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THE INDIRECT EFFECT OF ACTIVE PROCRASTINATION IN THE RELATIONSHIP BETWEEN CHATGPT USE IN ACADEMIC CONTEXTS AND CHATGPT-RELATED PSYCHOLOGICAL DISTRESS

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Abstract

The objectives of the current study were to investigate the potential indirect effect of active procrastination in the relationship between ChatGPT use in academic contexts and psychological distress related to ChatGPT use. The study included 236 student participants from Romania, of whom 68.2% were women, ranging in age from 18 to 25 years ($M = 20.64$; $SD = 1.97$). The participants completed instruments assessing ChatGPT use in academic contexts, active procrastination, psychological distress related to ChatGPT use, and various socio-demographic data. Our findings indicate that ChatGPT use in academic contexts is positively associated with psychological distress related to ChatGPT use, while active procrastination is negatively related to both ChatGPT use in academic contexts and psychological distress related to ChatGPT use. Moreover, active procrastination has an indirect effect on the aforementioned direct relationship. The theoretical and practical implications of the present findings are discussed.

Keywords: ChatGPT; ChatGPT use in academic contexts; psychological distress; active procrastination; Romania

Introduction

According to the American Psychological Association (APA), psychological distress is a collection of painful mental and physical symptoms that are linked with mood variations in the greater part of the population. However, it can signal the early stage of a variety of mental health illnesses (American Psychiatric Association, 2022). In the literature, psychological distress is defined as an emotional pain linked to needs and stress factors that are challenging to handle (Arvidsdotter et al., 2016). Psychological distress is currently significantly increasing among university students and the understanding of this phenomenon is becoming an important matter (Deasy et al., 2014; Drapeau et al., 2012; Kroeper et al., 2025; Naito et al., 2021), because psychological distress is strongly linked with other mental and physical problems such as poor sleep (Alfian et al., 2018; Alimoradi et al., 2021; Rezaei et al., 2023; Wang et al., 2021; Zhang et al., 2022), medical unexplained physical symptoms (Pallati et al., 2024), allergies (El Hennawi et al., 2016; Kerekes et al., 2021), higher risk for chronic obstructive pulmonary diseases, heart diseases, diabetes (Weissman, 2015), irritable bowel syndrome (Engel et al., 2021) or fatigue (Bouizzal et al., 2024).

Not only that the psychological distress is rising among university and college students (Knapstad et al., 2021), but their distress is significantly greater than the one registered in general population (Naylor, 2022). For instance, (Stallman, 2010) found that approximately 19% of university students reported clinically significant levels of psychological distress, compared to about 9% in the general population. In the literature, predictive factors for psychological distress in college students are discussed, such as

cigarette smoking, alcohol consumption, cannabis use, unhealthy diet or low levels of physical activity (Deasy et al., 2015; Sharp & Theiler, 2018). Furthermore, lack of social support (Siddiqui et al., 2019; Z. Wang et al., 2016), loneliness (McIntyre et al., 2018; Yung et al., 2023), financial stress (Alejandro et al., 2024; Cadaret & Bennett, 2019), adjustment to the University life difficulties (Warbah et al., 2007) all represent risk factors for psychological distress among college students. Among these, adaptation to university life can represent an important stressor, as it involves changes in social environment, scholar demands, autonomy, and lifestyle, which may exceed students' coping resources during the transitional period (Mastrokourou et al., 2024).

There are more factors, besides the ones previous discussed, that are correlated with psychological distress among university students, but less explored in the literature, such as ChatGPT use. This can occur because, in order to manage the pressures of university life, many students turn to various coping strategies, including the use of Artificial Intelligence (AI) tools (Kasneci et al., 2023). Through the use of AI search engines, students are now able to generate human-like answers to any academic inquiry using accessible resources (Daha & Altelwany, 2025). Due to the 'easier than ever access to information', the usage of ChatGPT or other AI chatbots has gained popularity among academia students, because it can be a useful tool in academic tasks. There are many ways in which AI helps students in their everyday academic tasks such as brainstorming support, content review and overall completing assignments (Uppal & Hajian, 2024), but also efficient learning methods and task management (Bouzar et al., 2024). The emergence of AI has improved so much these days that the educational environment has become harmonious for both teachers and students alike.

However, using AI for assignments, projects or even final thesis had raised psychological and ethical dilemmas (Teel et al., 2023), such as the impairment of critical thinking and personal or organizational reputation (Gerlich, 2025). Students who rely on AI tools often feel a low sense of achievement and a higher distress level (Budhathoki et al., 2024; Duong et al., 2025).

