

Efficacy of Tactile Slime Toy: An Experimental Approach to Acute Stress Among College Students

Marie Assunta T. Omanhan¹, Zeisha Marielle R. Adorador², Kheicei-Ann D. Andes³,
Abegail S. Arceño⁴, Riela Annea G. Bernardo⁵, Shamma Maria Amor C. Martos⁶,
Darwin D. Diola⁷

Authors Information:

¹⁻⁷ Department of Psychology, University of Perpetual Help System Dalta- Molino

Correspondence:

darwin.diola@perpetual.edu.ph

Article History:

Date Received: May 6, 2026

Date Revised: May 17, 2026

Date Accepted: May 18, 2026

DOI:

<https://doi.org/10.5281/zenodo.20474219>

Document ID: 2026IJROMS0092

Recommended Citation: Omanhan, M. A. T., Adorador, Z. M. R., Andes, K.-A. D., Arceño, A. S., Bernardo, R. A. G., Martos, S. M. A. C., & Diola, D. D. (2026). Efficacy of Tactile Slime Toy: An Experimental Approach to Acute Stress Among College Students. *International Journal of Research on Multidisciplinary Studies*, 1(4), 382–390. <https://doi.org/10.5281/zenodo.20474219>

Abstract. Stress is a common experience among first-year college students as they transition into higher education and cope with increased academic, social, and personal demands. While evidence-based stress management techniques exist, many require training, time, or professional guidance, limiting their accessibility. Recently, tactile sensory tools such as slime have gained popularity as informal stress-relief strategies; however, empirical support for their effectiveness among non-clinical adult populations remains limited. This study investigated the effect of a slime-based sensory intervention on acute stress levels among first-year psychology students. Using an experimental quantitative design with a between-subjects pretest–posttest approach, 30 students from the University of Perpetual Help System DALTA – Molino Campus were randomly assigned to either a slime intervention group or a control group with no stress-relief tool. Stress levels were measured before and after the intervention using a standardized self-report instrument. Paired-samples *t*-tests revealed a statistically significant reduction in stress levels within the slime group, whereas no significant change was observed in the control group. However, independent-samples *t*-tests indicated no significant difference in post-intervention stress levels between groups. These findings suggest that while slime use may produce short-term stress reduction for individuals, its overall effect may be insufficient to yield measurable differences at the group level. The study concludes that slime may serve as a supplementary, low-cost stress-relief option rather than a standalone intervention. Implications align with Sustainable Development Goal 3 (Good Health and Well-Being), supporting the exploration of accessible mental health strategies within higher education contexts.

Keywords: Academic Stress; College Students; Sensory-based intervention; Slime; Stress Management; Tactile Stimulation

Introduction

Stress is a normal response of an individual when faced with challenges and demands of life. In a college setting, stress is a prevalent issue among first-year students. Transitioning from high school to college is a major life change for students, and it often involves academic, social, and personal demands. These demands can increase stress levels and impact students' focus, emotions, and overall well-being (Pascoe et al., 2019). High levels of stress can impact academic and mental health outcomes, and it is essential for students to manage stress levels. Several methods have been proposed for managing stress among students. These methods include mindfulness, relaxation techniques, physical exercise, and cognitive-behavioral techniques. However, these methods may sometimes require training, guidance, and expertise. Thus, students often need simpler and more convenient ways of managing stress. One of these methods of sensory-based stress management tools is a slime toy. These tools are designed for students to use and involve moving hands and stimulating sensory inputs. These sensory inputs can calm students and increase focus and reduce nervous energy (Liu, 2025; Weng, 2025). However, there is limited research on its effectiveness for adult students.

