

The Effects of Video Games on Stress Reduction in University Students: A Systematic Review

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Abstract: University can be stressful for students affecting mental health, academics, and well-being. Common stressors include workload, relationships, and finances. Video games are a method of coping. Twelve studies met inclusion criteria found in a search of six databases. Studies involving: participants with comorbidities, the negative effects of video games, publishing before 2010, and only assessments of the frequency/duration of playtime were excluded. The quality was assessed using a self-developed quality appraisal. Video games may reduce stress in students, although the effect is not conclusive. Video games can provide a sense of control and mastery leading to increased relaxation and reduced stress levels. They can be a distraction from stressors and improve mood. Gaming helps reduce stress in students but more research is needed to fully understand the effects. Most studies did not look at the effects of playing video games in isolation. Individual differences may impact the effectiveness of stress management. Using varying strategies to cope including professional help is important. Further research should identify the most effective types of video games and develop best practices for stress management. Understanding potential benefits and limitations of video gaming can inform effective stress reduction strategies.

Key Words: Mental health, stress, video games, gaming, coping strategies

Résumé: L'université peut être une source de stress pour les étudiants, ce qui affecte leur santé mentale, leurs études et leur bien-être. Les facteurs de stress les plus courants sont la charge de travail, les relations et les finances. Les jeux vidéo sont un moyen d'y faire face. Douze études répondant aux critères d'inclusion ont été trouvées lors d'une recherche dans six bases de données. Ont été exclues les études portant sur des participants présentant des comorbidités, sur les effets négatifs des jeux vidéo, sur des publications antérieures à 2010 et sur l'évaluation de la fréquence et de la durée du temps de jeu. La qualité a été évaluée à l'aide d'une évaluation de

la qualité élaborée par l'auteur. Les jeux vidéo peuvent réduire le stress chez les étudiants, bien que l'effet ne soit pas concluant. Les jeux vidéo peuvent donner un sentiment de contrôle et de maîtrise, entraînant une relaxation accrue et une réduction des niveaux de stress. Ils peuvent détourner l'attention des facteurs de stress et améliorer l'humeur. Les jeux vidéo contribuent à réduire le stress chez les étudiants, mais des recherches supplémentaires sont nécessaires pour en comprendre pleinement les effets. La plupart des études n'ont pas examiné les effets des jeux vidéo de manière isolée. Les différences individuelles peuvent avoir un impact sur l'efficacité de la gestion du stress. Il est important d'utiliser différentes stratégies pour faire face au stress, y compris une aide professionnelle. Des recherches supplémentaires devraient permettre d'identifier les types de jeux vidéo les plus efficaces et de développer les meilleures pratiques de gestion du stress. La compréhension des avantages et des limites potentiels des jeux vidéo peut contribuer à l'élaboration de stratégies efficaces de réduction du stress.

Mots-clés:

Santé mentale, stress, jeux vidéo, jeux, stratégies d'adaptation

Introduction

University is often characterized by stress having impact on students' mental health, academic performance, and overall well-being. Stress is a major issue among university students (Hamaideh, 2011; Peltzer & Pengpid, 2017), and stressors include academics, relationships, and finances (Stallman, 2010). Excessive stress causes burnout, anxiety, and depression with consequences for student health and performance (Dyrbye et al., 2014; Liu et al., 2019).

Coping mechanisms include exercise, meditation, and therapy but gaming is an increasingly popular method of stress relief and entertainment among university students.

While some literature suggests video games can reduce stress (Granic et al., 2014; Kowert & Oldmeadow, 2015), the evidence is mixed. Given the high prevalence of stress among university students and the potential benefits of video games for stress reduction, it is important to examine the existing literature on the effects of video games on stress in students.

Understanding stress reduction potential of gaming can inform mental health services, educators, and policymakers in creating stress management strategies. Additionally, knowing most effective genres and optimal frequency allows for more targeted use of video games.

The purpose of this systematic review is to provide a comprehensive analysis of the existing literature on the effects of video games on stress reduction in university students.