Using ChatGPT or other AI tools in academia raises integrity questions and challenges due to the possible plagiarism in academic assignments (Bin-Nashwan et al., 2023). With generative technology becoming more prevalent and accessible to the public, academic institutions have begun to regulate the use of AI-generated content to prevent plagiarism acts (McDonald et al., 2025; Smith et al., 2024; Wang et al., 2024).

In Romania, the debate around AI usage in academia is still developing. Being a recent topic, only a few Universities regulated this problem. For example, University of Bucharest's "Academic Integrity Code" warns against academic misconducts (e.g. the usage of AI tools) in assignments, projects or articles and the possible repercussions (such as written warnings, annulment of the submitted paper or temporary suspension) when submitting papers that are AI-assisted, the highest degree of punishment being the expulsion (Socaciu et al., 2022). Furthermore, Babeş-Bolyai University's", frowns upon the usage of generative AI in academic field, and any usage of these means is heavily sanctioned. However, since national legislation did not yet regulate the usage of AI tools in academia, universities generated their own rules, sometimes leading to uncertainty when it comes to using AI. Thus, this confusion can lead to distress when using ChatGPT, because of the fear of getting caught.

Although AI offers vast and powerful learning support, it can also generate significant emotional and ethical challenges in students. Acknowledging and addressing the distress is crucial, especially in Romania, where policies are still not yet developed.

Given the fact that, generally, students are more prone to experience psychological distress, compared to general population (19% vs 9%), it is important to explore the complexity of factors that can lead to this high rate.

Taking into consideration the current situation from Romania universities, respectively the risk of being expelled after using AI in academic workload, but also the lack of a national legislation, students can experience a higher level of psychological distress. This could happen because ChatGPT might be considered a cheating tool (Ortiz-Bonnin & Blahopoulou, 2025). Furthermore, the feeling of breaching the law in academia, along with considering themselves cheaters, morally wrong and impostors in academic contexts, all can lead to negative psychological outcomes.

Research in this field is extremely important to conduct, because, grounded in a deep understanding of this relationship, specialists can develop prevention and intervention programs in student mental health.

ChatGPT-related psychological distress

A qualitative exploratory study conducted by Selim et al. (2024) found that 23.5% of the participants felt anxiety when using AI, 35% of them dependence, 52% concerns about deskilling and 48% angst or pessimism about the future. These concerns stem from acknowledging their overreliance on AI (Zhai et al., 2024) and uncertainty regarding its evolving role in society (Mohamed et al., 2025). Likewise, some students reported a decline in their ability to perform tasks independently, citing reduced critical thinking and expressing symptoms of anxiety (Darwin et al., 2024). The use of ChatGPT in academic settings, where regulations concerning AI-generated content are in place, may have several psychological implications from the perspective of students (Baidoo-Anu et al., 2024). Anxiety towards the use of AI in the academic context is rooted in concerns such as the ethical violations of university regulations (Stone, 2023), the fear of being caught by AI detectors (Giray et al., 2025) or the lack of control over this newly emerging technology (Lund et al., 2024).

The engagement in any act that goes against the established norms of an education institution is referred to as academic dishonesty or academic misconduct (Sozon et al., 2025). The integration of AI-generated content into various tasks represents an aspect of academic dishonesty (Cotton et al., 2024; Eke, 2023; Niloy et al., 2024) which is significantly correlated with psychological distress (Błachnio et al., 2022; Sheppard & Hicks, 2017). When students engage in behaviors that do not adhere to the rules set by higher education institutions, they experience stress and anxiety due to the fear of being caught and penalized accordingly (Curtis, 2023).

To preserve the academic integrity, higher education institutions use platforms like Turnitin, Copyleaks, ZeroGPT or GPTZero to detect AI content in student submissions (Deep et al., 2025). However, such detection software tools are not sufficiently accurate, as they may produce erroneous statistical results by incorrectly identifying a text as AI-generated, failing to detect texts that are genuinely AI-generated and also showing an incorrect percentage of plagiarism (Ardito, 2025). There is a significant psychological burden when students' work is flagged or rated with a higher AI-generated content score than originally used, leading to feelings of guilt and even depression (Rafiq & Qurat-ul-Ain, 2025). The probabilistic and imperfect nature of AI detection tools becomes more problematic when it fails to distinguish between ethical use and abusive use of AI content in submissions (Giray, 2024). This can lead to harmful accusations of plagiarism and disciplinary measures (Dalalah & Dalalah, 2023; Giray et al., 2025).

Another important aspect regarding the problematic nature of ChatGPT or any other Artificial Intelligence-based software is that they also raises general privacy issues regarding data collection and storage (Al-Khassawneh, 2022; Curzon et al., 2021; Zhang et al., 2021).

