

SNAKES AND LADDERS GAME AS A SOLUTION TO REDUCE STRESS BY PARENTING STYLE AS A MEDIATION IN MATHEMATICS SUBJECTS**Wilda Fasim Hasibuan^{1*}, Fitri Qoriaturrosyidah², Putri Annisa Alwahab³, Nur Fitri Ananda⁴, Yudhi Hanggara⁵**¹Program Studi Pendidikan Bimbingan Konseling, Universitas Riau Kepulauan^{2,3,4,5}Pendidikan Matematika, Universitas Riau Kepulauane-mail: wida@kip.unrika.ac.id**ABSTRACT**

Stress in everyday life is normal, but it becomes extraordinary when it occurs during adolescence. There are numerous stressors for adolescents, including academic success in mathematics. Consequently, the purpose of this study is to provide education on snakes and ladders as a means of reducing stress tendencies by mediating mathematics parenting. Before receiving the ladder snake educational treatment, there was no difference in stress tendencies ($p < 0.152$). Then, regardless of their parenting style, the level of student tension is the same. The inference is that lowering stress tendencies in adolescents cannot be achieved by concentrating on a single causal factor; rather, it is required to look for additional elements that broadly impact stress.

Keywords :*stress, adolescent, snake and ladder game, parenting, mathematic***ABSTRAK**

Stres dalam kehidupan sehari-hari merupakan hal yang wajar, namun menjadi luar biasa bila terjadi pada masa remaja. Ada banyak pemicu stres bagi remaja, termasuk keberhasilan akademis dalam matematika. Oleh karena itu, tujuan penelitian ini adalah untuk memberikan edukasi tentang ular tangga sebagai cara untuk mengurangi kecenderungan stres dengan memediasi pola asuh matematika. Sebelum mendapat perlakuan edukasi ular tangga, tidak terdapat perbedaan kecenderungan stres ($p < 0,152$). Lalu, terlepas dari gaya pengasuhan mereka, tingkat ketegangan siswa tetap sama. Kesimpulannya, penurunan kecenderungan stres pada remaja tidak dapat dicapai dengan hanya memusatkan perhatian pada satu faktor penyebab saja; sebaliknya, kita perlu mencari elemen tambahan yang berdampak luas pada stres.

Kata kunci :

stres, remaja, permainan ular tangga, pola asuh, matematika

PENDAHULUAN

The period of development known as adolescence is associated with many issues which cause stress. In one study, approximately 50% of children and adolescents had developmental stage-related issues. Moreover, it causes great stress and heightens adolescents' sensitivity, which causes social stress. Some mature in months, while others become psychopathological during their growth phase. (Murberg & Bru, 2007; Scheuplein & van Harmelen, 2022)

Some texts establish a connection between stress and mental health. The

pressure to achieve high grades in school, particularly in mathematics classes, is one of the factors contributing to adolescent stress. Inseparable from the societal paradigm that mathematics proficiency is the highest academic accomplishment is parental pressure to excel in certain subjects. The pattern of parental connection and communication causes significant tension for adolescents. (Fu et al., 2022).

It was discovered that 6,7% of grade 7 dropouts in rural China were the result of academic stress and negative school rumor, affecting 4,596 students in 38 schools, with

the dropout effect being a factor. Students who drop out of school frequently experience social problems, including a sense of isolation in class, academic stress and exhaustion, and suicidal ideation. (Gao et al., 2019).

Adolescents who must maintain their grades in a number of crucial areas, such as mathematics, or who worry that taking particular tests, such as mathematics, may bring stress and academic strain, are other sources of stress. Concerned about their arithmetic performance, perplexed by the amount of math work required, and worn out from having to study a lot of math content (Wulandari & Theis, 2012).

According to other research, the lowered effectiveness of learning mathematics by compressing it into five days has a substantial effect. According to other research on the growth of arithmetic learning, math learning variations sometimes involve doing assignments and questions monotonously. Students can simultaneously explore colors, visuals, sound movements, music, and stories through interactive learning media, making learning enjoyable. Students' stress levels toward arithmetic classes will reduce if learning is enjoyable (Anifah, 2016; Lucy Hariadi, 2022).

It's no secret that mathematics is a challenging and horrible topic, therefore learning it is boring and strict. However, since the early 2000s, perception has changed among math teachers, leading to the revival of media and teaching methods for arithmetic. According to earlier studies, SMP students in Class VIII can develop mathematical reasoning skills using problem-based learning methodologies. Class actions with two cycles were used in this study. Since there was a 9% rise from the first to the second cycle, the problem-based learning discussion approach helps students' reasoning ability. (Prayoga, 2018). Nevertheless, in many schools, mathematics has not become an enjoyable subject to learn

since it is not supported by learning strategies that are appropriate to the learning outcomes and also the developmental phases of students, resulting in a stigma that mathematics is difficult to learn.

