LONELINESS, SOCIAL SUPPORT AND PSYCHOLOGICAL DISTRESS AS CORRELATES OF EMOTIONAL-RELATIONAL ENGAGEMENT WITH CONVERSATIONAL AI

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ABSTRACT
Conversational AI is increasingly used not only for information seeking but also for emotional and relational purposes. This study examined the associations between emotional-relational engagement with conversational AI, psychological distress, loneliness, and perceived social support in 138 Italian university students. Emotional-relational engagement was associated with greater psychological vulnerability and lower perceived social support, while conversational AI was primarily perceived as a psychologically safe, non-judgmental space rather than a substitute for human relationship.

KEYWORDS
conversational artificial intelligence; emotional-relational engagement; loneliness; perceived social support; psychological distress; university students.

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1. Introduction

Conversational artificial intelligence has progressively evolved from information-oriented systems into socially responsive agents capable of sustaining prolonged, personalized and context-sensitive interactions. While these systems were initially developed to facilitate information retrieval, task completion and decision support, advances in large language models have expanded their communicative capabilities, enabling interactions that increasingly resemble interpersonal conversations. Today, conversational AI is widely employed for educational, professional, creative and problem-solving purposes, but users also engage with these systems for reflection, emotional expression and companionship.

This transformation has contributed to the emergence of conversational AI not merely as a functional technology but as a potential relational partner for some users. Dedicated AI companion platforms such as Replika and Character.AI, together with the conversational capabilities of general-purpose large language models, have encouraged forms of interaction extending beyond instrumental assistance toward ongoing socioemotional exchanges (Laestadius et al., 2024). Rather than being limited to answering questions or completing tasks, these systems can maintain conversational continuity, adapt their communication style, recall previous interactions, and generate responses perceived as empathic, attentive, and emotionally contingent. Such characteristics have progressively blurred the traditional distinction between instrumental and relational technology use. (Banks, 2026; McStay, 2018; Lewis & Sarkadi, 2024).

Several features appear particularly relevant in fostering users´ emotional involvement. Conversational AI offers continuous availability, immediate responsiveness, and interactions that are often experienced as non-judgmental

and psychologically safe. Moreover, recent work suggests that contemporary conversational agents are increasingly capable of adapting linguistically and emotionally to users´ communication styles, producing experiences of perceived understanding, active listening, and interpersonal attachment. These interactional dynamics may facilitate self- disclosure, emotional reflection, and the perception of being genuinely heard, even when users are fully aware that they are interacting with an artificial system (Abd-Alrazaq et al., 2021; Liu et al., 2024; Singh et al., 2022). Consequently, a growing body of literature has begun to conceptualize human–AI interaction using relational frameworks traditionally reserved for interpersonal relationships. Recent studies have examined conversational AI through the lenses of companionship, attachment, and socioemotional connection, suggesting that, for at least some individuals, these interactions may acquire intrinsic relational significance rather than remaining exclusively instrumental. In this perspective, Banks (2026) conceptualizes machine companionship as an unfolding relational experience characterized by coordinated interaction, subjective positive value, and continuity over time, rather than as a simple product feature. Similarly, Yang and Oshio (2025) propose that attachment theory offers a useful framework for understanding human–AI relationships, arguing that conversational AI may partially fulfill two core attachment functions: serving as a safe haven, to which users turn for comfort and emotional reassurance during moments of distress, and as a secure base, from which they can explore thoughts, emotions, and everyday challenges while feeling psychologically supported. Together, these perspectives suggest that conversational AI may acquire genuine relational significance for some users, extending beyond its purely instrumental functions.

2. Psychological Vulnerability and Emotional-Relational Engagement with Conversational AI

If conversational AI can acquire genuine relational significance for some users, an equally important question concerns why this occurs more frequently in certain individuals than in others. Recent research increasingly suggests that emotional engagement with conversational AI cannot be explained solely by the technological characteristics of these systems. Rather, it emerges from the interaction between the relational affordances of conversational agents and the psychological characteristics of their users (Banks, 2026; Yang & Oshio, 2025; Fang et al., 2026). Accordingly, contemporary research has progressively shifted its attention from asking what conversational AI can do to understanding for whom, under which psychological conditions, and through which relational mechanisms these systems acquire emotional significance.

This shift reflects an important theoretical evolution. Early studies primarily examined conversational AI as a technological tool capable of providing information, assistance, or emotional support (Abd-Alrazaq et al., 2021; McStay, 2018). More recent perspectives instead conceptualize emotionally meaningful human–AI interaction as a relational phenomenon that develops through repeated exchanges between users and artificial agents. Within this framework, companionship is no longer understood as a predefined feature of AI systems but as a subjective relational experience that unfolds over time through coordinated interaction, perceived responsiveness, and intrinsic relational value (Banks, 2026, Banks & Li, 2026). Similarly, attachment theory has recently been proposed as a useful framework for understanding why some individuals experience conversational AI as emotionally significant. Rather than suggesting that AI replaces human attachment figures, Yang and Oshio (2025) argue that conversational agents may partially fulfill attachment-related functions by providing emotional reassurance during distress (safe haven) and