ChatGPT processes the given inputs to generate responses, analyzes and gathers them for training purposes, potentially without users' knowledge or consent (Briganti, 2024). Hence, people have limited control over how their data is handled after the conversation with the chatbot ends (Zhu et al., 2022) which leads to heightened stress levels and increased anxiety. Students who are aware of the risks associated with ChatGPT usage and thus do not exhibit high levels of "Sociotechnical Blindness" tend to experience higher levels of concern and stress when they engage in using AI for academic tasks (Zhu et al., 2025).

ChatGPT use and active procrastination

ChatGPT is perceived as an aiding tool, but it can definitely have its flaws. Due to students' over-reliance on AI, they tend to postpone their work knowing that using ChatGPT will allow them to quickly solve any academic task in a matter of minutes (Gil et al., 2025), leading to the illusion of productivity. This means that students tend to believe that they're learning effectively through the use of AI, while in reality they may not actually retain the information (Swargiary, 2024), nor develop the necessary critical thinking skills needed for academic success (Melisa et al., 2025).

Additionally, when students have a task they can easily complete with ChatGPT, they will intentionally postpone them knowing that they can complete it faster and with minimal effort (Uppal & Hajian, 2024). One of the main possible factors is the lack of confidence in their own cognitive abilities. There is a significant correlation between students who score low at self-efficacy and the frequent use of AI, in order to overcome their negative perception over their academic skills (Rodríguez-Ruiz et al., 2025). Another reason can consist of tight schedules, where AI helps students improve their work in a timely manner (Afzal et al., 2025).

Procrastination is considered a frequent type of failure of the self-regulation process (Steel, 2007; Steel & Ferrari, 2013) and it is strongly associated with negative outcomes (Sirois, 2022; Sirois & Pychyl, 2013). This concept is also strongly correlated with fear of failure (Danne et al., 2024; Rahmaningtyas et al., 2022; Sudirman et al., 2023; Tan & Prihadi, 2022), depression, anxiety, stress (Cjuno et al., 2023; Jochmann et al., 2024; Kuftyak, 2022; Rozental et al., 2022) problematic smartphone use (Akinici, 2021; Li et al., 2020; Rozgonjuk et al., 2018; Yang et al., 2019) and low academic performance (Albulescu et al., 2024; Goroshit & Hen, 2021; Kuftyak, 2022). However, while passive procrastination is negatively associated with psychological well-being, studies show that people who active procrastinate tend to have higher psychological well-being scores (Habelrih & Hicks, 2015; Ismail, 2016).

Procrastination leads to the voluntary delay of planned activities, or as an inefficient lifestyle characterized by an inability to fulfill commitments and achieve goals (Steel & Ferrari, 2013). This delay is considered unjustified and unnecessary (Álvarez-Blas, 2010). Many researchers in the field of procrastination conceptualize it as a multidimensional trait, seeing not only its maladaptive (negative) forms, but also its adaptive (positive) ones (González-Brignardello & Sánchez-Elvira Paniagua, 2023; P. Sederlund et al., 2020; F. M. Sirois, 2023).

Choi and Moran (2009) distinguish between two primary types of procrastination: passive procrastinators and active procrastinators. Passive procrastinators are considered traditional procrastinators: those who delay tasks due to an inability to make decisions or act in a timely manner, which, according to the authors, often leads to negative outcomes such as depression and anxiety symptoms (Jochmann et al., 2024), academic issues (Kooren et al., 2024) and negative emotional effects: guilt, shame, sadness, frustration (Dardara & Al-Makhalid, 2022). In contrast, active procrastinators intentionally postpone tasks, demonstrating high levels of commitment and performance under time pressure, active

coping and lower levels of perceived stress; they meet deadlines and achieve satisfactory results (Choi & Moran, 2009). Active procrastination is a multidimensional construct characterized by four defining features: (1) a preference for time pressure – the challenge of working under last-minute deadlines enhances motivation rather than inducing stress; (2) an intentional decision to procrastinate – delaying tasks deliberately to increase motivation and efficiency; (3) the ability to meet deadlines – active procrastinators are able to adapt to time constraints and complete tasks despite the pressure; and (4) satisfaction with outcomes – effective time management and sustained motivation allow active procrastinators to achieve satisfactory results (Chun Chu & Choi, 2005). Additional findings indicate that active procrastination has a positive, albeit modest, effect on academic achievement (Kim & Seo, 2013) with the key predictor being the balance between challenge and skill. In contrast, academic procrastination is negatively associated with academic performance (Kim & Seo, 2015; Moon & Illingworth, 2005; Wesley, 1994), further highlighting the distinctiveness of active procrastination from other forms of procrastination.

