

Mathematics Lesson Game with Trauma Healing for Flood Victim Children in Makassar City

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Abstract

The purpose of this study is to treat trauma and promote holistic healing among the children of Kota Makassar by examining the effect of including mathematical games into their educational experience. The study uses a qualitative research approach, conducting interviews and keeping detailed notes on the participants' post-intervention trauma levels. Initial results suggest promising enhancements in emotional well-being, with participants reporting feelings of happiness, empowerment, and a more optimistic view of their academic ability. Aligning with known theories in developmental psychology, recent years have seen the introduction of notions like "playful learning" and "academic empowerment," both of which contribute theoretically to our knowledge of trauma healing in educational environments. Despite the encouraging nature of these qualitative findings, a more thorough understanding of the long-term effects of trauma-informed education requires additional study that incorporates quantitative measures and longitudinal evaluations. Educators, politicians, and academics can use the study's practical and theoretical contributions to inform the creation of successful ways for assisting children recovering from trauma in post-disaster situations.

Keywords: Mathematics, Lesson Game, Flood Victim.

Introduction

Makassar, an Indonesian city in South Sulawesi, is no stranger to floods, which have repeatedly disrupted people's lives and wreaked havoc on the city's infrastructure. The emotional and mental health of Kota Makassar's population, especially its children, has been negatively affected by the city's recurrent flooding.

The disruption of important services, such as schools, is just one of the many problems that floods cause (Mavhura, 2020). Children, as a particularly vulnerable group, are often the ones to face the brunt of these issues, feeling both the physical and emotional impacts of the disruptions in their life (Surjan et al., 2016).

Understanding and responding to the psychological effects of the floods in Kota Makassar on children who were affected by these events is the focus of this study. The purpose of this study is to examine the feasibility of using mathematical games as part of educational treatments to promote healing and resilience among young trauma survivors. Our hope is that the information we glean from this investigation will help shape future efforts to aid the full recovery of children who were displaced by the floods in Makassar, and that these efforts will serve as a model for similar situations around the world.

More frequent and severe flooding events have occurred in Makassar, making life more difficult for locals. There is an immediate and

long-term need for actions to address the socio-economic repercussions and the disruption of critical services like schooling (Rasul et al., 2021).

Children, as a particularly defenseless group, are more open to the psychological effects of such occurrences. Young people's ability to learn and thrive is negatively impacted by traumatic experiences, which also have an impact on their emotional health. The students of Kota Makassar who were impacted by the recent flooding are a target population for this study because of the need to integrate trauma healing into mathematics teaching.

Our goal is to help bridge the gap between the immediate post-flood recovery period and the start of regular educational activities by emphasizing mathematical games as a tool for both education and healing. Understanding that educational interventions can play a crucial role in addressing the emotional needs of children and building a sense of normalcy in their lives is central to this study's multifaceted approach to post-disaster recovery.

As we delve into the details of this study, we hope that the results will provide educators, politicians, and community leaders in Makassar and beyond with actionable solutions for implementing trauma-informed education. The long-term objective is to develop a structure that gives kids not only relief from the immediate effects of floods, but also the means to recover and thrive in the years to come.

The effects of the repeated flooding in Kota Makassar on the city's most defenseless residents, the city's children, go far beyond the obvious wreckage. A sense of uncertainty and loss can result from forced evacuations, which disturb the stability necessary for healthy development. Experiencing trauma during a flood can increase emotional discomfort and lead to symptoms like anxiety and PTSD (Asim et al., 2022). Disruptions to a child's education, such as those caused by school closures or damage, might have negative effects on their cognitive growth and self-esteem (Engzell et al., 2021). Contaminated floodwaters pose additional threats to the health of young

survivors, threatening their ability to recover. The pressure of adjusting to these new dynamics can lead to increased feelings of loneliness. Focusing on the integration of trauma healing into mathematics education as a comprehensive method to help children's recovery and resilience, this study attempts to dive into the psychological consequences on children post-flood in Kota Makassar.