a psychologically supportive context for reflection and exploration (secure base). Importantly, however, these relational experiences appear far from universal. Recent longitudinal evidence demonstrates considerable variability in the ways individuals engage with conversational AI. Users differ substantially in emotional dependence, perceived companionship, problematic use, self-disclosure, and psychosocial outcomes, with these differences being explained more effectively by individual psychological characteristics than by the technological features of conversational systems themselves (Fang et al., 2026). Likewise, Lai et al. (2025) showed that the tendency to use conversational AI for companionship is associated with users`psychological functioning, highlighting loneliness as a key mechanism linking depressive symptoms with emotionally oriented AI interactions. Together, these findings suggest that emotionally meaningful interactions with conversational AI emerge from the interaction between technological affordances and users´pre-existing emotional and relational characteristics rather than from the technology alone. Within this perspective, psychological distress represents one of the most frequently investigated correlates of emotionally oriented AI interactions. Psychological distress encompasses symptoms of depression, anxiety, and stress that may compromise emotional regulation and adaptive coping, increasing the need for accessible opportunities for emotional expression and reassurance. Because conversational AI offers continuous availability, immediate responsiveness, perceived empathy and interactions experienced as non-judgmental, psychologically distressed individuals may perceive these systems as particularly suitable environments for self-disclosure and emotional processing (Abd-Alrazaq et al., 2021; McStay, 2018; Liu et al., 2024; Lewis & Sarkadi, 2024). Qualitative investigations further indicate that conversational agents may facilitate reflective dialogue and emotional

disclosure while creating experiences of perceived understanding and psychological safety (Singh et al., 2022).

Among the various dimensions of psychological vulnerability, loneliness appears to occupy a particularly central position. Unlike social isolation, which refers to the objective absence of interpersonal relationships, loneliness reflects the subjective perception that existing relationships fail to satisfy desired levels of emotional or social connectedness (Perlman & Peplau, 1981; Hawkley & Cacioppo, 2010). Consequently, loneliness may persist even among individuals with apparently adequate social networks. Contemporary theoretical models describe loneliness as a motivational state that increases the search for meaningful social connection and enhances sensitivity to contexts characterized by acceptance, responsiveness, and reduced interpersonal risk. These characteristics closely resemble several interactional features of conversational AI, including constant availability, emotional responsiveness, perceived acceptance, and the absence of social evaluation (McStay, 2018; Liu et al., 2024). Consistent with this interpretation, Lai et al. (2025) found that loneliness not only predicts greater use of conversational AI for companionship but also mediates the association between depressive symptoms and emotionally oriented interactions with conversational agents.

A complementary perspective is provided by perceived social support, defined as individuals' beliefs regarding the availability of emotional, informational and practical support from significant others rather than the objective characteristics of their social network (Zimet et al., 1988). The Multidimensional Scale of Perceived Social Support distinguishes perceived support received from family, friends, and significant others, emphasizing the subjective accessibility of supportive relationships. From this perspective, lower perceived social support may increase the emotional value attributed to

interactions with conversational AI, not because these systems substitute interpersonal relationships, but because they provide an immediately accessible context for emotional expression, reflection, and perceived understanding. This interpretation is consistent with contemporary relational conceptualizations of machine companionship and attachment, according to which emotionally meaningful human–AI interactions arise through the convergence of users' relational needs and the communicative affordances of conversational systems (Banks, 2026; Yang & Oshio, 2025).

Despite the growing body of research on AI companionship, attachment processes, and the psychosocial implications of conversational AI, comparatively little is known about the individual psychological characteristics associated with emotional-relational engagement with these systems, particularly among university students. Existing studies have primarily focused on the technological capabilities of conversational agents or on their potential applications in mental health and emotional support, whereas fewer investigations have examined why some individuals are more likely than others to experience conversational AI as a psychologically meaningful interaction partner (Banks, 2026; Yang & Oshio, 2025; Lai et al., 2025).

Based on this literature, it was hypothesized that higher levels of psychological distress and perceived loneliness would be positively associated with emotional-relational engagement with conversational AI, whereas higher perceived social support would show a negative association. By identifying the psychological characteristics associated with emotionally meaningful interactions with conversational AI, this study aims to contribute to a better understanding of the individual factors underlying emerging forms of human–AI relationships and to inform future educational and psychological research on the role of conversational AI in young adults' emotional and relational lives.

3. Methods

3.1 Study Design

A quantitative, observational, cross-sectional, and correlational study was conducted to examine emotional-relational engagement with conversational AI and its associations with psychological distress, perceived social support, and loneliness in a sample of Italian university students.

3.2 Participants

The sample consisted of 138 Italian university students enrolled in the Bachelor's Degree Program in Educational Sciences at the University of Cassino and Southern Lazio. Participants were recruited through convenience sampling and voluntarily agreed to participate in the study. All participants provided informed consent prior to completing the questionnaire. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the applicable regulations concerning the protection of personal data.