In addition to the fact that active procrastinators delay their tasks intentionally, they also obtain positive results (Chun Chu & Choi, 2005). On the other hand, students who have a positive perception on ChatGPT tend to attain favorable academic outcomes such as more qualitative understanding of content, higher confidence in their knowledge and higher grades (Uppal & Hajian, 2024). An explanation for this phenomena could be the reduction of the necessary time for solving a task when assisted by AI tools (Paradis et al., 2024). Furthermore, because students can obtain information faster by using ChatGPT, their tendency of delaying tasks is increasing (Lahmer, 2025). Because the use of AI tools increase the probability of students to be delaying tasks intentionally, but also to have better academic performance, the current study aims to study the relationship between active procrastination and ChatGPT use in academic context.

A study identified a predictive relationship between procrastination and the variable Artificial Intelligence, in which the latter predicts procrastination in 96.6% (Belleza-Torrejón et al., 2023). A study conducted by Swargiary (2024) mainly focused on the effects of ChatGPT use in comparison with traditional study methods on a sample of 60 undergraduate students. At the end of the experiment, they concluded that the experimental group that used mainly ChatGPT experienced an increase of approximately 13% in procrastination levels as opposed to the control group who experienced a slight, but significant decrease.

Ethical considerations regarding the use of ChatGPT in the academic environment

Not only that ChatGPT usage is increasing in schools, but it is also becoming a controversial matter due to the ethical considerations, owing to the complexity of the assistance that this AI tool can provide for students (Farhi et al., 2023; Huallpa et al., 2023; Mukhtar et al., 2025).

The mediating role of active procrastination

Although AI use has been found to have a negative relationship with psychological distress (Bahari et al., 2025; Duong et al., 2025) some studies show that it can also have benefits on students' mental health (Gao, 2024; Sandu et al., 2024; Sayed et al., 2024). Furthermore, a study shown that, after using GenAI chatbots in order to prepare for exams, there were not noted any significant differences in anxiety text among university students. Moreover procrastination is associated with problematic electronic device and smartphone usage (Lee, 2025; Rozgonjuk et al., 2018; Tian et al., 2021) and the most important for the current study, the use of ChatGPT (Abbas et al., 2024; Daha & Altelwany, 2025; Gil et al., 2025; Uppal & Hajian, 2024). In addition, psychological distress has also been found to be linked to procrastination (Eisenbeck et al., 2019; Maria-Ioanna & Patra, 2022; Sirois, 2022).

Thus, we believe that procrastination may mediate the relationship between the two variables. To our knowledge, this study is the first study to examine the indirect effect of procrastination on the direct relationship between ChatGPT use and psychological distress.

The present study

Based on the previous literature, the present study aims to examine the significance of active procrastination on the direct relationship between ChatGPT use in academic contexts and psychological distress among college students.

The novelty of our research lies in exploring the relationship between ChatGPT use in academic context, active procrastination and psychological distress within an understudied contextual setting, that of Eastern Europe, with a focus on Romanian university students. Moreover, the novelty of our study lies in investigating the mediating role of the active procrastination in the association between ChatGPT use and psychological distress.

We have formulated the following hypotheses in order to achieve our goal for the current paper:

Hypotheses

H1 – There is a significant association between ChatGPT use in academic contexts, active procrastination and psychological distress.

H2 – There is an indirect effect of active procrastination on the relationship between ChatGPT use in academic contexts and psychological distress.

Based on this framework, in *Figure 1* is presented the proposed model.