The Role of Video Games in Stress Reduction

Playing video games can provide escapism from stress of daily life allowing students to a world where they have control and accomplish tasks. This sense of control and accomplishment can lead to reduced stress levels. Moreover, video games distract from stress which can help students to cope. When fully immersed playing video games, students can forget about their stressors for a while. This can lead to improved mood and re-energizing to deal with the stressors.

Research Question

Are video games an effective form of escapism used as a reduction mechanism for stress levels within undergraduate university students?

Methodology

Search Strategy

A comprehensive search of six databases (Wiley, Web of Science, Taylor and Francis, ScienceDirect, Sage, PubMed, and Google Scholar) was conducted. The entered search was:

[(All:"video games")OR(All:"gaming")OR(All:

"electronic games")][AND[All:stress reduction]AND[(All:undergraduate)AND(All:students)OR(All:university)AND(All:students)]AND[(All:"coping mechanism")OR(All:"stress management")]]AND NOT[(All:violence)ANDNOT(All:violent)ANDNOT(All:addiction)]AND[(All:"mental health")OR(All:"psychological well-being")]

Inclusion criteria were studies:

- Published in English
- Published after 2010
- On university students
- Using validated measures of stress.
- Conducted in online or in-person settings.
- Examining any video game genres, platforms, or types of play (e.g., single-player, multiplayer, competitive, casual).
- Using RCTs, quasi-experimental, or observational designs.

While the exclusion criteria were studies:

- Involving participants with existing comorbidities such as mental health disorders.
- Focusing on the negative effects of video games (e.g., violence, addiction)
- Published before 2010.
- Assessing frequency/duration of gameplay without examining relationship to stress reduction.

The selection was carried out by the author and bias was accounted for using objective, consistent inclusion/exclusion criteria and study quality appraisal tool.

Study Quality Appraisal Strategy

The studies chosen were assessed for quality according to the following self-developed quality appraisal tool:

1. Was the study design appropriate for the research question? (e.g., randomized controlled trial, quasi-experimental, observational, etc.)
2. Were the study participants clearly defined and representative of the target population?
3. Were the inclusion and exclusion criteria clearly defined and applied consistently?
4. Was the intervention or exposure of interest clearly defined and consistently applied to all participants?
5. Were the outcome measures clearly defined and relevant?
6. Were the outcome measures valid and reliable? (e.g., validated self-report questionnaires, physiological measures, etc.)
7. Were the outcome assessors blinded to the intervention or exposure?
8. Was the sample size appropriate for the research question and statistical power?
9. Was there a comparison group or control condition?
10. Was the statistical analysis appropriate for the research question and study design?
11. Were study results or conclusions free of influence by funders?
12. No potential conflicts of interest reported by authors?

Each criterion is scored as "yes" (1 point), "no" (0 points), or "unclear" (0 points). The total score for each study ranges from 0 to 12 points with a higher score indicating better methodological quality. Studies with scores of 8 or above are considered of high quality.

Data Extraction

Relevant data to the research question, inclusion/exclusion criteria and stress levels measures were identified and a standardized data extraction form was used capturing: Title, Authors, Journal, Year of Publication, Study design, Sample size, Participant characteristics, Intervention/exposure, Genre of video game, Duration of video game exposure, Outcome measures, Tools to measure stress, Main findings, and Quality appraisal score.

Data Synthesis

Firstly, the main study characteristics (study design, sample size, and video game genre) and outcome measures (self-report questionnaires, physiological or behavioral measures) were summarized. Then, the main findings and any patterns/inconsistencies (differences in effectiveness or variations in effect magnitude) were identified. Finally, conclusions about overall effectiveness of stress reduction in undergraduate students were drawn while assessing study quality and implications.

Results

The twelve studies included reported a small stress reducing effect of gaming among university students, but some were of lower quality. Overall, the studies reporting stress reduction explained that games provide a sense of control and mastery leading to increased relaxation and reduced stress levels while others described that gaming distracts from stressors and improves mood.

See Figure 1 (Appendix) and Table 1.