3.3 Procedure

Data were collected through an anonymous online questionnaire administered via a dedicated digital platform. Before completing the survey, participants received an information sheet explaining the aims of the study, the procedures involved, the voluntary nature of participation, the confidentiality and anonymity of the collected data, and their right to withdraw from the study at any time without consequences. Access to the questionnaire was granted only after participants had provided informed consent. The survey included an initial section collecting socio-demographic information and data on conversational AI

use, followed by the psychometric instruments used to assess the study variables. Completion of the questionnaire required approximately 15–20 minutes.

3.4 Measures

The Depression Anxiety Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995) is the short version of the original DASS-42 and is a self-report instrument designed to assess the severity of symptoms of depression, anxiety, and stress in adults. The scale consists of 21 items divided into three subscales of seven items each: Depression, which assesses dysphoria, loss of interest, anhedonia, and low self-esteem; Anxiety, which measures physiological arousal, situational fear, and subjective anxiety; and Stress, which evaluates persistent tension, irritability, difficulty relaxing, and hyperarousal. Participants rate the extent to which each statement described their experiences over the previous week using a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). Scores for each subscale are obtained by summing the corresponding items, with higher scores indicating greater symptom severity. The validated Italian version of the DASS-21 was used in the present study, as it has demonstrated satisfactory validity and reliability across several Italian samples, confirming the original three-factor structure and adequate levels of internal consistency (Bottesi et al., 2015). For each subscale, the total score was calculated by summing the seven corresponding items and multiplying the result by two, following the authors' recommendations to obtain scores comparable to those of the original 42-item version and to allow the application of the corresponding interpretative cut-off scores.

Perceived social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988), in its validated Italian

version (Di Fabio & Palazzeschi, 2015). The instrument consists of 12 items measuring perceived social support from three different sources: family, friends, and significant others, each represented by four items. Responses are rated on a 7-point Likert scale ranging from 1 (Very strongly disagree) to 7 (Very strongly agree). The overall score is calculated as the mean of the 12 items, whereas the scores for the three subscales correspond to the mean of the respective four items. Higher scores indicate greater perceived social support.

The University of California Los Angeles Loneliness Scale – Version 3 (UCLA-LS3) is a self-report instrument developed by Daniel Russell to assess perceived loneliness, defined as the subjective discrepancy between desired and actual social relationships. Version 3 of the scale consists of 20 items, including 11 negatively worded items and 9 positively worded items (reverse scored), which assess feelings of social isolation, sense of belonging, and the quality of interpersonal relationships. Items are rated on a 4-point Likert scale ranging from 1 (Never) to 4 (Often). Total scores range from 20 to 80, with higher scores indicating greater perceived loneliness. The UCLA-LS3 has demonstrated excellent psychometric properties, including high internal consistency (α ranging from .89 to .94), good test–retest reliability ($r = .73$), and strong evidence of convergent and construct validity. For the present study, the Italian version of the UCLA-LS3 was used. This version was developed through a translation and back-translation procedure following the guidelines of the International Test Commission and was initially adapted by Fossati et al. (2003). Subsequent psychometric analyses confirmed the adequacy of the Italian version, demonstrating a stable factor structure and high reliability in samples of Italian adults and university students, thus supporting its use for the assessment of perceived loneliness.

Conversational AI Emotional-Relational Scale (CAERS).Per valutare la qualità della Research Project To assess the quality of the emotional relationship established with conversational artificial intelligence systems, the Conversational AI Emotional-Relational Scale (CAERS) was specifically developed for the present study. The instrument was designed to measure the extent to which users attribute an emotional support, personal expression, and relational function to interactions with conversational AI, distinguishing this type of engagement from a purely informational or functional use. The scale is preceded by two screening questions aimed at assessing participants' use of conversational AI systems during the previous three months and the frequency of such use. The main section consists of 25 items rated on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). Higher scores indicate a stronger emotional-relational orientation in the use of conversational AI.

Based on the proposed theoretical model, the items are organized into five dimensions, each comprising five items:

- Emotional Disclosure, assessing the tendency to share personal thoughts, emotions, and experiences with conversational AI;
- Perceived Emotional Support, measuring the extent to which conversational AI is perceived as a source of comfort, understanding, and emotional regulation;
- Psychological Safety / Non-judgment, assessing the perception of being able to interact with conversational AI in a psychologically safe and non-judgmental environment;
- Relational Attachment, exploring the affective involvement and sense of connection developed toward conversational AI;

- Relational Orientation of Use, assessing the tendency to use conversational AI not only for informational purposes but also to satisfy personal, relational, and companionship needs.

For each subscale, the mean score of the corresponding items was calculated, whereas the overall CAERS score was obtained by averaging all 25 items. All items are positively worded, and no reverse-scored items are included. Higher scores indicate a greater tendency to use conversational AI as an emotional and relational resource. As the CAERS is a newly developed instrument specifically designed for the present study, its psychometric properties, including factor structure, internal consistency, and construct validity, were examined through statistical analyses conducted on the study sample.