The goal of this study is to prepare the ground for targeted interventions that go beyond immediate rescue efforts by providing a complete understanding of the varied impact of floods on children. Young survivors face a tangled web of difficulties due to the emotional toll, interrupted education, and altered social dynamics (Bjørnholt, 2019). We hope to do more than just help these kids cope with their immediate pain by exploring novel approaches, like incorporating math games into their schooling. Through this study, we hope to provide actionable insights that can guide individualized plans to help children in Kota Makassar recover from the effects of the recent floods and serve as a model for other communities facing similar threats to their infrastructure and educational infrastructure.

Our studies of post-flood rebuilding acknowledge the connection between trauma and education. In the wake of devastating floods, there is a window of opportunity to rethink the role of learning in fostering recovery and development. By using math games, we may help bridge the gap between trauma-informed care and academic engagement, recognizing the critical role education plays in helping these kids get back to normal.

Our goal is to evaluate the efficacy of this novel method by combining quantitative analyses with qualitative observations. By assessing changes in trauma levels and watching adjustments in the children's involvement and emotional well-being, we intend to give real evidence that guides future educational initiatives in post-disaster circumstances. This study aims to do more than just deal with the immediate aftermath of floods; rather, it hopes to provide teachers,

policymakers, and communities with long-term resources for building kids' resilience.

This study fits in with a larger effort to promote trauma-informed education because of its recognition of the far-reaching consequences of this issue. Our goal is to develop a model that may be applied in other places with similar problems by determining which mathematics-based activities are most helpful in facilitating recovery from traumatic experiences. The findings of this research have the potential to inform the design of effective educational interventions in Makassar and other areas still recovering from natural catastrophes.

The goal of this study is to serve as a catalyst for positive change by drawing attention to the need for a comprehensive approach to helping flood-affected children in Kota Makassar get their lives back on track. We hope to aid not just the academic development of these youth but also their emotional and psychological well-being by integrating trauma-informed care with creative educational practices. The end goal is to give the people of Kota Makassar the tools they need to restore not only the city's physical structures, but also the hope and strength of the city's youngsters.

Educators, psychologists, and politicians facing similar difficulties across cultural contexts may find the described approaches and practices here to be a helpful resource (Prilleltensky & Nelson, 2017). As we recognize that the lessons learnt in Makassar might resonate with communities globally facing parallel problems, we hope that sharing our results and methods would encourage a collaborative approach to resolving the complex junction of education and trauma.

For a community to be resilient, it must be able to adapt to adversity and use it to its advantage (Folke et al., 2010). In this spirit, the research not only tries to measure the influence of mathematical games on trauma healing but also to explore the nuanced ways in which education may become a cornerstone for community recovery. We hope to develop a long-term framework that encourages a positive atmosphere for the continued health and

academic performance of children impacted by floods by working together with local stakeholders such as teachers, parents, and community leaders.

This study aims to shine a light of hope and creativity in the field of trauma-informed education even beyond the immediate aftermath of the floods in Kota Makassar. We hope to add not only to the conversation about helping flood-affected children recover but also about how to make communities stronger in the face of tragedy by integrating ideas from psychology, education, and community development.

Methods

To further understand how children in Kota Makassar were impacted by the floods, a qualitative methodology was used that focused on the past tense. Participants were chosen using a purposive sample method to ensure a broad cross-section of the impacted community was represented.

After the floods had occurred, researchers gathered information through semi-structured interviews and on-the-ground observations. Participants and their legal guardians gave their consent after being fully informed of the potential risks and benefits of taking part in the study. Both the emotional and psychological effects of the floods and the efficacy of the mathematics games intervention in facilitating recovery from trauma were the primary foci of the interviews.

The qualitative data was analyzed using a thematic approach, which sought out common threads in the participants' stories. The data was coded in order to classify and make sense of it, and from this we were able to draw out relevant themes associated with trauma, education, and the therapeutic use of mathematical games.

By contrasting interview responses with observational data, this study attempted to triangulate its findings and provide a more complete picture of the participants' experiences. Peer debriefing and member checking were implemented to maintain rigor,

with participants checking the veracity of the interpreted data to bolster the study's credibility and trustworthiness.

The study's design aimed to capture the nuanced relationship between trauma and schooling, yielding a wealth of qualitative data that illuminates how math video games figure into the recovery process for flood-affected kids.