Discussion

This review provided a comprehensive analysis of literature on the effects of gaming on stress in students with the evidence of stress reduction by gaming in university students being present and positive (Amos, Bedu-Addo, & Antwi, 2020; Atler, Eakman, & Orsi, 2018; Atler & Sharp, 2019; Essemiah et al., 2023; Johannes, Vuorre, & Przybylski, 2021; Laniton, Vallar, & Cuarteros, 2022; Marquet, Alberico, & Hipp, 2018; Marallag et al., 2023; Mozellius, 2014; Nordby, Løkken, & Pfuhl, 2019; Reis et al., 2021; Tag et al., 2022; Staser, 2021; Strom et al., 2021). While all studies suggest that playing video games can have some positive effect on stress reduction, the studies in totality did not provide conclusive evidence.

The studies reported that playing video games can provide a sense of control and mastery leading to increased relaxation and reduced stress (Nordby, Løkken, & Pfuhl, 2019; Marallag et al., 2023). Additionally, some studies found that gaming provides distraction from stressors and improves mood (Amos, Bedu-Addo, & Antwi, 2020; Johannes, Vuorre, & Przybylski, 2021; Staser, 2021). This is consistent with the notion of temporary escape from daily stress and escapism, allowing individuals to enter into a world where they have control and can accomplish tasks (Essemiah et al., 2023; Staser, 2021).

However, the quality of studies varied and more research is needed to fully understand the effects of video games on stress reduction in university students. Additionally, studies used different measures of stress and gaming making it difficult to compare results. Furthermore, the studies were conducted in a variety of settings and with different populations, which may impact the generalizability. In addition, most studies did not look at the

effects of playing video games in isolation rather with a host of stress reduction methods including music, reading, sleeping, etc. (Atler, Eakman, & Orsi, 2018; Laniton, Vallar, & Cuarteros, 2022; Marallag et al., 2023; Reis et al., 2021; Tag et al., 2022). Finally, it is important to consider gender differences in coping with stress and escapism that was highlighted by one of the studies (Strom et al., 2021). It showed that while playing video games seems to be the top method to reduce stress/cope for males, females chose sleeping as the top method of coping with stress which suggests that playing video games is not a universal solution and threatens generalizability (Strom et al., 2021).

Despite these limitations, the findings of this review have implications for university students to cope with stress. While playing video games may not be a panacea for stress reduction, it can be a helpful for some individuals. However, individuals to be mindful of their video game use and ensure no interference with other aspects of their life happens. Additionally, more research needs to identify the types of video games most effective for stress reduction and the optimal duration and frequency of gameplay.

It is also important to note that the effects of video games on stress reduction may depend on individual differences, such as personality traits, sex, and gaming preferences (Strom et al., 2021). Future research should explore these individual

differences and their impact on the effectiveness of stress management. Moreover, while gaming provides a temporary escape from stress, they should not replace other stress management strategies, such as exercise and therapy, which have been shown to be not only restorative activities but also productive (Atler & Sharp, 2019; Marquet, Alberico, & Hipp, 2018). It is important to use a variety of strategies to manage stress and to seek professional help when necessary.

Finally, noting that video games also have negative effects on individuals' mental health, such as addiction/aggression, it is important to be mindful of the risks associated with video game use and to use in moderation.

Conclusion

In conclusion, understanding potential benefits and limitations of video games for stress management can inform university mental health services, educators, and policymakers in creating effective stress reduction strategies. While video games can be a helpful tool for university students to manage their stress, it may not be helpful for some. It is important for students to be mindful of their gaming time and ensure it is not interfering with other aspects of life. Further research needs to identify types of video games that are most effective for stress reduction and develop best practices for video game use for stress management.

Table 1. Main Characteristics of Included Studies highlighting methods, results and conclusions of each as well as the Quality Appraisal Results of each studying according to the quality appraisal tool described for the Effects of Video Games on Stress Reduction in University Students.