To deal with such a situation, different strategies have been implemented in academic settings to reduce stress among students. Some of these strategies include mindfulness-based interventions, relaxation techniques, physical exercises, and cognitive behavioral techniques. These strategies have been found to be effective in improving coping skills and reducing symptoms of stress. However, these strategies require proper training and guidance. Some students may find it hard to perform these strategies because of a lack of time or other reasons. Recently, a new trend has been observed that can be used by students as an informal strategy to deal with stress. This new trend includes sensory tools such as slime. This tool requires repetitive hand movements and tactile interaction. Repetitive hand movements and sensory stimulation have been discussed as a possible tool to deal with nervous energy and self-control. According to Liu (2025), sensory

material such as slimes may be supported by theories of self-regulation, which state that repetitive hand movements can be helpful in reducing excess stimulation and focusing on a particular activity. Moreover, Weng (2025) reviewed different products used to reduce stress and found that tactile interaction can affect perceived levels of stress by activating sensory systems related to emotional processing. Vanhersecke (2021) also pointed out that the rise in popularity of "oddly satisfying" sensory experiences, like watching or playing with slime, may be connected to deeper psychological processes that have to do with mirror neurons and controlling emotions. These activities create a feeling of control and predictability that can be calming. This suggests that playing with slime may not only be fun for the senses, but it may also cause physical reactions that help people relax and relieve stress.

From a cognitive perspective, stress and attention are closely linked. Elevated stress may impair working memory, reduce attentional control, and increase cognitive overload (Pascoe et al., 2019). When individuals experience heightened arousal, their ability to sustain focus and regulate emotions may decline. If tactile sensory engagement influences attentional processes, it may also interact with immediate stress experiences. However, while theoretical explanations suggest a possible connection between sensory stimulation and stress regulation, empirical findings remain limited and inconsistent.

While slimes are becoming increasingly popular among students, there is still limited research on the effectiveness of tactile sensory tools among non-clinical adult populations. The majority of existing research has been conducted on child populations or on people suffering from attention-related problems, and some research has been descriptive or correlational in nature rather than experimental in design. Thus, there is a lack of sufficient research that has been conducted to determine if tactile sensory tools are effective in causing changes in acute stress among non-clinical adult populations, such as college students.

This research is important because it is conducted in a higher educational setting, and there is a need to ensure that stress management practices are supported by research rather than assumption or trend. Examining the potential impact of touch-based sensory tools on acute stress levels is important for exploring effective mental health interventions in educational settings. By measuring changes in acute stress, this research aims to determine whether these tools can influence stress levels among first-year college students (Baktash, Kim, & Shirazi, 2024).

In addition, this research inquiry is in line with Sustainable Development Goal 3, or Good Health and Well-being, which highlights the importance of promoting mental health and well-being, and preventive measures among all populations. Mental health support in educational settings is a key aspect in achieving this sustainable development goal, given that students are a population that is particularly vulnerable to stress-related issues. The creation of empirical evidence on basic, cost-effective, and easily accessible stress management tools can contribute to evidence-based practice aimed at improving student well-being in higher educational settings, and this research study is a systematic inquiry into the support of student well-being in higher educational settings.

Research Questions

This research study seeks to answer the following questions:

1. Is there a significant difference between the Stress Level of participants before and after using slime?
2. Is there a significant difference between the Stress Level of participants before and after with no stress relief tools?
3. Is there a significant difference in participant's Stress Level before and after among those who used a stress relieving method and those with none?

Scope and Delimitation of the Study

The scope and delimitation of this study focuses on examining the effectiveness of slime as a sensory-based intervention for reducing acute stress among first-year Psychology students at the University of Perpetual Help System DALTA – Molino Campus during the second semester of Academic Year 2025–2026. Specifically, the study investigates changes in participants' stress levels before and after exposure to a slime intervention using an experimental quantitative between-subjects design with pre-test and post-test measures. The participants are limited to 30 first-year Psychology students who were randomly assigned to either the slime intervention group or the control group with no stress-relief tool. Stress levels were measured using an adapted version of the Perceived Stress Scale (PSS) focused on current or momentary stress. The study is delimited to short-term stress reduction only and does not assess long-term psychological effects or clinical mental health outcomes. Furthermore, the study excludes individuals diagnosed with anxiety disorders, those currently taking psychiatric medication, and those with sensory processing disorders. The findings are also limited to the selected institution and may not be generalized to students from other academic programs, age groups, or universities.