Other studies support the need for learning media in the form of mathematical comics because, according to this study, 83.33% of participants find comics entertaining and because mathematical concepts like geometric shapes are difficult to conceptualize in the abstract without the aid of suitable learning media. A related study found that using wooden house media really helped students comprehend the concept of geometric shapes in junior high school students. Students' understanding of geometric shapes increased gradually rather than significantly, from an initial increase of 2.6% to increases of 38.5%, 5%, and then 87.2%. (Erni et al., 2018; Zikri, 2018)

Before conducting this study, observations and brief interviews with students about their experiences learning mathematics provided information that grade 8 students were still being taught using traditional methods and that mathematics teachers had no effective strategies to increase their understanding. The stress scale, taken from a reliable source and evaluated, is likewise distributed as the primary data. According to the results of this scale, stress levels in grades 8 and 9 at SMPIT 'X' Batam City tend to range between 35 and 40 percent. The stress was found to be brought on by the academic goals that the teenager had to achieve and the parental expectations that students adhere to a certain standard after carefully evaluating the interviewing methodology. These female students reacted to their stress by engaging in negative, targeted coping mechanisms like wanting to harm themselves, trying to slice their arms, and starving themselves for days. Twelve kids from the two classrooms that received the snakes and ladders education treatment were

chosen, based on the stress scale findings, which were 58-72%. Despite being invited to participate from the first treatment to the last, only 10 of the 12 selected students remained committed to taking part in the instructional snake ladder treatment the entire time.

In this research, parenting style itself was considered a stress mediator, because according to the findings of interviews, parents' expectations that their children achieve the highest possible score on mathematics subject exams create stress in mathematics classes. Several sources indicate that parenting practices influence several aspects of children's lives, including behavior, tension, and anxiety. According to one study, authoritarian parenting adversely affects children, including depression and anxiety, withdrawal from social activities, and adolescent substance abuse.(Dalimonte-Merckling & Williams, 2020; Zhang et al., 2022). Therefore, in this study, parenting was included as a mediator variable, which was ostensibly a stress trigger factor in adolescents; the objective was to determine if the tendency to experience stress during mathematics lessons resulted from parental pressure, which ostensibly stemmed from one of the parenting models.

According to more studies, authoritative parenting reflects tenderness and affection directly proportional to parental authority. And this is what children require from a young age until they reach adolescence, whereas many authoritarian parental styles are undesirable, according to European-wide research. In the meantime, a permissive European nation still desires this parental approach, but it has more negative consequences. However, combining permissive and authoritarian parenting with authoritative parenting will add positive value (Lavrič & Naterer, 2020). Nevertheless, according to other studies, authoritarian parenting or parenting styles that are more focused on punishing children

when they make mistakes tend to increase behaviour problems, and children of parents who are insensitive to their child's emotional issues, i.e., who practice authoritarian parenting, find it more difficult to express their emotions despite being in a state of stress and needing the assistance of others. (Luo et al., 2020).

The inability of a person to adapt to a certain situation is referred to as stress. Stress is not brought on by a single factor but rather by combining several variables. Research shows that adolescent anxiety can be attributed to academic success or school rank. According to one study, adolescents' school grades account for 7% of the stressors that they experience(Bester, 2019). Adolescents spend most of their time at school or elsewhere; this is where they often connect with friends and teachers and demonstrate their personalities. Teenagers also grow in their abilities, interests, and personal development. However, the adolescent stage is seen as a difficult and inevitable time. However, teenagers' ability to deal with speed, quality, and change is compromised, and the phenomena of adolescent stress are now recognized (Byrne et al., 2007; Carvalho & Novo, 2014). Additionally, negative adolescent behaviors, including yelling, rejecting others, and avoiding conflict, are common among those who engage in emotion-focused coping. (Staiger et al., 2009). A different approach is problem-focused coping, which looks for information on how to address issues head-on. (Kural & Kovacs, 2021). Problem-focused coping involves changing oneself or one's environment to feel more at ease(Meyerson et al., 2022). In SMPIT 'X,' adolescents select self-harming stress management strategies, such as arm-slashing attempts, yelling, and overeating. adolescents, particularly those who spent more time at school than at home, frequently struggle with the perception that no one else understands them.

Adolescents are considered independent individuals because they handle almost all of their affairs. Teenagers also know that if they study optimally at school, obtaining employment and continuing their education will be easier. Teenagers socialize and influence one another with their classmates at school. In one study, the school had a significant impact if there was dysfunction in the family, particularly substance abuse (McCoy et al., 2020).