Study Title	Characteristics	Critical Appraisal Results
Experiences of online counseling among undergraduates in some Ghanaian universities.	<p>Methods: This qualitative study examined the experiences of eight student-teachers in Ghana who underwent online counseling. Results were gathered through a 5-question interview guide.</p> <p>Results: Poor internet connectivity affected online counseling. Student-clients found online counseling convenient and beneficial but faced obstacles. Non-verbal communication, drama, and computer games for mental health were discussed.</p> <p>Conclusion: Online counseling has the potential to reach a larger population and save time. Computer games can motivate and challenge young people to reach their goals and manage stress.</p>	Y Y N Y Y Y N N U Y Y Y Score: 8/12
Reported restorative experiences associated with everyday activities among university students	<p>Methods: The study examined activities reported, entry errors, and missing time. Initial variables included time spent and average ratings of 20 activity types. The study was cross-sectional and couldn't establish causal relationships. Data from 264 participants was analyzed.</p> <p>Results: University students reported negative impacts of demands on sleep, both inside and outside of school. Sleeping was found to be the most restorative activity on average, while working for wages was the least. Restoration from sleeping was similar to reading, hobbies, relaxing, eating, exercising, spending time with others, cooking, and playing virtual games.</p> <p>Conclusion: The study aimed to understand how occupation impacts university students. Demands in and outside of school negatively affect sleep damaging mental health. Restorative activities restore energy and attentional resources positively impacting mental health.</p>	Y Y Y Y Y N U Y Y Y Y Score: 10/12
College students' experiences of hedonia and eudaimonia in their everyday activities.	<p>Methods: To explore the relationship between pleasure and productivity in the daily activities of college students, this study sought to gain insights through a web-based survey. The survey was conducted among 264 undergraduate students, who were primarily of Caucasian ethnicity.</p>	Y Y Y Y Y Y N

	<p>Results: The findings of the survey were quite interesting. The study discovered that certain activities, such as hobbies, exercise, reading, caregiving, and cooking, not only promote personal well-being but also enhance productivity levels. On the other hand, activities such as rest/relaxation, music/movies, and virtual games were found to provide high levels of pleasure but low levels of productivity.</p> <p>Conclusion: This study emphasizes the need to manage stress and restructure daily activities for success among college students. Occupational analysis provides insights on how the environment affects productivity. With this knowledge, students can make informed decisions to structure their activities for both pleasure and productivity.</p>	Y Y Y Y Y Score: 11/12
How are students coping one year after the COVID-19 lockdown? A photoelicitation project.	<p>Methods: The study used a mixed-methods approach to investigate the coping strategies of 73 college students during the COVID-19 pandemic. Data was collected through both self-directed photos and surveys.</p> <p>Results: The study found that students used a variety of coping strategies, including going out, companion animals, humor, gaming, reframing, and venting. Video games, computer games, TV, and reading were described as modes of escapism.</p> <p>Conclusion: Self-directed photosurveys may provide a unique view of students' experiences and needs, which can enrich current survey-based methods for assessing campus climates. However, the study acknowledges the limitations of visual research methods and the low response rate for these surveys, which precludes generalization of the findings.</p>	Y Y Y Y N U N N U N Y Y Score: 6/12
Video game play is positively correlated with well-being.	<p>Methods: Objective data and survey responses were analyzed to study the player base of two popular games, Plants vs. Zombies: Battle for Neighborville and Animal Crossing: New Horizons. The survey measured well-being, self-reported play, and motivations. The sample size was 6529 participants.</p> <p>Results: The study found a positive association between game play and well-being, especially for frequent players. Players who valued autonomy, relatedness, and competence had higher well-being scores.</p> <p>Conclusion: This study shows the ethical collaboration between researchers and industry partners. Policymakers need reliable evidence on the impact of video games on mental health. Researchers should</p>	Y Y N Y Y Y N N 1 1 U Y Score: 8/12