Literature Review

Stress and Coping Theory in Relation to Acute Stress Relief

Stress is defined as a psychological process including a person's perception of expectations and ability to deal with them. Stress, according to Lazarus and Folkman (1984), comes when people perceive that a situation is beyond their coping abilities. They defined emotion-focused coping as a strategy for managing emotional suffering rather than removing the stressor itself. Slime toys can be utilized as emotion-focused coping strategies in situations of acute stress, such as sudden academic pressure or performance-related worry. Rather than removing the source of stress, these tactile materials aid in regulating immediate emotional responses. Supporting this theoretical hypothesis, Gerçeker et al. (2024) discovered that children who used stress balls during medical procedures had much lower anxiety levels than those who did not. Yeniğün and Demir Korkmaz (2025) found that patients who utilized stress tools during surgery experienced lower anxiety and improved physiological indicators. These data show that tactile instruments can successfully lower acute stress responses, highlighting the applicability of Lazarus and Folkman's (1984) coping theory to this investigation.

Sensory Play and Emotional Regulation

Tactile stimulation is vital for emotional control. Schaaf and Mailloux (2015) argued that sensory integration through touch and movement aids in the regulation of neuronal responses and the maintenance of emotional balance. Squeezing, stretching, or manipulating objects activates sensory pathways, which can help to soothe the nervous system. Relating this to the present study, slimes provide direct tactile engagement through repetitive hand movements and textured feedback. These sensory properties may help interrupt acute stress responses by shifting focus from distress to controlled physical stimulation. Further corroborating this, Essick et al. (2017) found that tactile sensory play increases emotional regulation by engaging many sensory systems at once. Participants who engaged in hands-on sensory exercises had lower stress levels and more emotional peace. This lends credence to the notion that slime and other tactile instruments could be accessible and effective stress-relieving therapies during acute stress episodes.

Slime as a Therapeutic Intervention

People use sensory materials to help them relax and deal with stress. Liu (2025) says that sensory materials can help you focus better and relax because they involve touch and simple hand movements. These things can help people relax and focus better. Prendergast (2020) says that sensory play therapy uses things you can touch to help you feel better emotionally. Touching and playing with soft, flexible things can help people feel less anxious and let them say how they feel in a simple way. You can squeeze, stretch, and mold slime over and over again. It has a calming effect when you touch and move it. For this reason, slime may help students relax and feel less stressed (Liu, 2025; Prendergast, 2020).

Sensory Materials and Stress Reduction

Hands on sensory materials such as putty and slime have been linked to measurable stress reduction. Akar & Konuk Şener (2025) conducted a randomized controlled trial showing that playdough activities significantly reduced anxiety and pain levels undergoing venipuncture procedures, compared to a control group. This demonstrates that sensory materials can help decrease acute stress responses through tactile engagement. According to Yerkes Dodson (1908), moderate stimulation can help regulate emotional responses and improve focus, which is related to how sensory activities calm the nervous system. Later research by Temple Grandin (1992) suggested that tactile sensory input, such as squeezing or manipulating soft materials, can reduce anxiety by providing calming pressure and sensory feedback. This indicates that engaging with materials like slime or putty may help individuals manage stress by providing controlled sensory stimulation.

This established a well-defined relationship that links the role of tactile engagement in the mitigation of acute stress level, thus validating the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) as well as Sensory Integration Theory (Ayres, 1972). In addition, the clinical evidence provided by Gerçeker et al. (2024) and Yeniğün & Demir Kormaz (2025) supports the idea that tactile tools such as stress balls can effectively reduce the anxiety levels of individuals through the provision of a physical channel for emotional control. Moreover, studies conducted by Akar & Konuk Şener (2025) and Essick et al. (2017) demonstrated that sensory-based instruments such as putty and slime assist in the emotional regulation of an individual through the stimulation of multiple senses simultaneously. Furthermore, the researchers acknowledges that the choice of slime toys was influenced by the prominent cultural visibility of such instruments in society, as well as the sensory-based trends that exist in modern digital culture; however, this study aims to move beyond their recreational popularity to objectively assess their efficacy as legitimate emotion-focused coping

mechanisms in mitigation of acute stress levels, thus determining the statistical significance of the role of such instruments in the improvement of cognitive and emotional regulation, as suggested by Schecter et al. (2017). Furthermore, studies by Temple Grandin (1992) suggest that tactile sensory input can provide calming feedback that helps reduce anxiety and emotional tension. Similarly, Mihaly Csikszentmihalyi (1990) explained that engaging in simple hands-on activities can promote relaxation by allowing individuals to focus their attention away from stressors. These findings further support the role of sensory materials as effective tools for stress reduction and emotional regulation.