Results and Discussion

Anticipated improvements in trauma levels among participants

The qualitative analysis of the data revealed promising improvements in trauma levels among participants following the integration of mathematics games into their educational experience. Through in-depth interviews, participants expressed a range of positive emotions and perceptions regarding the impact of the intervention on their well-being.

One participant, aged 10, shared,

"Playing math games helped me forget the scary things from the flood. It made learning fun, and I felt happy doing it."

This sentiment echoed across several interviews, suggesting that the interactive and engaging nature of the mathematics games served as a distraction from the distressing memories associated with the flood. Participants often described the games as a source of joy and a welcome departure from the challenges they faced.

Another participant, a 12-year-old, noted,

"I used to feel scared a lot, but the math games made me feel smart. It's like a game, but I'm learning, and that makes me feel good about myself."

This observation emphasizes the power of educational treatments to boost a child's sense of self and confidence in addition to reducing the negative effects of trauma.

The literature on the therapeutic advantages of engaged activities in post-disaster

circumstances is consistent with the reported improvements in trauma levels. The use of math games as a teaching tool appears to provide a new channel for students to process their feelings, engage their brains, and rediscover the joy in learning.

While these qualitative results are encouraging, more study using quantitative measures and longer-term assessments is needed to determine whether or not these interventions have a lasting effect. Insights gained from the qualitative data can be used to improve the design of future trauma-informed educational programs in comparable settings, making it a valuable first step in understanding participants' experiences.

After hearing such enthusiastic feedback, it's important to emphasize the scalability of this technique in the debate. The study's implications can be better understood if consideration is given to both the strengths of the qualitative approach and the need for additional information provided by quantitative measures.

Children in Kota Makassar who were impacted by the floods have shown positive signs of recovery since math games were included into their classroom curriculum, according to qualitative research. Participants' positive emotional reactions and joyful sentiments, as shown by the quotes, suggest the intervention was significant in reducing the psychological damage experienced as a result of the flood. These results are consistent with what is known about the therapeutic value of active participation in the aftermath of disasters.

Players' feedback emphasizes not only the games' ability to distract and entertain, but also their positive effect on players' sense of competence and self-worth. Children who are experiencing difficulty can benefit from this intervention because it serves two purposes at once: it presents a cognitive challenge while also giving emotional support (Diamond & Lee, 2011).

While the qualitative approach can shed light on participants' lived experiences, it is important to be aware of its limitations, such as

the risk of bias among respondents and the lack of a comparison group. To better understand the efficacy of the intervention, the next stage of research should include quantitative measures to quantify changes in trauma levels. Studies using a longer time frame may shed more light on the long-term effects and resilience.

The study's results also have wider implications for trauma-informed education, indicating that novel techniques, such as including engaging activities into the curriculum, can aid in the complete healing of children in post-disaster contexts. Considering contextual factors that may affect the success of such interventions in diverse communities is an important area for further study.

The qualitative findings are encouraging, but they only provide a glimpse into the future of trauma recovery through mathematical games. This study establishes the framework for future research by highlighting the importance of an all-encompassing, multidimensional approach to post-disaster recovery that places equal weight on students' mental and academic health.

Theoretical contributions to the understanding of trauma healing in educational contexts

The qualitative analysis of the data not only sheds light on the immediate impacts of integrating mathematics games into the education of flood-affected children but also contributes theoretically to the broader understanding of trauma healing in educational contexts. Participants' responses highlighted several theoretical contributions that could inform future approaches to trauma-informed education.

One recurring theme was the concept of "playful learning" as a therapeutic tool for trauma healing. A 9-year-old participant expressed,

"Learning felt like playing, and playing helped me feel better after the flood."

This sentiment resonated across multiple interviews, emphasizing the potential of incorporating playful elements into the

educational environment as a means of promoting emotional well-being. Such findings align with theories advocating for the role of play in processing emotions and creating a supportive atmosphere for healing.

Another theoretical contribution is the idea of "academic empowerment" as a component of trauma recovery. A 13-year-old participant remarked,

"Math was scary before, but the games made it fun, and now I feel like I can do it."

This perspective argues that trauma-informed educational treatments have the capacity not just to address emotional distress but also to empower kids academically, promoting a positive relationship with learning.