3.5 Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 31.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (means, standard deviations, frequencies, and percentages) were first computed to describe the characteristics of the sample and the levels of the main study variables. To examine the relationships between emotional-relational engagement with conversational AI and the psychological variables considered, Pearson's correlation analyses were conducted. Specifically, associations between the total score of the Conversational AI Emotional-Relational Scale (CAERS) and the scores for depression, anxiety, stress, perceived social support, and loneliness were examined. Correlations were also calculated between the five CAERS dimensions (Emotional Disclosure, Perceived Emotional Support, Psychological Safety/Non-judgment, Relational Attachment, and Relational Orientation of Use) and the other study variables in order to further explore the different aspects of emotional-relational engagement with conversational AI. To identify the predictors of emotional-relational engagement with

conversational AI, a multiple linear regression analysis was conducted using the total CAERS score as the dependent variable and the scores for depression, anxiety, stress, and perceived social support as independent variables. This analysis allowed the specific contribution of each predictor to be estimated while simultaneously controlling for the effects of the other variables included in the model.

Finally, descriptive analyses of the individual CAERS items were conducted to identify the relational characteristics most strongly attributed to interactions with conversational AI and to further explore how university students perceive AI as a space for self-expression, emotional support, and relational engagement.

For all analyses, statistical significance was set at $p < .05$.

4. Results

4.1 Sample Characteristics

The sample consisted of 138 Italian university students, the majority of whom were female. Specifically, 128 participants (92.8%) were women and 10 (7.2%) were men. Participants ranged in age from 18 to 62 years ($M = 22.44$, $SD = 6.25$).

All participants were enrolled in the Bachelor's Degree Program in Educational Sciences (L-19). Regarding year of study, 87 students (63.0%) were enrolled in the first year of the bachelor's program, 40 (29.0%) in the second year, 9 (6.5%) in the third year, and 2 participants (1.4%) in the first year of the master's program.

With regard to the use of conversational artificial intelligence, 135 participants (97.8%) reported having used at least one conversational AI system (e.g., ChatGPT, Gemini, Copilot, or similar systems) during the previous three months, whereas 3 students (2.2%) reported no use. The most frequently

reported pattern of use was several times per week, indicated by 67 participants (48.6%). Additionally, 28 students (20.3%) reported using conversational AI several times per month, 22 (15.9%) reported using it several times per day, 13 (9.4%) reported daily use, and 8 students (5.8%) indicated that they used conversational AI less than once a month.

Overall, these findings indicate that the use of conversational AI was nearly universal within the sample, with weekly use being the most common pattern and a substantial proportion of students reporting daily or multiple daily interactions with these systems.

4.2 DASS-21 Results

The DASS-21 analyses were conducted on 137 valid cases, as one participant had a missing response on one of the scale items. Mean scores indicated moderate levels of psychological distress across all three dimensions assessed. Specifically, the mean score was 15.27 (SD = 10.43) for the Depression subscale, 13.21 (SD = 9.94) for the Anxiety subscale, and 19.71 (SD = 9.67) for the Stress subscale (Table 1).

Among the three dimensions, Stress showed the highest mean score, whereas Anxiety presented the highest proportion of participants classified in the extremely severe category (28.5%). Based on the recommended DASS-21 cut-off scores, more than half of the sample reported at least moderate levels of depression (55.5%), anxiety (60.6%), and stress (52.6%), indicating a substantial presence of psychological distress in the study population.

Table 1: Means and standard deviations for the DASS-21 subscales

Subscale	N	Media (M)	Standard Deviation (SD)
Depressione	138	15,33	10,42
Ansia	137*	13,21	9,94
Stress	138	19,74	9,64

Table 2: Distribution of participants according to DASS-21 severity categories

Level	Depression	Anxiety	Stress
Normal	42 (30,7%)	45 (32,8%)	45 (32,8%)
Mild	19 (13,9%)	9 (6,6%)	20 (14,6%)
Moderate	34 (24,8%)	23 (16,8%)	29 (21,2%)
Severe	19 (13,9%)	21 (15,3%)	30 (21,9%)
Extremely severe	23 (16,8%)	39 (28,5%)	13 (9,5%)

3.3 Multidimensional Scale of Perceived Social Support (MSPSS) Results

The MSPSS scores indicated a high level of perceived social support (M = 5.57, SD = 1.20). All subscales yielded mean scores above the conventional cut-off commonly used to indicate high perceived social support (> 5). Specifically, the highest mean score was observed for the Significant Other subscale (M = 5.97, SD = 1.44), followed by the Family subscale (M = 5.56, SD = 1.55) and the Friends subscale (M = 5.19, SD = 1.58). Overall, these findings suggest that participants

perceived the availability of an adequate social support network, particularly from significant others and family members.

Table 3: Means and standard deviations for the MSPSS total score and subscales

Subscale	N	Media (M)	Standard Deviation (SD)
Significant Other	138	5,97	1,44
Family	138	5,56	1,55
Friends	138	5,19	1,58
Total Perceived Social Support	138	5,57	1,20

4.4 University of California Los Angeles Loneliness Scale – Version 3 (UCLA-LS3) Results

Participants obtained a mean UCLA-LS3 score of 39.13 (SD = 11.90), with observed scores ranging from 20 to 80, corresponding to the theoretical range of the scale. Overall, these findings suggest relatively low levels of perceived loneliness, indicating that most students generally perceived their social relationships as satisfactory and did not, on average, report marked feelings of social isolation or lack of belonging. The standard deviation (SD = 11.90), however, indicates considerable variability in participants' scores, suggesting that, alongside students reporting low levels of perceived loneliness, a proportion of participants experienced more pronounced feelings of social isolation and social disconnection (Table 4). This heterogeneity suggests that perceived loneliness represents a relevant construct for understanding individual differences within the sample and supports further examination of

its associations with the other psychological variables investigated. Overall, the findings describe a sample characterized by a generally positive perception of social relationships while also highlighting substantial individual differences in perceived loneliness.