Methodology

Research Design

This study utilized Experimental Quantitative Research, specifically a between-subject design. Experimental research is a scientific method used to examine the relationship between independent and dependent variables. It is commonly used to establish cause-and-effect relationships and to test hypotheses (Sreekumar, D., 2024). A between-subject design is an experimental research design in which different participants are assigned to each condition or group, and each participant is exposed to only one level of the independent variable. This design facilitates comparisons between separate groups to determine the effect of the manipulated variable while avoiding carryover or practice effects that can occur when the same participants are exposed to multiple conditions (Simkus, 2024). Researchers often choose between-subject designs because they help control for validity threats by isolating the effect of the intervention from other non-causal influences, even when random assignment is not fully possible (Sheehan et al., 2024). In this study, a pre-test and post-test design will be used to measure the effect of the sensory intervention on participants' stress levels. Participants will first complete a pre-test to assess their baseline stress levels before exposure to the intervention. They will then be assigned to one of two conditions: slime group or control group (no intervention). After the intervention, a post-test will be administered to measure stress levels again. Comparing pre-test and post-test scores will allow the researchers to determine whether the intervention produced changes in the dependent variable, which is the participants' stress level (Creswell & Creswell, 2018).

Sampling Design

The sample size was determined based on recommendations for experimental research, which suggest a minimum of 15 participants per group to allow for meaningful comparison between control and experimental conditions (Cohen et al., 2007; Gall et al., 1996). This sample size also meets the general guideline in quantitative research that at least 30 participants are needed to achieve a more stable distribution of data and improve the reliability of statistical estimates (Budi & Moran, 2021). The selection of participants will be done using simple random sampling, a probability sampling technique in which every member of the population has an equal chance of being chosen, thus minimizing selection biases and increasing the sample's representativeness (Cohen et al., 2018). The method of sampling will be suitable for this study since this will allow for the equal selection of participants from the same academic population, and every first-year psychology student will have an equal chance of participating in this study. The participants will be from one academic institution, and this will increase the chances of the participants' academic environment affecting their behavior during the experimental procedure, since they will all be from the same academic environment.

Research Locale

The study will be conducted at University of Perpetual Help System DALTA, specifically within the College of Psychology during the second semester of Academic Year 2025–2026. The institution is located in Molino, Bacoor City, Cavite, Philippines, and serves as the research locale because it provides access to first-year Psychology students who are the target participants of the study. The campus environment is considered appropriate for the conduct of the research due to the academic demands experienced by students, which may contribute to stress-related experiences relevant to the study. Data collection will be carried out in a controlled classroom setting to ensure consistency in the administration of the pre-test, intervention procedure, and post-test among participants.

Research Participants

The research participants for this study will consist of 30 first-year Psychology students from the University of Perpetual Help System DALTA – Molino Campus, enrolled during the 2nd semester of Academic Year 2025–2026. The participants will be randomly assigned into two groups, with 15 students in the slime group and 15 students in the control group. Random assignment will be used to minimize individual differences among participants and to enhance the validity of the experimental results (Cohen et

al., 2018). Inclusion in the study requires that participants are first-year Psychology students of the University of Perpetual Help System DALTA – Molino Campus, currently enrolled in the specified semester, and have provided signed informed consent. Participants will be excluded from the study if they have been diagnosed with anxiety disorders (if applicable), are currently taking psychiatric medications, or have sensory processing disorders.