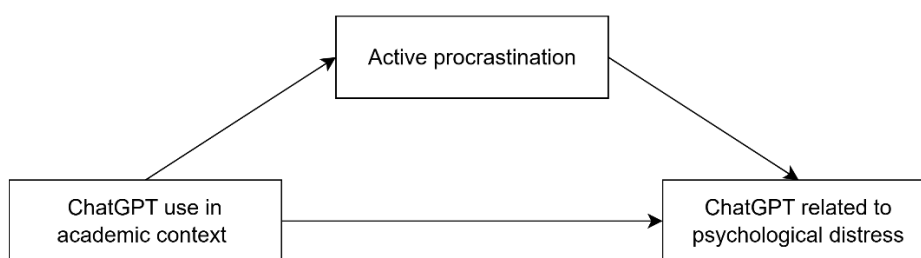


Figure 1. The proposed model

Method

Participants and procedure

The sample in this study consisted of 236 students, aged 18 to 25 ($M = 20.64$; $SD = 1.97$). Out of all participants, 161 were female (68.20%), 68 were male (28.80%) and 7 were non-binary (3.00%). Based on the place of origin, 162 (68.60%) came from an urban setting while 74 (31.40%) came from a rural setting. Regarding personal monthly income, 26.7% of participants reported earning less than €200. Additionally, 34.7% reported an income between €200 and €499, while 12.3% reported earnings between €500 and €999. Furthermore, 6.4% indicated a monthly income between €1,000 and €1,999, and 2.1% reported earning between €2,000 and €4,999. Finally, 17.8% preferred not to disclose their income. Regarding the studies, 200 (84.70%) of the respondents were currently pursuing a bachelor's degree, while 36 (15.30%) of the respondents were enrolled in postgraduate studies at the time of completing the instruments. At the end of the data collection period, a total of 280 participants completed the instruments. Of these, 44 participants were excluded due to not meeting the selection criteria or insufficient attention to the control questions. The characteristics of the participants can be observed in *Table 1*.

Table 1. Sample Characteristics.

		N	%
1. Sex	Male	68	28.8
	Female	161	68.2
	Non-binary	7	3
2. Level of education	Pre-university	30	12.7
	Post-university	36	15.3
	Undergraduate	170	72
3. Marital status	In a relationship (not married)	93	39.4
	Married	5	2.1
	Widowed (not in a relationship)	1	0.4
	Single	134	56.8
	Rather not to say	3	1.3
4. Place of origin	Urban area	162	68.6
	Rural area	74	31.4
5. Religion orientation	Orthodox	151	64
	Catholic	13	5.5
	Protestant	2	0.8
	Atheist	27	11.4
	Agnostic	27	11.4
	Muslim	1	0.4
	Hindu	1	0.4
	I do not want to say	10	4.2
	Other	4	1.7

Data were collected between February 11, 2025 and March 10, 2025, through an online survey administered with Google Forms, by using the snowballing technique and convenience sampling. We utilized social media platforms such as Facebook, Instagram, Reddit or Discord to share the link across various groups of student associations, as well as university, faculty or community groups from major cities of Romania. The recruitment message distributed along with the survey link indicated that the participation was voluntary, involving no form of compensation, and was conducted for academic purposes by authors affiliated with a university. The involvement in the study required participants to be at least 18 years old and to be enrolled in undergraduate or graduate studies at the time of completing the questionnaire battery. Prior to completing the set of questionnaires, all participants were presented the informed consent outlining information about data confidentiality, their right to withdraw from the study at any moment or the use of data strictly for scientific purposes. Furthermore, a confirmation item regarding participants' consent to take part in the research was included at the beginning of the survey. The average filling time was 20-25 minutes.

The study was approved by the Ethics Committee of the Faculty where all authors are affiliated (No. 388/10.02.2025).

The research was conducted in accordance with the American Psychological Association (APA) ethical standards in the treatment of human research individuals. Additionally, this work adheres to the provisions of the Declaration of Helsinki from 1995, revised at Edinburgh in 2000.

Measures

The tools were translated from English into Romanian using the Backward method. Recommendations for translation and adaptation of the scales were made according to protocol (Maneesriwongul & Dixon, 2004; Sousa & Rojjanasrirat, 2011).

ChatGPT use in academic contexts. To assess the usage of ChatGPT in academic contexts, we utilized the “ChatGPT Usage Scale” (Nemt-allah et al., 2024). This instrument consists of 15 items (e.g. “I use ChatGPT to generate ideas for my academic writing.”) rated on a 5-point Likert scale ranging from 1 (“*strongly disagree*”) to 5 (“*strongly agree*”). In the present study, the internal consistency was questionable ($\alpha=0.61$).

Active procrastination. We utilized the “New Scale of Active Procrastination” (Choi & Moran, 2009). This instrument consists of 16 items (e.g., “I often start things at the last minute and find it difficult to complete them on time”) rated on a 7-point Likert scale ranging from 1 (“*not at all true*”) to 7 (“*very true*”). Item scores are summed within each dimension to create subscale scores, and these are combined to yield an overall NSAP score. Higher scores indicate a stronger tendency toward active procrastination. In the present study, the internal consistency was acceptable ($\alpha=0.79$).