	follow best practices like preregistering their research and using secondary data sources. Video game companies should share more game play data to test the effect of video games on mental health.	
University Students' viewpoints: A coping mechanism amid the COVID-19 pandemic.	<p>Methods: This study explored university students' coping mechanisms during the COVID-19 pandemic. The researchers identified the coping mechanisms used by the students and analyzed them using a quantitative research design. The study was conducted at one university in the Philippines, and 258 participants were considered in the analysis of the data.</p> <p>Results: The results showed that positive approaches like self-distraction, active coping, positive reframing, planning, acceptance, and religion were among the coping mechanisms used by the respondents.</p> <p>Conclusion: The study concluded that coping mechanisms are crucial in dealing with the COVID-19 pandemic, and individual environment and upbringing also play a crucial role in coping.</p>	Y Y U Y Y Y N Y Y Y U U Score: 8/12
Pokémon go and physical activity among college students. A study using ecological momentary assessment.	<p>Methods: This study used Ecological Momentary Assessment (EMA) to analyze the relationship between playing Pokemon GO and physical activity in US college students. The study included 123 participants, but only 74 (37 females, 37 males, and 77% white/Caucasian) were included in the final sample. Linear mixed effects regression models were used to address the relationship between gameplay and physical activity.</p> <p>Results: Playing Pokemon GO was associated with increased physical activity and positive effects on mental health, with players feeling less anxious, particularly during weekdays at 12pm. Playing while active and playing in greenspace were associated with increased physical activity and mental health.</p> <p>Conclusions: Playing Pokemon GO can potentially increase physical activity and mental health, especially in certain environments and at specific times. However, the study has limitations, including a biased sample and variations in step counting depending on where the smartphone is placed.</p>	Y Y Y Y N N N Y Y Y Y Y Y Score: 9/12
What can be learned from playing digital games outside school?	Methods: This study analyzed 49 students' forum posts in Moodle during the 2013 autumn semester. Students discussed the educational impact of their gaming experiences. Content analysis was used to examine the essays. Data was also collected from group discussions in examination seminars. All students in the course had	Y Y U Y Y Y Y N

	<p>to create a learning game prototype as part of the examination.</p> <p>Results: The study found that students believed they learned skills and knowledge from both commercial and learning games, which could be applied in non-gaming contexts. The most common learning outcomes were improved language and communication skills. The article suggests that gaming can be a valuable learning tool, but it should be combined with other teaching methods. The effectiveness of gaming depends on the accuracy of the game content and player engagement.</p> <p>Conclusion: The study suggests that gaming can be a valuable tool for learning, especially for the younger generation. However, it should be used alongside other teaching methods to maximize effectiveness.</p>	Y Y Y U U Score: 8/12
Playing a video game is more than mere procrastination.	<p>Methods: A qualitative study using semi-structured interviews with 20 Norwegian university students found that playing video games helped manage stress and improve their well-being.</p> <p>Results: The students reported that video games provided a sense of control and mastery, helping them relax and reduce stress levels. Video games were also a way to socialize with friends and take a break from academic work.</p> <p>Conclusion: The study suggests that video games could be used as a tool to improve mental health outcomes and promote well-being among university students but further research is needed to better understand its potential benefits and limitations.</p>	Y Y Y Y Y N Y Y Y Y Y Score: 11/12
How I cope at university: Self-directed stress management strategies of Australian students.	<p>Methods: This study, conducted with students from three universities in Australia, used a mixed-methods approach including focus groups and surveys to identify stress management strategies. With a total of 1,254 students completing the survey, data was collected through convenience sampling at various university events.</p> <p>Results: Results showed that exercise, socializing, gaming and listening to music were the most commonly used stress management strategies. Academic workload and financial concerns were the most commonly reported sources of stress.</p> <p>Conclusion: The study emphasizes the importance of promoting a range of stress management strategies tailored to individual students' specific sources of</p>	Y Y Y Y Y N Y Y Y Y Y Score: 11/12