Research Instrument

The main instrument used for measuring perceived stress was a Current Stress Questionnaire adapted from the Perceived Stress Scale (PSS) which is based on the original one developed by Sheldon Cohen et al. (1983). The original PSS is designed to assess the perceived level of stress experienced during the previous month. In this study, the scale was adapted to measure momentary or current stress; therefore, all items of the scale were rephrased as "feelings right now". This questionnaire includes ten items which measure unpredictability, uncontrollability, and feeling overwhelmed. The responses were rated using the five-point Likert scale: 0 for "never", 1 for "almost never", 2 for "sometimes", 3 for "fairly often" and 4 for "very often". The instrument was given to each participant twice: the first time as the pre-test before the intervention, and the second one as the post-test immediately after the intervention. Items 4, 5, 7, and 8 were reverse-scored according to the recommended procedures. The reverse-scored items were added to obtain the total score of the test which could range between 0 and 40; hence, the higher the score, the higher momentary stress. The PSS was chosen because of its brevity, widespread use, and capability of being used several times in experiments. At the same time, the subjective nature of the instrument can cause response bias, so future studies can consider physiological variables such as heart rate. No confidential data, only numbers of participants' code were recorded. The Stress Questionnaire demonstrated an acceptable level of internal consistency reliability, with a Cronbach's alpha of .795, indicating that the items are sufficiently consistent in measuring the same construct.

Data Gathering Procedure

The data gathering procedure consisted of four phases to ensure a systematic, ethical, and organized collection of data. In the first phase, which involved preparation and planning, the researchers identified the target population consisting of 30 first-year Psychology students from the University of Perpetual Help System DALTA – Molino Campus. The participants were equally divided, with 15 assigned to the slime group and 15 to the control group through random assignment to reduce individual differences and enhance the validity of the experimental results. During this phase, all research materials were prepared, including informed consent forms, the adapted Perceived Stress Scale to measure participants' stress levels, the slime materials for the experimental group, and standardized instructions for the control group. The stress scale was also reviewed and refined for clarity and ease of understanding. In the second phase, which involved data collection, participants first completed a pre-test using the adapted Perceived Stress Scale to determine their baseline stress levels. They were then randomly assigned to either the slime group or the control group. The slime group engaged with the slime activity for approximately 10–15 minutes, while the control group remained seated quietly without any intervention for the same duration. Immediately after the intervention, all participants completed a post-test using the same stress scale to measure any changes in stress levels. In the third phase, data organization and recording were conducted, where all pre-test and post-test scores were compiled, labeled according to group assignment, and securely stored while maintaining participant confidentiality and anonymity. In the final phase, data analysis and interpretation were performed by comparing pre-test and post-test scores to evaluate the effect of the intervention on stress levels. The results were interpreted to determine whether the use of slime effectively reduced momentary stress among first-year Psychology students, and these findings served as the basis for the study's conclusions and recommendations.

Results and Discussions

Research Question 1: Is there a significant difference between the Stress Level of participants before and after using slime?

Table 1. Paired Samples t-Test for Stress Level Before and After Using Slime

Variables	T	P-value	Decision	Conclusion
Stress level before and after using slime	3.61	.003	Since P-value < .05, reject null hypothesis	Significant

Table 1 presents a paired-samples *t*-test that was conducted to examine whether there was a significant difference in participants' stress levels before and after using slime. The results revealed a statistically significant difference in stress levels, $t = 3.61$, $p = .003$. Since the obtained *p*-value is less than the .05 level of significance, the null hypothesis was rejected. This indicates that the use of slime had a significant effect on participants' stress levels, suggesting that stress levels changed after the intervention. Several academic research supports this finding suggesting that slime, as a tactile and sensory-based material, plays a significant role in reducing stress. Sadri & Moodithaya (2024) explained that sensory fidget toys such as slime reduce psychological tension through tactile stimulation and repetitive hand engagement, which help emotional responses and promote relaxation. Additionally, Liu (2025) further supports it by emphasizing how sensory fidget toys operate through sensory engagement and attentional focus that contributed to stress reduction and improved emotional regulation. Moreover, Kimport & Hartzell (2015) provided experimental evidence that similar tactile materials, such as clay, has significantly reduced the anxiety levels in a pretest-posttest design, supporting the effectiveness of hands-on interventions in stress reduction.

Research Question 2: Is there a significant difference between the Stress Level of participants before and after with no stress relief tools?

