sample of African-Americans. *Journal of Happiness Studies*, 21(8), 3037–3049. <https://doi.org/10.1007/s10902-019-00212-9>
- Pfund, G. N., & Miller-Perrin, C. (2019). Interaction and harmony in faith communities: Predicting life purpose, loneliness, and well-being among college students. *Journal of College and Character*, 20(3), 234–253. <https://doi.org/10.1080/2194587x.2019.1631186>
- Preece, D. A., Goldenberg, A., Becerra, R., Boyes, M., Hasking, P., & Gross, J. J. (2021). Loneliness and emotion regulation. *Personality and Individual Differences*, 180, Article 110974. <https://doi.org/10.1016/j.paid.2021.110974>
- Przepiorka, A. (2012). The relationship between attitude toward time and the presence of meaning in life. *International Journal of Applied Psychology*, 2, 22–30. <https://doi.org/10.5923/j.ijap.20120203.02>
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39(3), 472–480. <https://doi.org/10.1037//0022-3514.39.3.472>
- Silva, C. O. (2020). In the eyes of others: Loneliness and relational meaning in life among Japanese college students. *Transcultural Psychiatry*, 57(5), 623–634. <https://doi.org/10.1177/1363461519899757>
- SoledadES, Observatorio Estatal de la Soledad No Deseada, Fundación ONCE, & Fundación AXA. (2024). Informe Barómetro de la soledad no deseada en España 2024. https://www.soledades.es/sites/default/files/contenidos/Informe_Barometro%20soledad-v2.pdf
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine*, 166(10), 1092. <https://doi.org/10.1001/archinte.166.10.1092>
- Sugar, C. A., & James, G. M. (2003). Finding the number of clusters in a dataset: An information-theoretic approach. *Journal of the American Statistical Association*, 98(463), 750–763. <https://doi.org/10.1198/016214503000000666>
- Sutin, A. R., Luchetti, M., Aschwanden, D., Lee, J. H., Sesker, A. A., Stephan, Y., & Terracciano, A. (2022). Sense of purpose in life and concurrent loneliness and risk of incident loneliness: An individual-participant meta-analysis of 135,227 individuals from 36 cohorts. *Journal of Affective Disorders*, 309, 211–220. <https://doi.org/10.1016/j.jad.2022.04.084>
- Szczęśniak, M., Falewicz, A., Stochalska, K., & Rybarski, R. (2022). Anxiety and depression in a non-clinical sample of young Polish adults: Presence of meaning in life as a mediator. *International Journal of Environmental Research and Public Health*, 19(10), Article 6065. <https://doi.org/10.3390/ijerph19106065>
- Vázquez Morejón, A. J., & García-Bóveda, R. (1994). RULS: Escala de soledad UCLA revisada. Fiabilidad y validez de una versión española. *Journal of Health Psychology*, 6(1).
- Wang, J., Lloyd-Evans, B., Giacco, D., Forsyth, R., Nebo, C., Mann, F., & Johnson, S. (2017). Social isolation in mental health: A conceptual and methodological review. *Social Psychiatry and Psychiatric Epidemiology*, 52, 1451–1461. <https://doi.org/10.1007/s00127-017-1446-1>
- Wang, J., Mann, F., Lloyd-Evans, B., Ma, R., & Johnson, S. (2018). Associations between loneliness and perceived social support and outcomes of mental health problems: A systematic review. *BMC Psychiatry*, 18(1). <https://doi.org/10.1186/s12888-018-1736-5>
- Wolgast, M., Adler, H., & Wolgast, S. N. (2025). Motives for social media use in adults: Associations with platform-specific use, psychological distress, and problematic engagement. *Journal of Social Media Research*, 2(3), 179–194. <https://doi.org/10.29329/jsomer.45>
- Wolters, N. E., Mobach, L., Wuthrich, V. M., Vonk, P., Van Der Heijde, C. M., Wiers, R. W., ... Klein, A. M. (2023). Emotional and social loneliness and their unique links with social isolation, depression and anxiety. *Journal of Affective Disorders*, 329, 207–217. <https://doi.org/10.1016/j.jad.2023.02.096>
- Wong, P. T. P. (1989). Personal meaning and successful aging. *Canadian Psychology/Psychologie Canadienne*, 30, 516–525. <https://doi.org/10.1037/h0079829>
- Wu, P., Feng, R., & Zhang, J. (2024). The relationship between loneliness and problematic social media usage in Chinese university students: A longitudinal study. *BMC Psychology*, 12(1), 13. <https://doi.org/10.1186/s40359-023-01498-4>
- Yang, M., Wei, W., Ren, L., Pu, Z., Zhang, Y., Li, Y., ... Wu, S. (2023). How loneliness linked to anxiety and depression: A network analysis based on Chinese university students. *BMC Public Health*, 23(1). <https://doi.org/10.1186/s12889-023-17435-4>
- Youssef, L., Hallit, R., Kheir, N., Obeid, S., & Hallit, S. (2020). Social media use disorder and loneliness: Any association between the two? Results of a cross-sectional study among Lebanese adults. *BMC Psychology*, 8(1), 56. <https://doi.org/10.1186/s40359-020-00421-5>
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30–41. https://doi.org/10.1207/s15327752jpa5201_2