	stress. Further research is needed to better understand the relationship between stress and academic performance among university students.	
Gender differences in stress of Community College students.	<p>Methods: The study used a College Stress Poll with 17 multiple-choice items to compare stress levels and attitudes towards stress workshops among 210 female and 141 male college students. Data were analyzed using Chi-square independence tests. The study was conducted in 2019 before the COVID-19 pandemic at one institution.</p> <p>Results: Male and female students had similar perceptions of their instructors' expectations and sources of stress in school. However, females experienced more stress in their relationships with family members. Female students also had more positive attitudes towards stress workshops at the college compared to male students. Males and females employed different coping strategies, with males favoring video games (59.6%) and females preferring sleep (67.1%).</p> <p>Conclusion: The study found that stress levels and attitudes towards stress workshops vary between male and female college students. However, the results may not apply to other community colleges in the same city, state, or region.</p>	Y Y N Y Y Y N N Y Y U U Score: 7/12
Impact of the global pandemic upon Young People's use of technology for Emotion Regulation.	<p>Methods: This study investigated how COVID-19 affected undergraduate students' emotional lives and behaviors. Data was collected from 154 participants from October 2019 to March 2020 and 82 participants from May to June 2020 using 17 questionnaires.</p> <p>Results: The study found that the pandemic and lockdowns caused significant changes in participants' use of digital devices to regulate emotions. However, their belief in emotion malleability and awareness of emotions remained high. The study also found that digital devices became increasingly important for emotional support during times of social isolation and restricted movements.</p> <p>Conclusion: Overall, the study provides empirical evidence for the use of digital devices for emotional regulation and how a high-impact event can influence individual behavior.</p>	Y Y N Y Y N N N U Y Y Score: 7/12
Help in the Time of COVID: Informational, Emotional, and Instrumental	Methods: This study explored the experiences of 22 graduate students from seven US universities, mainly from Florida, a COVID-19 hotspot. The focus was on stress, uncertainty, and social support. Data was collected through recorded and transcribed focus	Y Y U U Y

Support Among Graduate Students During a Pandemic	<p>groups using responsive interviewing. Thematic analysis revealed common themes and levels of relating between participants.</p> <p>Results: The study found significant stress and uncertainty among graduate students, exacerbated by the pandemic. It also identified effective sources of social support, including informational, instrumental, and emotional support.</p> <p>Conclusion: This study provides valuable insights into the experiences of graduate students during the pandemic. The study found that gaming takes the mind of students off uncertainty and stress.</p>	Y N Y N N Y Y Score: 7/12
College Students' Experiences on Prolonged Social Deprivation and Their Coping Mechanisms in the Midst of Community Quarantine	<p>Methods: The study interviewed 20 college students from the University of Saint Louis who experienced prolonged social deprivation during the community quarantine. The students were either completely isolated or had limited social interaction.</p> <p>Results: The study identified seven recurring themes in the students' experiences with prolonged social deprivation: Academic-Related Student Experiences, Interpersonal-Related Student Experiences, Personal-Related Experiences, and Anxiety-Related Experiences. The study also explored the coping strategies such as video games employed by the students.</p> <p>Conclusion: The study found that prolonged social deprivation during the COVID-19 pandemic negatively impacted the mental health of college students. Lack of in-person social interaction was a major contributing factor. However, students used various coping strategies, such as engaging in recreational activities, gaming and using social media. Social and institutional support are crucial in helping students cope with the negative effects of the pandemic.</p>	Y Y Y Y Y Y N Y N Y Y Y Score: 10/12