Psychological distress. To assess this construct, we employed the “Kessler Psychological Distress Scale” (Kessler et al., 2002). This instrument consists of 6 items (e.g. “During the last 30 days, about how often did you feel so depressed that nothing could cheer you up?”) measuring the severity of psychological distress among the general population over the past 30 days (depressed mood, motor agitation, fatigue, worthless guilt, anxiety). The instrument has demonstrated its psychometric properties in other studies involving the population of Romania (Huțul et al., 2025; Huțul & Karner-Huțuleac, 2024). Participants respond using a 5-point Likert scale from 0 (“*none of the time*”) to 4 (“*all of the time*”), with total scores ranging from 0 to 24. High scores indicate greater psychological distress. Each item was contextualized by indicating the participants to reflect on the symptoms of psychological distress related to the academic use of ChatGPT and other AI softwares, as can be observed in Appendix 1. Thus, we added underneath items the following indication: “Reflect on how frequently such feelings were triggered by your academic use of ChatGPT.”. In the present study, the internal consistency was excellent ($\alpha=0.90$).

Socio-demographic data. Participants were asked to report their age, sex, sexual orientation, place of origin, level of education, their monthly income, religious orientation, relationship status and relationship satisfaction.

Appendix 1. “Kessler Psychological Distress Scale” adapted to the academic use of ChatGPT

- | | |
|---|---|
| 1. During the last 30 days, how often did you feel so depressed nothing could cheer you up? | <i>Think about how often you have experienced such feelings as a result of using ChatGPT for academic purposes.</i> |
| 2. During the last 30 days, how often did you feel hopeless? | <i>Think about how often you have felt hopeless as a result of using ChatGPT for academic purposes.</i> |
| 3. During the last 30 days, how often did you feel restless or fidgety? | <i>Think about how often you have felt agitated as a result of using ChatGPT for academic purposes.</i> |
| 4. During the last 30 days, how often did you feel that everything was an effort? | <i>Think about how often you have felt that any daily task requires a lot of effort as a result of using ChatGPT for academic purposes.</i> |
| 5. During the last 30 days, how often did you feel worthless? | <i>Think about how often you have felt worthless as a result of using ChatGPT for academic purposes.</i> |
| 6. During the last 30 days, how often did you feel nervous? | <i>Think about how often you have felt nervous as a result of using ChatGPT for academic purposes.</i> |
-

Overview of the statistical analysis

Firstly, we conducted preliminary analysis, and then we tested the associations between the main variables, using Pearson Correlation. We used the PROCESS macro in SPSS 26 (George & Mallery, 2019) – Model 7 (Hayes, 2017) to examine the potential indirect effect of active procrastination on the relationship between academic use of ChatGPT and psychological distress.

Preliminary data analyses and the associations among the main variables

Before testing our research hypotheses, we examined the normality of data distribution using Skewness and Kurtosis values. All Skewness and Kurtosis values fall within the ± 2 range, as suggested by George and Mallery (2010). Descriptive statistics for the research variables are presented in *Table 2*.

Table 2. The correlations and the descriptive statistics of the analyzed study's variables

Variables	M	SD	Skewness (SE)	Kurtosis (SE)	1.	2.	3.
1. ChatGPT related psychological distress	10.38	6.38	.27 (.15)	-.90 (.21)	-		
2. Active Procrastination	48.80	9.88	.22 (.15)	-.24 (.31)	-	-	
3. ChatGPT use in academic contexts	49.96	13.46	-.62 (.15)	.25 (.31)	.13*	-	-
						.25**	
							.17**

The Pearson correlation analysis revealed that active procrastination was significantly and negatively associated with both academic use of ChatGPT and psychological distress. Moreover, academic use of ChatGPT was found to be significantly and positively associated with psychological distress.

Testing the indirect effect of active procrastination on the relationship between ChatGPT use in academic contexts and psychological distress

We have used the PROCESS macro in SPSS 26 – Model 4 (Hayes, 2017) to examine the indirect effect of active procrastination on the relationship between academic use of ChatGPT and psychological distress (see *Figure 2*).

The results suggest that the total effect of ChatGPT use in academic contexts on psychological distress is significant, $b = .06$; $SE = .03$; $p = .03$; 95% $CI [.005; .12]$. The direct effect is not significant, $b = .04$; $SE = .03$; $p = .12$; 95% $CI [-.01; .10]$. The indirect effect of active procrastination on the relationship between ChatGPT use in academic contexts and psychological distress is significant, $b = .01$; $SE = .009$; 95% $CI [.003; .04]$.