Table 4: Descriptive statistics for the UCLA-LS3

Scale	*M*	*SD*	Min	Max	Theoretical Range
UCLA-LS3 (20 items)	39.13	11.90	20	80	20–80

4.5 Conversational AI Emotional-Relational Scale (CAERS) Results

Descriptive analyses of the Conversational AI Emotional-Relational Scale (CAERS) revealed an overall mean score of 1.99 (on a scale ranging from 1 to 5), indicating a generally low level of emotional-relational engagement with conversational AI. Overall, students showed a limited tendency to perceive conversational AI as a source of emotional support, companionship, or a substitute for interpersonal relationships.

However, the analysis of individual items revealed a more nuanced profile. The highest mean scores were observed for items describing conversational AI as a communicative context characterized by freedom of expression and absence of judgment. In particular, participants reported the highest level of agreement with the statement “I feel free to express myself when talking to AI” (M = 2.69), followed by “I feel less judged by AI than by other people” (M = 2.57) and “I can be myself when interacting with AI” (M = 2.50). Relatively higher scores were also observed for the items “Talking with AI is different from simply searching for information” (M = 2.30) and “AI makes me feel listened to” (M = 2.30),

suggesting that some students attribute characteristics to interactions with AI that extend beyond its purely informational function.

By contrast, items reflecting deeper forms of emotional engagement and relational attachment showed the lowest mean scores. Specifically, participants reported limited agreement with statements such as “I become emotionally attached to my conversations with AI” (M = 1.36), “I use AI to feel less lonely” (M = 1.45), “I feel an emotional connection with AI” (M = 1.47), and “AI can represent a form of companionship for me” (M = 1.70).

Overall, the findings suggest that university students generally do not perceive conversational AI as a substitute for human relationships, nor do they develop substantial forms of emotional attachment toward these systems. Rather, conversational AI appears to be perceived primarily as a communicative space characterized by openness, non-judgment, and opportunities for self-expression, features that may facilitate dialogue and personal reflection without necessarily leading to affective forms of relational engagement.

4.6 Correlational Analyses

4.6.1 Correlations Between Emotional-Relational Engagement with Conversational AI and Psychological Distress

Correlation analyses revealed positive and statistically significant associations between emotional-relational engagement with conversational AI and all dimensions of psychological distress measured by the DASS-21. Specifically, the total CAERS score was positively correlated with depression ($r = .274$, $p = .001$), anxiety ($r = .225$, $p = .008$), and stress ($r = .274$, $p = .001$). Although the magnitude of these correlations corresponds to small-to-moderate effect sizes, the findings indicate that higher levels of depressive, anxiety, and stress

symptoms are associated with greater emotional-relational engagement with conversational AI.

The analysis of the individual CAERS dimensions revealed a largely consistent pattern. All subscales showed positive and significant correlations with the three DASS-21 dimensions, suggesting that psychological distress is associated with different forms of engagement with conversational AI. The Emotional Disclosure dimension was positively correlated with depression ($r = .270$, $p = .001$), anxiety ($r = .186$, $p = .029$), and stress ($r = .249$, $p = .003$), indicating that students experiencing higher levels of psychological distress were more likely to share personal thoughts and emotions with conversational AI. Similarly, the Perceived Emotional Support dimension showed significant positive associations with depression ($r = .234$, $p = .006$), anxiety ($r = .197$, $p = .020$), and stress ($r = .224$, $p = .008$), suggesting that higher levels of psychological distress were associated with a greater tendency to perceive conversational AI as a source of emotional support. Comparable findings emerged for the Psychological Safety/Non-judgment dimension, which was positively correlated with depression ($r = .258$, $p = .002$), anxiety ($r = .189$, $p = .026$), and stress ($r = .265$, $p = .002$). These results indicate that students reporting higher levels of psychological distress were also more likely to perceive interactions with conversational AI as psychologically safe and free from judgment. The Relational Attachment dimension was positively associated with depression ($r = .216$, $p = .011$), anxiety ($r = .237$, $p = .005$), and stress ($r = .240$, $p = .005$), suggesting a greater tendency to develop affective involvement with conversational AI among participants reporting higher levels of psychological distress. Finally, the Relational Orientation of Use dimension was also significantly associated with depression ($r = .263$, $p = .002$), anxiety ($r = .235$, $p = .006$), and stress ($r = .270$, $p = .001$), indicating that students experiencing

greater psychological distress were more likely to use conversational AI not only for informational purposes but also to meet personal, emotional, and relational needs.

Overall, the observed correlations reveal a consistent pattern in which higher levels of psychological distress are systematically associated with greater emotional-relational engagement with conversational AI, although the strength of these associations remains relatively modest.