References

- Amos, P. M., Bedu-Addo, P. K., & Antwi, T. (2020). Experiences of online counseling among undergraduates in some Ghanaian universities. *SAGE Open*, 10(3), 215824402094184. <https://doi.org/10.1177/2158244020941844>
- Atler, K. E., & Sharp, J. (2019). Reported restorative experiences associated with everyday activities among university students. *British Journal of Occupational Therapy*, 82(10), 630–638. <https://doi.org/10.1177/0308022619859158>
- Atler, K. E., Eakman, A. M., & Orsi, R. (2018). College students' experiences of hedonia and eudaimonia in their everyday activities. *Canadian Journal of Occupational Therapy*, 85(1), 66–78. <https://doi.org/10.1177/0008417417727297>
- Dyrbye, L. N., Shanafelt, T. D., Sinsky, C. A., Cipriano, P. F., Bhatt, J., Ommaya, A., ... & West, C. P. (2014). Burnout among health care professionals: A call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspectives*.
- Essemiah, J., Fryz, R., Olson, R., Timmol, F., Upton, E., & Fateye, B. (2023). How are students coping one year after the COVID-19 lockdown? A photoelicitation project. *Journal of American College Health*, 1–13. <https://doi.org/10.1080/07448481.2022.2151841>
- Hamaideh, S. H. (2011). Stressors and reactions to stressors among university students. *International Journal of Social Psychiatry*, 57(1), 69-80.
- Johannes, N., Vuorre, M., & Przybylski, A. K. (2021). Video game play is positively correlated with well-being. *Royal Society Open Science*, 8(2). <https://doi.org/10.1098/rsos.202049>
- Laniton, J. M., Vallar, J. B., & Cuarteros, K. G. (2022). University Students' viewpoints: A coping mechanism amid the COVID-19 pandemic. *Canadian Journal of Family and Youth / Le Journal Canadien De Famille Et De La Jeunesse*, 14(3), 20–31. <https://doi.org/10.29173/cjfy29790>
- Liu, C. H., Stevens, C., Wong, S. H. M., Yasui, M., Chen, J. A., & Neiderhiser, J. M. (2019). The prevalence and predictors of mental health diagnoses and suicide among US college students: Implications for addressing disparities in service use. *Depression and Anxiety*, 36(1), 8-17.
- Marallag, E. J., Pabalinas, J. M., Pagulayan, J. P., Pascual, A., Tindowen, D. J., & Gavino, R. M. (2023). College Students' Experiences on Prolonged Social Deprivation and Their Coping Mechanisms in the Midst of Community Quarantine. *Psychology and Education: A Multidisciplinary Journal*, 6, 904–927. <https://doi.org/10.5281>
- Marquet, O., Alberico, C., & Hipp, A. J. (2018). Pokémon go and physical activity among college students. A study using ecological momentary

- assessment. *Computers in Human Behavior*, 81, 215–222.
<https://doi.org/10.1016/j.chb.2017.12.028>
- Mozelius, P. (2014). What can be learned from playing digital games outside school? *Proceedings of the European Conference on Games-based Learning*, 1, 415-422.
- Nordby, K., Løkken, R. A., & Pfuhl, G. (2019). Playing a video game is more than mere procrastination. *BMC Psychology*, 7(1).
<https://doi.org/10.1186/s40359-019-0309-9>
- Peltzer, K., & Pengpid, S. (2017). Prevalence of psychological distress and associated factors in university students in South Africa. *Journal of Psychology in Africa*, 27(4), 344-348.
- Reis, A., Saheb, R., Parish, P., Earl, A., Klupp, N., & Sperandei, S. (2021). How I cope at university: Self-directed stress management strategies of Australian students. *Stress and Health*, 37(5), 1010–1025.
<https://doi.org/10.1002/smi.3058>
- Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, 45(4), 249-257.
- Staser, T. (2021) Help in the Time of COVID: Informational, Emotional, and Instrumental Support Among Graduate Students During a Pandemic. *Electronic Theses and Dissertations*, 2020-. 565.
<https://stars.library.ucf.edu/etd2020/565>
- Strom, P. S., Strom, R. D., Sindel-Arrington, T., Rude, R. V., & Wang, C.-H. (2021). Gender differences in stress of Community College students. *Community College Journal of Research and Practice*, 46(7), 472–487.
<https://doi.org/10.1080/10668926.2021.1873872>
- Tag, B., van Berkel, N., Vargo, A. W., Sarsenbayeva, Z., Colasante, T., Wadley, G., Webber, S., Smith, W., Koval, P., Hollenstein, T., Goncalves, J., & Kostakos, V. (2022). Impact of the global pandemic upon Young People's use of technology for Emotion Regulation. *Computers in Human Behavior Reports*, 6, 100192.
<https://doi.org/10.1016/j.chbr.2022.100192>