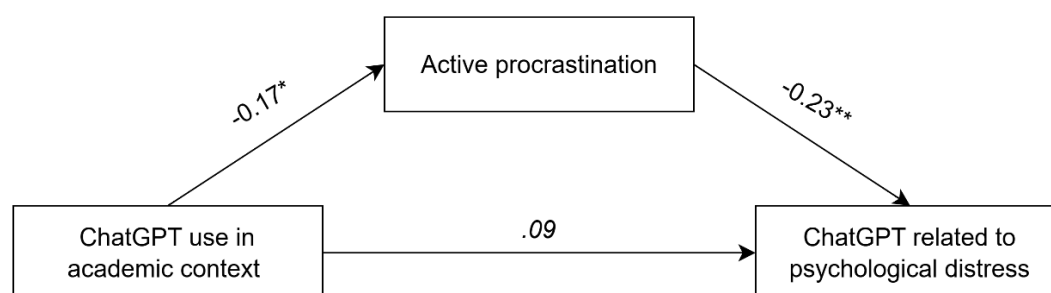


Figure 2. The indirect effect of active procrastination on the relationship between ChatGPT use in academic contexts and psychological distress

Discussions

The purpose of the present study was to test the relationships between the use of ChatGPT in academic contexts, active procrastination and psychological distress. Also, this study aimed to test whether active procrastination has an indirect effect on the main relationship between the use of ChatGPT in academic contexts and psychological distress.

In the present work, we investigated the relationship between ChatGPT use among students and psychological distress, which turned out to be statistically insignificant. This result is not supported by the existing literature, as excessive ChatGPT use is significantly related to symptoms of stress, anxiety and depression among students (Duong et al., 2024; Shahzad et al., 2025). However, the mediation analysis of our study revealed that active procrastination significantly mediated the relationship. In other words, ChatGPT use may not directly relate to psychological distress, its association with high active procrastination could indirectly relate to lower levels of stress, anxiety, and depression.

Firstly, our study revealed a significant and negative association between the ChatGPT use in academic contexts and active procrastination. Most of the existing literature conceptualizes procrastination as a general, predominantly maladaptive construct, without distinguishing between its active and passive forms identified by Choi and Moran (2009). Empirical research on its relationship with using Artificial Intelligence tools such as ChatGPT or Google NotebookLM in the academic contexts reflects the general conceptualization of procrastination and few or no studies have investigated the potential differences between the active and the passive types in relation to Artificial Intelligence use. A large number of studies have reported that the use of ChatGPT among students is significantly and positively associated with procrastination (Mokhtaria, 2025; Swargiary, 2024). Constant use of ChatGPT for generating ideas, paraphrasing concepts or receiving feedback and suggestions is associated with overreliance on AI (Zhai et al., 2024), reduced students' engagement in planning (Toma & Yáñez-Pérez, 2024), low self-regulation and increased procrastination. However, in contrast to the existing body of literature, we measured procrastination using the New Scale of Active Procrastination (NSAP) (Choi & Moran, 2009) and tested its correlation with ChatGPT use in academic contexts. Our result was unexpected, given that ChatGPT is facilitating procrastination. Yet, this finding points out a different pattern of association, due to the methodological choice of using a certain type of procrastination. Previous evidence indicates that reductions in procrastination are typically observed only when LLMs are embedded in guided learning apps and channel their use toward educational purposes (Hu et al., 2025; Ma & Chen, 2024). A possible explanation for our findings is that the use of Artificial Intelligence tools might reduce the perceived benefits associated with intentionally delaying tasks. ChatGPT reduces the effort required to complete academic tasks by providing students with immediate responses (AlAfnan et al., 2023), thereby the strategy of working effectively under pressure becomes less necessary.

Secondly, the present study has revealed a significant and negative association between Active Procrastination and Psychological distress. Procrastination, conceptualized as a general construct, is found to be positively correlated with psychological distress in specialized literature (Beutel et al., 2016; Maria-Ioanna & Patra, 2022; Rozental et al., 2018). Students who procrastinate find a temporary relief in delaying their tasks, thus experiencing reduced stress, but on long term, the habit of procrastinating has negative consequences on their stress and anxiety levels (Johansson et al., 2023; Saplavaska & Jerkunkova, 2018; Tice & Baumeister, 1997). However, unlike people who experience difficulties in self-regulating and tackling problems like passive procrastinators, people who deliberately postpone their activities and finish them in time do not report high levels of stress or anxiety, but rather high psychological well-being (Chun Chu & Choi, 2005; Habelrih & Hicks, 2015). Thus, active

procrastinators can function as efficiently and adaptive as non-procrastinators, as well as individuals who engage in systematically sustained work to meet deadlines. One possible explanation for the lower psychological distress reported by active procrastinators is their high levels of perceived control, purposeful use of time, and self-efficacy (Arias-Chávez et al., 2020; Chun Chu & Choi, 2005; da Silva et al., 2020). Perceived control refers to the conviction that an individual is able to regulate their own thoughts, feelings and actions, affect conditions in their surroundings and play an active role in achieving preferred results (Wallston et al., 1987) and it is significantly and negatively correlated with psychological distress among students (Craig et al., 2025). Also, a large number of studies show that academic self-efficacy and psychological distress negatively correlate as students who believe they can manage academic challenges appraise activities as less threatening and more controllable (Carranza et al., 2022; Kristensen et al., 2023). Therefore, our results are in line with already existing ones in specialized literature, regarding active procrastination.