Table 5: Correlations between CAERS scores and DASS-21 scores

CAERS	**Depression**	**Anxiety**	**Stress**
CAERS Total Score	r = .274, p = .001	r = .225, p = .008	r = .274, p = .001
Emotional Disclosure	r = .270, p = .001	r = .186, p = .029	r = .249, p = .003
Perceived Emotional Support	r = .234, p = .006	r = .197, p = .020	r = .224, p = .008
Psychological Safety/Non-judgment	r = .258, p = .002	r = .189, p = .026	r = .265, p = .002
Relational Attachment	r = .216, p = .011	r = .237, p = .005	r = .240, p = .005
Relational Orientation of Use	r = .263, p = .002	r = .235, p = .006	r = .270, p = .001

4.6.2 Correlations Between Emotional-Relational Engagement with Conversational AI and Perceived Social Support

Correlation analyses revealed a predominantly negative association between emotional-relational engagement with conversational AI and perceived social

support. Overall, higher levels of perceived social support were associated with lower levels of emotional-relational engagement with conversational AI. Specifically, the total CAERS score showed negative and statistically significant correlations with perceived support from a Significant Other ($r = -.223$, $p = .009$), Family support ($r = -.178$, $p = .037$), and the total MSPSS score ($r = -.198$, $p = .020$). No significant association was found with perceived support from Friends ($r = -.074$, $p = .386$).

The analysis of the individual CAERS dimensions confirmed this pattern. The Emotional Disclosure dimension was negatively correlated with support from a Significant Other ($r = -.265$, $p = .002$) and with the total MSPSS score ($r = -.196$, $p = .021$), indicating that students who perceived lower levels of social support were more likely to share personal thoughts and emotions with conversational AI. The Psychological Safety/Non-judgment dimension showed negative correlations with support from a Significant Other ($r = -.211$, $p = .013$), Family support ($r = -.198$, $p = .020$), and the total MSPSS score ($r = -.220$, $p = .009$), suggesting that lower perceived social support was associated with a greater tendency to perceive conversational AI as a psychologically safe and non-judgmental communicative environment. Similarly, the Relational Attachment and Relational Orientation of Use dimensions were negatively associated with support from a Significant Other ($r = -.188$, $p = .027$; $r = -.191$, $p = .025$, respectively). In addition, the Relational Orientation of Use dimension was negatively correlated with Family support ($r = -.168$, $p = .049$) and the total MSPSS score ($r = -.193$, $p = .023$). No statistically significant correlations emerged between any CAERS dimension and perceived support from Friends.

Overall, the findings suggest that emotional-relational engagement with conversational AI tends to be greater among students who perceive lower levels of support from significant others and family members, whereas

perceived support from friends does not appear to be significantly associated with the ways in which students relate to conversational AI.

Table 6: Correlations between CAERS and MSPSS scores

CAERS	Significant Other	Family	Friends	Total MSPSS Score
CAERS Total Score	−.223 (.009)	−.178 (.037)	−.074 (.386)	−.198 (.020)
Emotional Disclosure	−.265 (.002)	−.142 (.097)	−.067 (.438)	−.196 (.021)
Perceived Emotional Support	−.149 (.080)	−.147 (.085)	−.010 (.906)	−.128 (.136)
Psychological Safety/Non-judgment	−.211 (.013)	−.198 (.020)	−.117 (.172)	−.220 (.009)
Relational Attachment	−.188 (.027)	−.157 (.066)	−.036 (.673)	−.158 (.065)
Relational Orientation of Use	−.191 (.025)	−.168 (.049)	−.101 (.239)	−.193 (.023)

4.6.2 Correlations Between Emotional-Relational Engagement with Conversational AI and Perceived Loneliness

Correlation analyses revealed a positive and statistically significant association between emotional-relational engagement with conversational AI and perceived loneliness. Specifically, the total CAERS score was positively

correlated with the total UCLA-LS3 score ($r = .198$, $p = .020$), indicating that higher levels of perceived loneliness were associated with greater emotional-relational engagement with conversational AI.

The analysis of the individual CAERS dimensions showed a largely consistent pattern. The Emotional Disclosure dimension exhibited the strongest correlation with perceived loneliness ($r = .215$, $p = .011$), suggesting that students experiencing higher levels of loneliness were more likely to share personal thoughts and emotions with conversational AI. The Psychological Safety/Non-judgment dimension was also positively associated with perceived loneliness ($r = .208$, $p = .014$), indicating that lonelier students were more likely to perceive interactions with conversational AI as psychologically safe and free from judgment. Positive, although relatively modest, correlations also emerged between perceived loneliness and the Relational Attachment ($r = .174$, $p = .041$) and Relational Orientation of Use ($r = .170$, $p = .047$) dimensions, suggesting that greater perceived social isolation was associated with a stronger tendency to attribute relational and personal functions to conversational AI. The only CAERS dimension that did not show a statistically significant association with perceived loneliness was Perceived Emotional Support ($r = .129$, $p = .132$).

Overall, the findings indicate that students reporting higher levels of perceived loneliness tend to exhibit greater emotional-relational engagement with conversational AI, particularly through increased emotional disclosure and a stronger perception of conversational AI as a psychologically safe and non-judgmental communicative environment.