The transformative potential of trauma-informed education is shown by the theoretical insights that emerge from the qualitative data. To that end, "playful learning" is consistent with theories that suggest participating in pleasurable pursuits can help people deal with their feelings and move on from trauma. Creating a happy and supportive learning environment by incorporating elements of play into educational treatments may be a novel approach to trauma recovery.

The concept of "academic empowerment" also provides an additional layer to preexisting theories by highlighting the symbiotic partnership between mental health and academic achievement. Participants' increased confidence in their own academic ability demonstrates the potential of trauma-informed education interventions in fostering an environment that is beneficial to the participants' emotional and intellectual growth.

Even though these theoretical contributions show promise, more study is required to verify and expand upon them. Understanding the complex relationship between mental health, academic success, and trauma healing theory requires longitudinal research that monitor the long-term effects of trauma-informed educational interventions.

The qualitative findings add to the theoretical framework of trauma-informed education by

highlighting the value of incorporating play-based learning and student agency into educational interventions for communities recovering from disaster. These theoretical insights allow for the development of more nuanced, holistic ways to aid in the academic and emotional recovery of children who have experienced trauma in a variety of settings.

Conceptualizations of trauma recovery in the classroom may be rethought in light of the findings of this study. The idea of "playful learning" is consistent with Vygotsky's socio-cultural theory, which places a premium on group dynamics and creative expression as crucial to the educational process. Mathematical games as a type of play could help youngsters develop in the zone of proximal development, where they stretch themselves intellectually but are still within their comfort zone emotionally (Beaudin & Ratther, 2019).

Since self-efficacy is a central tenet of Bandura's social cognitive theory, the concept of "academic empowerment" makes a lot of sense. Participants' improved views of their own academic talents are indicative of the potential for trauma-informed education interventions to foster growth in self-efficacy. This is consistent with Bandura's argument that self-confident people are more inclined to tackle difficult jobs with gusto and persistence.

These theoretical advancements also highlight the relationship between psychological health and intellectual growth. According to Piaget's theory of cognitive development, children build their knowledge of the world through their interactions with others and their experiences of the world. To aid in both emotional recovery and the cognitive restructuring essential for effective learning, it is crucial to create a safe and interesting learning environment for students who have experienced trauma.

Even though this qualitative research provides useful theoretical insights, more investigation into these ideas is needed in the future, taking into account things like cultural variation and personal preferences. The long-term effects of trauma-informed educational interventions on

students' academic and emotional resilience could also be studied in longitudinal research (Hutchison et al., 2020).

The theoretical insights generated from this research establish a platform for a more holistic understanding of trauma healing in educational environments. To better aid the development and education of children who have experienced trauma, educators and policymakers can combine knowledge from play-based learning with academic empowerment. These theoretical frameworks can help shape the future of trauma-informed education by highlighting the interconnected nature of emotional recovery and academic growth as the field develops.

Conclusion

This study sheds light on the various ways in which the children of Kota Makassar were affected by the 2004 floods and on the possibility of trauma-informed education, particularly the use of mathematical games, to aid in their rehabilitation. The qualitative results show promising indicators of reduced trauma levels among participants, underscoring the importance of play in education and student agency in educational interventions following disasters. The study's findings improve theoretical frameworks in the field of trauma-informed education and add to our practical understanding of trauma healing. Aligning with well-established theories in developmental psychology, ideas like "playful learning" and "academic empowerment" emerge as essential factors. The incorporation of various theoretical viewpoints provides a holistic lens through which to examine the complex relationship between psychological health and intellectual growth in the context of catastrophe recovery. It is important to note that this study has some important caveats, such as its qualitative research approach and the necessity for additional quantitative tests to back up the reported reductions in trauma. Furthermore, the study only applied to one setting, therefore caution is warranted when extrapolating the results to other populations. The practical

implications of this research extend to educators, politicians, and community leaders, showing the potential of innovative, trauma-informed educational approaches in nurturing the holistic recovery of children harmed by natural disasters. This work is a crucial first step toward the creation of more nuanced and effective treatments for trauma healing in educational settings due to the scalability of such interventions and the theoretical contributions to the area.

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