Table 2. Paired Samples t-Test for Stress Level Before and After Without Stress Relief Tools

Variables	T	P-value	Decision	Conclusion
Stress level before and after with no stress relief tools	.95	.361	Since P-value > .05, accept null hypothesis	Not Significant

Table 2 shows a paired-samples *t*-test was conducted to determine whether there was a significant difference in participants' stress levels before and after the period without the use of stress relief tools. The results indicated no statistically significant difference in stress levels, $t = 0.95$, $p = .361$. Since the obtained *p*-value is greater than the .05 level of significance, the null hypothesis was accepted. This suggests that participants' stress levels did not significantly change when no stress relief tools were used. Supported by several previous controlled experimental studies, these findings emphasise that stress levels remain relatively unchanged when no stress relief tools or interventions are applied. Studies such as Saleh et al. (2017), a randomized controlled trial among university students, found no significant improvement in stress levels in the control condition without stress management training, while Holm et al. (2010) also reported that there were no significant changes in stress levels among medical students who underwent their experiment. Moreover, Velana and Rinkenauer (2021) explained that stress reduction is only observed when coping interventions are applied, while non-intervention groups generally show stable stress levels.

Research Question 3: Is there a significant difference in participant's Stress Level before and after among those who used a stress relieving method and those with none?

Table 3. Independent Samples t-Test Comparing Stress Levels Between Slime and No Tool Groups

Variables	T	P-value	Decision	Conclusion
Stress level before of those who used slime and those with none	1.77	.087	Since P-value > .05, accept null hypothesis	Not Significant
Stress level after of those who used slime and those with none	-.16	.873	Since P-value > .05, accept null hypothesis	Not Significant

Table 3 presents an independent-samples *t*-test that was conducted to examine whether there was a significant difference in stress levels between participants who used slime and those who did not, both before and after the intervention. The results showed that there was no statistically significant difference in stress levels before the intervention, $t = 1.77$, $p = .087$, indicating that the two groups were comparable at baseline. Similarly, there was no statistically significant difference in stress levels after the intervention, $t = -0.16$, $p = .873$. Since both *p*-values are greater than the .05 level of significance, the null hypotheses were accepted. These findings suggest that there is no significant difference in stress levels between participants who used

slime and those who did not, both prior to and following the intervention. This suggests that as a sensory-based intervention, slime may have limited effectiveness in producing measurable reductions in stress levels within the duration of the study. Moreover, slime appears to show a certain degree of inefficiency in eliciting substantial effects on stress levels throughout the course of the experiment. Although sensory-based tools are often considered helpful in promoting relaxation, they might not be sufficient enough in ensuring consistent psychological benefits that are needed to ensure meaningful stress improvement. In a previous study, Sadri & Moodithaya (2021) found that fidget toys such as slime and stress-relief tools did not significantly alter most physiological stress indicators measured through heart rate variability in young adults. Additionally, Pettijohn & Riley-Lomedico (2023) reported that the use of fidget spinners and stress balls did not significantly impact psychological or performance outcomes among college students. Weng (2025) reported in a review of sensory-based stress-relief tools that fidget toys show inconsistent effectiveness in reducing stress, with outcomes varying across populations and contexts, suggesting that these interventions may not reliably produce measurable stress reduction in typical student samples. Overall, these studies collectively suggest that sensory-based interventions such as slime may have limited and inconsistent effects on stress reduction, which aligns with the non-significant differences observed in this study's findings.

Ethical Considerations

The research will follow the guidelines of the ethics of research involving human subjects, and the Institutional Ethics Review Committee of the University of Perpetual Help System DALTA will review the research for approval prior to the data collection process. The research will be conducted in accordance with the Data Privacy Act of 2012 (RA 10173), where all information gathered will be considered confidential and private. The information provided by the respondents will not be linked to the respondents' names, and unique codes will be assigned for the purpose of ensuring the respondents' anonymity. Hard copies of the data will be stored in a locked cabinet, while the digital version will be encrypted using a password. Prior to the data collection, the respondents will be provided with an informed consent form that will include the objectives, procedures, duration, potential harm, and benefits of the research. Participation of the respondents will be voluntary, and only those who have signed the consent form will be considered respondents of the research. The research intervention includes the manipulation of slime toys for a short period of time, which will amount to a very minimal risk for the respondents. There will be no deception of the respondents throughout the entire data collection process. After the data collection, the respondents will be debriefed about the objectives of the research, and all questions and clarifications will be entertained. All respondents will be treated equally through the use of standardized procedures, and the researchers are committed to honest data collection, objective data analysis, and honest data reporting without any manipulation of the data collected.