The relationship between parents and adolescents changes as adolescents become more independent, requiring parents to adapt their relationship and be able to view their children as adults with relationships more similar to those with friends as opposed to children who must obey their parents' commands. The meaning of independence in adolescents is demonstrated by their daily activities, such as spending less time with their parents, not being too close to them, rebelling more against their parent's wishes, and having their style, preferred cuisines, and a strong desire to be free (not constrained). (Kail & Cavanaugh, 2019).

This study stands out from prior studies because it includes parenting style mediator variables to examine whether or not the parenting style children receive influences their stress tendencies. In previous research on stress and mathematics lessons, only solutions or more appropriate learning strategies were pursued to reduce stress. In this study, mathematics was not taught formally during class; rather, students were invited to play and given material. Students conducted this research for students to ensure it came across as something other than superior and instructive, but rather as a peer-to-peer interaction loaded with mathematical material. In other words, the purpose of this study has to determine whether playing snakes and ladders decreases students' stress tendencies and how the parenting style students receive influences their stress tendencies.

METHOD

This research methodology is a pre-post-one sample design with a pre-experimental methodology. It is known as the pre-experiment because the experimental and control groups were not compared in this study. This investigation employed a single experimental group of 10 female students. Purposive sampling was used because the samples were selected based on multiple criteria: the results of the stress scale indicated moderate to high-stress levels. They were based on observations and interviews with previous counselling teachers. This study adopts the research-validated DASS scale (depression, anxiety, stress scale 21) and the parenting scale is also the consequence of adoption, its validity and reliability have been tested (Anjar & Satiningsih, 2013; Arjanto, 2022; Diah & Kusrohmaniah, 2022)

This study was conducted in one of the Integrated Islamic-based schools in Batam City, using a curriculum comprised of the 2013 curriculum, additional Islamic religious education content, and a program for Koran memorization. Ten female students who had previously received a stress instrument pre-test and were deemed prone to stress participated in the study.

Wilcoxon's non-parametric statistical analysis was used for the initial data analysis because the sample consisted of only ten female students, increasing the likelihood of anomalous data. The Wilcoxon test aimed to determine whether there was a difference in stress levels before and after receiving serpent ladder education. For the second analysis, Mann-Whitney U was utilized. This analysis determined whether parental style mediator variables affect student stress. This investigation used snakes and ladders to teach three fundamental mathematical concepts: algebra, geometric shapes, and exponential numbers. Due to the findings of interviews with students with moderate to high-stress levels, one of the

mandates from parents and the school is for students to achieve high math scores.

RESULTS AND DISCUSSION

This study collected responses from ten female students. Integrated Islamic Junior High School "X" is a research collaborator with a class separation policy between students and students. Thus, this study's sample consisted entirely of females.

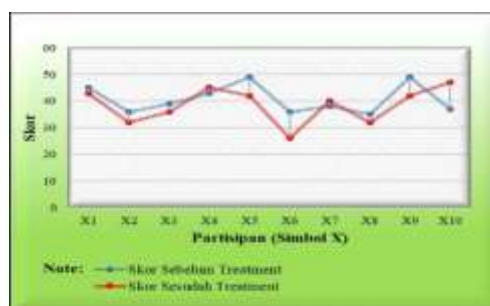
According to $p < 0.152$, the analysis of the data showed that the snake and ladder game therapy had no effect on reducing student stress. Since the outcomes of parenting as a mediator are $p < 0.114$, there is no difference in stress according to the parenting style that students experience. The findings of the study are as follows:

Table 1. Analysis data

Scale	N	Mean Rank	Wilcoxon	Mann-Whitney U
Stress	10		0.152	
Authoritarian parenting style	6	6.83		0.114
Authoritative parenting style	4	3.5		0.114

Table 2. Score of DASS's Scale before and after treatment

Partisipan	Stress before Treatment	Stress after Treatment
X1	45	43
X2	36	32
X3	39	36
X4	43	45
X5	49	42
X6	36	26
X7	38	40
X8	35	32
X9	49	42
X10	37	47



Picture 1. Line diagram result

Following reviewing the hypothesis arguing that there has been no effect of reducing stress tendencies in students before and after being given the Snakes and ladders game, a temporary conclusion could be drawn based on the above diagram. The

almost identical appearance of the score on the blue line after treatment and the red line before treatment suggests that mathematics lessons accomplish not entirely influence student stress. Prior to data analysis, the DASS scale was administered before and after the treatment; the data were highly

variable, and the scores of seven out of ten pupils decreased before and after receiving the treatment. Three students' tension levels increased after receiving the snakes and ladders educational treatment.