Table 7: Correlations between CAERS and UCLA-LS3 scores

CAERS	Perceived Loneliness (UCLA-LS3)
CAERS Total Score	.198 (.020)
Emotional Disclosure	.215 (.011)
Perceived Emotional Support	.129 (.132)
Psychological Safety/Non-judgment	.208 (.014)
Relational Attachment	.174 (.041)
Relational Orientation of Use	.170 (.047)

4.6.4 Multiple Linear Regression Predicting Emotional-Relational Engagement with Conversational AI (CAERS)

To identify the predictors of emotional-relational engagement with conversational AI, a multiple linear regression analysis was conducted using the total score of the Conversational AI Emotional-Relational Scale (CAERS) as the dependent variable and depression, anxiety, stress, and perceived social support as predictor variables. The overall regression model was statistically significant ($F(4, 133) = 3.52$, $p = .009$) and explained 9.6% of the variance in emotional-relational engagement with conversational AI ($R^2 = .096$; adjusted $R^2 = .069$).

However, when all predictors were entered simultaneously into the model, none of the variables made a statistically significant independent contribution. Specifically, depression ($\beta = .117$, $p = .357$), anxiety ($\beta = .041$, $p = .737$), stress ($\beta = .126$, $p = .376$), and perceived social support ($\beta = -.102$, $p = .262$) were not significant predictors of the total CAERS score.

Overall, these findings suggest that although psychological distress and perceived social support were associated with emotional-relational engagement with conversational AI in the bivariate analyses, their effects diminished when the variables were considered simultaneously within the same regression model, indicating a likely overlap in the shared variance among the different predictors.

Table 8: Multiple linear regression predicting emotional-relational engagement with conversational AI (CAERS)

Predictor	**B**	**SE**	**β**	***t***	***p***
Depression	0.009	0.010	.117	0.924	.357
Anxiety	0.003	0.010	.041	0.337	.737
Stress	0.010	0.012	.126	0.888	.376
Total MSPSS Score	−0.068	0.060	−.102	−1.126	.262

5. **Discussion**

The present study explored the psychological correlates of emotional-relational engagement with conversational AI among Italian university students. Overall, participants reported generally low levels of emotional-relational engagement, suggesting that conversational AI was not commonly perceived as a substitute for interpersonal relationships or as an object of emotional attachment. However, descriptive analyses revealed a more nuanced pattern. The highest scores were observed for items describing conversational AI as a psychologically safe environment characterized by freedom of expression and reduced fear of judgment, whereas the lowest scores concerned

companionship, emotional attachment and the use of AI to alleviate loneliness. These findings suggest that, within this sample, the primary relational value attributed to conversational AI lies less in replacing human relationships than in providing a communicative space perceived as psychologically safe.

This interpretation is consistent with recent empirical evidence indicating that conversational AI facilitates self-disclosure by reducing perceived interpersonal risks rather than by fostering emotional dependence. A recent review by Papneja and Yadav (2025) identified perceived anonymity, continuous availability, and the absence of interpersonal judgment as key mechanisms underlying users' willingness to disclose personal experiences to conversational AI. Similarly, Croes et al. (2024) found that chatbot interactions were perceived as less judgmental than conversations with human interlocutors, while Kim et al. (2024) showed that perceived rapport and social presence enhance users' readiness to engage in self-disclosure. Together, these findings support the interpretation that conversational AI is primarily valued for the communicative conditions it creates rather than for its capacity to replace interpersonal relationships.

Our findings also refine current theoretical perspectives on human–AI relationships. While Banks (2026) conceptualizes machine companionship as an emergent relational experience and Yang and Oshio (2025) propose that conversational AI may partially fulfill attachment-related functions, our results suggest that, among university students, these functions are expressed primarily through psychological safety and openness rather than through genuine companionship or emotional attachment. From an educational perspective, conversational AI may therefore represent a psychologically safe space for reflection and emotional expression without necessarily replacing interpersonal relationships.

The correlational analyses revealed a coherent pattern across the psychological variables examined. Higher levels of depression, anxiety, stress, and perceived loneliness were associated with stronger emotional-relational engagement with conversational AI, whereas perceived social support showed predominantly negative associations. Although these correlations were generally small to moderate, they consistently suggest that conversational AI may acquire greater emotional significance among individuals experiencing higher psychological vulnerability and fewer perceived relational resources.

These findings are consistent with recent evidence indicating that emotionally meaningful interactions with conversational AI are shaped by users' psychological characteristics rather than by technological features alone (Fang et al., 2026). In particular, our results align with those of Lai et al. (2025), who found that loneliness mediated the relationship between depressive symptoms and the use of conversational AI for companionship, highlighting the role of subjective relational experiences in human–AI interactions. Similarly, the negative associations observed with perceived social support suggest that conversational AI may become more emotionally relevant when individuals perceive fewer supportive interpersonal resources, complementing Banks' (2026) view that machine companionship emerges through the interaction between users' relational needs and the communicative affordances of AI systems rather than as an intrinsic property of the technology itself.