Appendix A

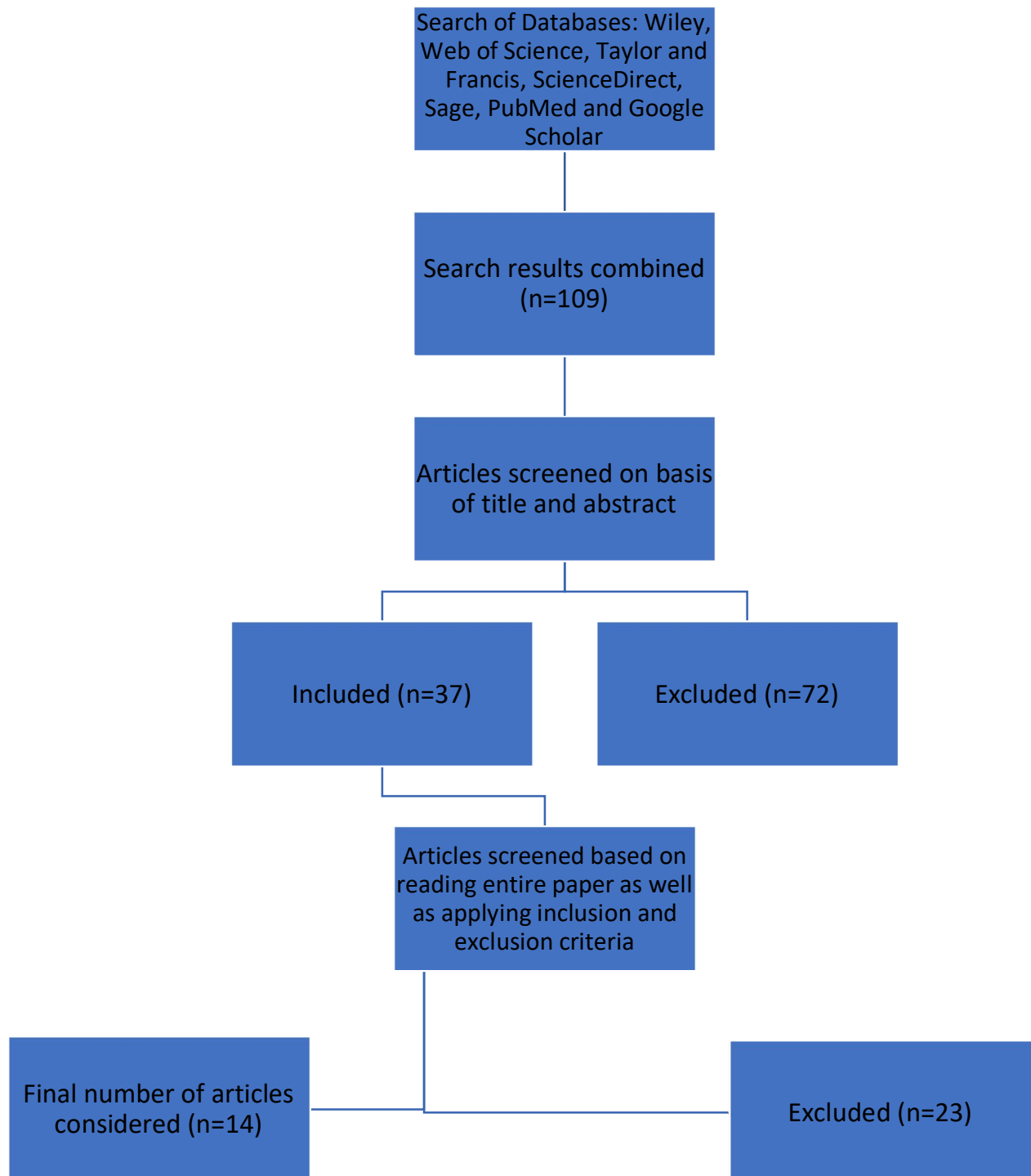


Figure 1. Flow diagram of the search strategy used in the systematic review. The search began with several databases and key words, resulting in a total of 109 articles. After screening based on titles and abstracts, 37 articles were selected for full-text review. Following a full-text review, 14 studies were included in the final analysis.