According to statistical data analysis, there is no difference in average stress levels between the pre-test and post-test, and the educational media Snakes and Ladders cannot reduce students' stress levels. Then, based on the aforementioned data, it was determined that six students received authoritarian parenting and four individuals received democratic parenting. It can be concluded that there is no difference in student tension based on parental style, it can be concluded. This educational application of snakes and ladders can only be effective if students can answer math queries on cards that have been matched during the game's stages.



Picture 2. snake and ladders game

As demonstrated in the image, students can continue playing the game if they can solve challenging arithmetic problems. This game is immensely engaging for female students. However, the effect of online learning during Covid-19 has resulted in students needing to fully comprehend the fundamental concepts of techniques for solving math problems in the three implemented components, namely algebra, geometric shapes, and exponential numbers. According to one study, online learning during the Covid-19 period was influenced by several factors, including (a) subjective norms within the individual, (b) the intention of learning, and (c) behavioural control

exercised by subjects during online learning (Sarosa, 2022).

In another large-scale study conducted by Unicef in 20 developing countries, it was determined that online learning during Covid-19 closely correlated with the reading and arithmetic skills that students should possess. Where online education depends on family income and socioeconomic status, this study revealed that thirty per cent of pupils worldwide were not connected to the internet during a pandemic in which all learning in schools was managed online. According to the same study, students' exclusion from online learning with a focus led to a decline in their fundamental reading and math skills. This study confirms the findings of previous studies indicating that learning mathematics is more engaging and straightforward when diversions and a non-stressful environment are employed. In addition, the addition of parents as a mediator variable on the stress of learning mathematics has not yielded similar research (Alban Conto et al., 2021)

Ten students who received Snakes and Ladders education needed to comprehend the foundations of algebra, geometric shapes, and exponential numbers. These students' online learning in seventh and eighth grade caused them to need more understanding. When the foundations of the three materials were reviewed and explained, students listened attentively and progressively grasped the three concepts. Nevertheless, female pupils were more motivated to complete the educational game Snakes and Ladders stages than to solve math problems. In the observations and discussions conducted, ten students stated that they felt frustrated, indolent, disinterested, and bored when they encountered question cards in the educational game Snakes and Ladders and could not answer them.

However, their focus on this game is a strong desire to solve problems, so the three

mathematical learning components added to this treatment are attempted with considerable difficulty. Notable is that geometric shapes and exponential numbers cannot be identified as the primary focus of the student's attention between the desire to complete the stages of the snake and ladder game and comprehending the fundamental concepts of algebra.

Meanwhile, there was no difference in tension between the parenting styles of the ten students whose coping strategies influenced their styles. In an interview, it was stated that the pupils lacked the courage to confront their parents because their lives were still in the hands of others. A study on adolescent stress found that adolescents would employ emotional avoidance and conflict diversion as coping mechanisms. According to another study, adolescents frequently choose emotion-based stress coping strategies. Furthermore, adolescents frequently feel confused, get furious for no apparent reason, do not want to do anything, and do not want to speak to anyone (Howell et al., 2015; Singh et al., 2021).

Thus pupils who receive authoritarian and authoritative parenting yet themselves feel stressed are unable to argue with their parents about the requirements to become high-achieving students. Several students stated that attending an integrated Islamic school was not their preference because the curriculum was too challenging, and they had a limited opportunity to develop themselves due to the school's full-day schedule. Parents always demand that their children observe all school rules and lessons to succeed, regardless of whether they can do so.

In the meantime, the disconnect between snakes and ladders education and stress reduction for female students was caused by several factors, including the fact that, initially, the DASS instrument was not accompanied by individual interviews regarding specific matters that stressed the

students, resulting in general pretest results with moderate to high-stress levels. Three students did not experience decreased tension levels after receiving the snakes and ladders educational treatment; in fact, the opposite was true for these students. One student experienced a significant increase in tension levels, while the other two students experienced gradual increases. Another reason is that no in-depth interviews were conducted to determine which subjects placed these students under particular stress. Even though mathematics is mentioned as a disliked subject, the causes of tension in this subject should be investigated in depth.

CONCLUSION

According to the preceding description, it can be concluded that SMPIT 'X' Batam City, Riau Kepulauan, did not implement a snake-and-ladder educational treatment to reduce student stress. This study found no difference in stress levels between students with authoritarian and permissive parental styles. For future research, interview and observation techniques should be added to data collection so that the collected data is more diverse and can be analyzed in greater detail. It is recommended that future research investigate whether students' distaste for mathematics is due to the teacher's method of instruction or to other factors. Since they are still in the conventional learning stage, students believe they only embrace what is taught in lectures without needing to seek out sources or use other learning strategies.

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