Limitations and future directions

Despite the important contribution that the present study brings to the field, there are a series of limitations that need to be addressed. Firstly, the gender ratio in our study is not balanced. As a result of the imbalanced gender proportions, it is not possible to make relevant comparison, and we believe that future studies should try to achieve a more equitable distribution of the participant's gender. Secondly, another limitation of our study is represented by the self-reported instruments that have been used to measure the variables, which involve a high degree of subjectivity and a high risk of biases. Thirdly, the result may not be generalized due to the small sample of 236 participants, all students from Romania's universities. Thus, to avoid this issue in other studies, we strongly recommend future research to benefit a larger sample of participants. Fourthly, in the current paper some measures had questionable internal consistency ($\alpha=0.61$; *ChatGPT Usage Scale*). Furthermore, another limitation that must be addressed is the cross-sectional design of our study. To achieve a better understanding of the impact of ChatGPT usage in academic contexts and to analyze the long-term effects of AI usage in students, other studies could benefit of longitudinal research design.

Theoretical and practical implications

Regarding the theoretical implications of the current study, we confirmed the role of procrastination as a mediator, indirectly influencing the main relationship between Chat GPT usage in Academia and Psychological Distress. In addition, the results obtained align with theoretical models on self-regulation and the use of technology in an adaptive way, especially in students. Also, the results obtained contribute to the expansion of the literature on the use of Artificial Intelligence in the field of higher education, by supporting the instrumental benefits of AI (support in academic tasks, brainstorming or ideas regarding formatting and contents) that can significantly reduce the tendency to postpone projects or homework, ultimately reducing distress. Last but not least, another theoretical contribution that our study brings is related to the opinions according to which technology causes psychological distress, contradicting the nihilistic view of experts. The results of the current study support that the rational use of Artificial Intelligence has indirect positive effects on mental health.

As for the practical implications of the study, we are primarily talking about the instrumental utility of Chat GPT in reducing procrastination in academic tasks: AI having "all the answers", thus, the brainstorming stage can be facilitated by it. Also, the present study can form the basis of educational programs and psychological interventions that promote the use of Chat GPT to reduce procrastination and its negative psychological effects (e.g. psychological distress). In addition, the results obtained can contribute to the development of

academic policies, based on guidelines for the rational use of Artificial Intelligence and the pitfalls that may arise in the use of information generated by AI without being passed through the critical filter. Another practical implication of the results is reflected in the more efficient management of students' time but being the fact that the use of AI can reduce the level of procrastination. Finally, preventing academic stress is an outcome worth discussing, as students suffering from anxiety and depression may benefit from AI support, not as a substitute for effort, but as a facilitator in reducing procrastination in completing tasks and self-regulation.

Ethical implications

We propose several ethical recommendations for the responsible use of ChatGPT within academic settings. First, to enhance clarity regarding acceptable practices when students engage with AI-based tools, universities should develop explicit institutional policies governing the use of ChatGPT and related technologies in educational contexts. Such policies would provide a stable framework for both students and faculty members, reducing ambiguity and offering clear procedural guidance. Establishing transparent rules may also alleviate students' stress by helping them better understand and avoid prohibited forms of AI use. In addition, institutional guidelines should explicitly address responsible-use practices, including the avoidance of entering personally identifiable information into AI systems.

Second, we recommend that ChatGPT be used primarily as a tool for improving linguistic clarity and vocabulary rather than for generating full-length or complex academic assignments. Employing the tool for language enhancement rather than full content creation may reduce students' negative emotions associated with academic performance, as the AI serves as a supportive resource rather than as a surrogate for completing their work. To further prevent the dissemination of inaccurate or fabricated information, all content generated by ChatGPT should be independently verified through credible scholarly sources, such as Google Scholar.

Finally, promoting transparency is essential to maintaining academic integrity. Therefore, whenever ChatGPT is used in the preparation of academic work, students should explicitly disclose the nature and extent of its use. Such disclosure supports fairness, fosters trust within academic communities, and aligns with ethical standards in psychological research and education.

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The data supporting the findings of this research are available from the corresponding author upon request.

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