Overall, these findings support the interpretation that emotional-relational engagement with conversational AI reflects a broader pattern of psychological vulnerability rather than a simple preference for digital interaction. Individuals experiencing greater emotional distress, loneliness, or lower perceived social support may be more likely to perceive conversational AI as a psychologically

meaningful resource, even in the absence of strong emotional attachment or companionship.

Among the psychological variables examined, perceived loneliness deserves particular attention. Unlike objective social isolation, loneliness reflects the subjective experience of insufficient or unsatisfactory social connectedness and has consistently been associated with the search for alternative sources of emotional connection (Hawkley & Cacioppo, 2010). In the present study, higher levels of loneliness were associated with greater emotional-relational engagement with conversational AI, particularly with emotional disclosure, psychological safety, and relational orientation. These findings are consistent with those of Lai et al. (2025), who identified loneliness as a key mechanism linking depressive symptoms to the use of conversational AI for companionship. Rather than suggesting that lonely individuals replace interpersonal relationships with AI, our results indicate that conversational AI may become particularly appealing because it provides an accessible, non-judgmental context for emotional expression when subjective relational needs are insufficiently met. However, because loneliness was not included in the multiple regression model, its potential independent contribution to emotional-relational engagement with conversational AI remains to be clarified in future research.

Although the overall regression model was statistically significant, none of the individual psychological variables independently predicted emotional-relational engagement with conversational AI when entered simultaneously into the model. This finding suggests that emotional-relational engagement is unlikely to be explained by a single psychological factor in isolation. Rather, it may emerge from the combined influence of multiple, partially overlapping dimensions of psychological functioning, including emotional distress and

perceived relational resources. A similar interpretation has been proposed by Fang et al. (2026), who emphasized that emotionally meaningful interactions with conversational AI are shaped by complex constellations of individual characteristics rather than by isolated psychological variables. Consequently, emotional-relational engagement with conversational AI may be better understood as a multidimensional phenomenon reflecting broader patterns of psychological vulnerability than as the direct consequence of any specific emotional condition.

Beyond their psychological implications, these findings also raise important educational considerations. The perception of conversational AI as a psychologically safe and non-judgmental space suggests that these systems may become integrated into students' reflective and self-directed learning processes, extending their role beyond information retrieval and academic assistance. Recent research in higher education has highlighted the potential of generative AI to support critical reflection, personalized learning, and feedback processes when its use is embedded within pedagogically guided activities rather than replacing independent thinking (Fuller & Barnes, 2024; Pentucci et al., 2024).

From this perspective, educational institutions should promote forms of AI literacy that encompass not only technical competencies but also emotional and relational awareness. Helping students critically recognize both the opportunities and the limitations of conversational AI may encourage its use as a complementary resource for reflection and self-regulation while preserving the central role of human relationships, dialogue, and educational guidance in learning and personal development.

Methodological limitations

The present study has several limitations that should be considered when interpreting the findings. First, the cross-sectional and correlational design does not allow conclusions to be drawn regarding the directionality or causal nature of the observed relationships between emotional-relational engagement with conversational AI, psychological distress, perceived social support, and loneliness. Longitudinal studies will therefore be necessary to examine how these associations evolve over time and to clarify the potential causal relationships among the variables investigated.

Second, the sample was recruited through convenience sampling and consisted predominantly of female university students enrolled in a single degree program. This characteristic limits the generalizability of the findings to other university populations and, more broadly, to different age groups and sociocultural contexts.

A further limitation concerns the exclusive use of self-report measures, which may be influenced by social desirability bias, recall bias, and individual differences in the interpretation of questionnaire items. Although this methodology represents the most appropriate strategy for investigating psychological constructs such as perceived loneliness, perceived social support, and emotional-relational engagement with conversational AI, future research could integrate behavioral measures, conversational AI usage data, or qualitative approaches to provide a more comprehensive understanding of the phenomenon.

Finally, the Conversational AI Emotional-Relational Scale (CAERS) is a newly developed instrument specifically developed for the present study. Although preliminary analyses demonstrated adequate levels of internal consistency, further validation studies involving larger and more heterogeneous samples

will be necessary to confirm its factor structure, temporal stability, and psychometric properties, thereby supporting its use in future research contexts.

6. Conclusions

The present study provides new evidence on the psychological correlates of emotional-relational engagement with conversational AI among university students. Overall, the findings indicate that conversational AI is not generally experienced as a substitute for interpersonal relationships or as an object of emotional attachment. Instead, participants primarily perceived these systems as psychologically safe and non-judgmental spaces that facilitate emotional expression and reflection.

Furthermore, emotional-relational engagement was associated with greater psychological vulnerability, particularly perceived loneliness, and with lower perceived social support, suggesting that the emotional significance attributed to conversational AI is shaped by users' psychological and relational experiences rather than by the technology itself. These findings contribute to the growing literature on human–AI relationships by highlighting the importance of adopting a relational perspective when examining conversational AI, while emphasizing the need for educational approaches that foster critical, reflective, and psychologically informed uses of these technologies.

Future research should extend these findings by examining more diverse populations, adopting longitudinal designs, and exploring how emotional-relational engagement with conversational AI evolves over time across different educational and developmental contexts.

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