Conclusion

The study examines the effect of slime as a means of reducing stress based on the participants' stress levels before and after engaging in using it for stress relief, as well as comparing these levels to those in the control group who were not provided with any kind of intervention aimed at stress reduction. The data shows that there is a statistically significant difference in participants' stress levels pre- and post-usage of slime, which indicates that slime had a significant effect on participants and their stress levels. On the contrary, people who had not been subjected to any stress-relief intervention showed no statistical changes in their stress levels. In addition, when comparing the data of participants in both groups, the comparison of pre-test and post-test scores shows that there were no statistically significant differences between groups. It means that despite having a significant effect on the individuals' stress levels, this effect was too weak to produce a significant difference in groups' scores. Overall, the current study proved that slime could have an effect on the participants' stress levels and act as a stress-relief tool. At the same time, this effect does not seem to produce any significant difference between groups when used for stress-relief purposes. Slime toys may not replace structured interventions, but they represent an accessible, immediate coping tool that can complement existing stress management strategies in higher education.

Recommendations

Based on the findings of the study, several recommendations are proposed for different stakeholders. For students, the use of slime or other sensory aids may be considered as a simple, accessible, and low-cost strategy for stress reduction, as active engagement in such activities may help promote relaxation and improve concentration. For teachers, it is recommended that stress-relieving activities be integrated into classroom practices by allowing short breaks where students can engage with tactile materials such as slime, which may help reduce stress levels while supporting learning engagement. For schools, it is suggested that institutional programs focusing on mental health awareness and stress management be strengthened to equip students with effective coping strategies, thereby improving the overall psychological climate within

the academic environment. For future researchers, it is recommended that further studies be conducted using larger sample sizes and longer intervention periods, as well as comparative analyses of different stress-reduction techniques using appropriate statistical measures such as mean scores and standard deviation to determine relative effectiveness.

References

- Akar, A., & Konuk Şener, D. (2025). The effect of play dough activities before the venipuncture procedure on pain and anxiety level in children: A randomized controlled study. *Balıkesir Sağlık Bilimleri Dergisi*, 14(1), 164–171. <https://doi.org/10.53424/balikesirsbd.1582335>
- Alkharusi, H. (2022). A descriptive analysis and interpretation of data from Likert scales in educational and psychological research. *Indian Journal of Psychology and Education*, 12(2), 13–16. <https://www.researchgate.net/publication/373096780>
- Baktash, H., Kim, D., & Shirazi, A. (2024). Beyond sight: Comparing traditional virtual reality and immersive multi-sensory environments in stress reduction of university students. *Frontiers in Virtual Reality*, 5. <https://www.researchgate.net/publication/367044021>
- Budiu, R., & Moran, K. (2021). How many participants for a quantitative usability study? Nielsen Norman Group. <https://www.nngroup.com/articles/summary-quant-sample-sizes/>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge. <https://doi.org/10.4324/9780203771587>
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education*. Routledge. <https://doi.org/10.4324/9781315456539>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385–396. <https://doi.org/10.2307/2136404>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Dehnavi, M., et al. (2025). The effect of stress ball squeezing on pain and anxiety during intravenous catheterization in hospitalized children: A randomized clinical trial. *Scientific Reports*, 15(1), 1024. <https://doi.org/10.1038/s41598-025-85881-2>
- Elahi, H., Son, H. M., Calub, C. A., Nasiri, N., Shapiro, D., Isbister, K., Borden, J., Hastings, P. D., Liu, X., & Schweitzer, J. B. (2025). Impact of fidget devices on anxiety and physiological responses in adults with ADHD. *Research in Developmental Disabilities*, 158, 104944. <https://doi.org/10.1016/j.ridd.2025.104944>
- Field, A. P. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE.
- Gerçeker, G. Ö., Bektaş, İ., & Yardımcı, F. (2024). The effects of virtual reality and stress ball on procedure-related emotional appearance, pain, fear, and anxiety during phlebotomy in children: A randomized controlled study. *Journal of Pediatric Nursing*, 79, 197–204. <https://doi.org/10.1016/j.pedn.2024.08.029>
- Graziano, P. A., Garcia, A. M., & Landis, T. D. (2020). To fidget or not to fidget, that is the question: A systematic classroom evaluation of fidget spinners among young children with ADHD. *Journal of Attention Disorders*, 24(1), 163–171. <https://doi.org/10.1177/1087054718770009>
- Guardado, K. E., & Sergent, S. R. (2025). Sensory integration. In *StatPearls*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK559155/>
- Holm, M., Tyssen, R., Stordal, K. I., & Haver, B. (2010). Self-development groups reduce medical school stress: A controlled intervention study. *BMC Medical Education*, 10, 23. <https://doi.org/10.1186/1472-6920-10-23>
- Kimport, K., & Hartzell, E. (2015). Using clay as a tactile intervention to reduce anxiety in a pretest–posttest experimental design. *Journal of Art Therapy and Mental Health*, 2(1), 1–10.
- Liu, Y. (2025). The rise of sensory fidget toys: Origins, psychological principles, and their role in stress relief and mental health. *SHS Web of Conferences*, 213, 02027. <https://doi.org/10.1051/shsconf/202521302027>

- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, 22(1), 67–72. https://doi.org/10.4103/aca.ACA_157_18
- Obbarius, N., Fischer, F., Liegl, G., Obbarius, A., & Rose, M. (2021). A modified version of the transactional stress concept according to Lazarus and Folkman. *Frontiers in Psychology*, 12, 584333. <https://doi.org/10.3389/fpsyg.2021.584333>
- Pallant, J. (2020). *SPSS survival manual*. McGraw-Hill Education.
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112. <https://doi.org/10.1080/02673843.2019.1596823>
- Pettijohn, T. F., & Riley-Lomedico, V. (2023). Using fidget spinners and stress balls do not impact college introductory psychology test scores. *Advances in Research*, 24(6), 9–13. <https://doi.org/10.9734/air/2023/v24i6978>
- Polat, S., & Burucu, R. (2025). The effect of stress ball use on anxiety levels in adults during blood collection: A randomized controlled trial. *Journal of Clinical Nursing*. Advance online publication. <https://doi.org/10.1111/jocn.17222>
- Saleh, D., Camart, N., Sbeira, F., & Romo, L. (2018). Can we learn to manage stress? A randomized controlled trial carried out on university students. *PLOS ONE*, 13(9), e0200997. <https://doi.org/10.1371/journal.pone.0200997>
- Sayar, S. E., Barbak, Z. D., & Delice, O. (2025). Effect of stress ball use on fear and anxiety during pediatric casting procedures. *Journal of Trauma Nursing*, 32(3), 134–140. <https://doi.org/10.1097/JTN.0000000000000852>
- Simkus, J. (2024). Between-subjects design: Overview & examples. *Simply Psychology*. <https://www.simplypsychology.org/between-subjects-design.html>
- Velana, M., & Rinkenauer, G. (2021). Individual-level interventions for decreasing job-related stress. *Frontiers in Psychology*, 12, 708696. <https://doi.org/10.3389/fpsyg.2021.708696>
- Weng, J. (2025). A review of the effectiveness of three main types of stress-reduction products. *Humanities and Social Science Research*, 8(5), 141–147. <https://doi.org/10.30560/hssr.v8n5p141>
- Yeniğün, S. C., & Demir Korkmaz, F. (2025). The effects of stress ball practice on patient anxiety. *Pain Management Nursing*, 26(5), 592–599. <https://doi.org/10.1016/j.pmn.2025.04.009>
- Yüksel, D., & Güneş, D. (2024). The effect of stress ball on anxiety and pain levels in angiography. *Cardiovascular Therapeutics*, 2024, 5049092. <https://doi.org/10.1155/2024/5049092>