

THE IMPACT OF PROVIDING APPRECIATION STARS “DIARY OF MY BONE” ON CHILDREN’S EMOTIONAL WELL-BEING IN MALANG REGENCY VILLAGE

1st Mochamad Saiful Anwar¹
2nd Herdyana Lintang Sari²

¹Universitas Brawijaya (Ilmu Keperawatan,
Kota Malang, Jawa Timur, Indonesia)

* email: mochamadsaiful@student.ub.ac.id

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Abstract

Children’s mental health is essential for their emotional, social, and academic development. Anxiety and other mental disorders can hinder a child’s future, making early intervention crucial. Diary of My Bone is a companion journal designed for children aged 7-11, structured according to Erik Erikson’s developmental stages. It introduces kyphosis through simple explanations and illustrations while providing guidance on brace care. The journal encourages children to track daily activities, emotions, food intake, and brace usage, with star stickers as motivation. This study examines the impact of Diary of My Bone on children’s moods using a pre-test and post-test experimental design without a control group. The research was conducted in Sumber Sekar Village, Malang Regency, with a minimum of 10 children meeting inclusion criteria. Mood assessments were conducted before and after a four-week intervention, and data were analyzed using a paired t-test. Results show that the use of Diary of My Bone significantly improved children’s moods, enhancing their social interactions, confidence, and overall happiness. The star sticker reward system effectively motivated children to complete their daily tasks, fostering emotional resilience and self-discipline. These findings highlight the potential of appreciation-based interventions in nursing practices to support children’s psychological well-being. Integrating simple reward-based strategies into pediatric healthcare can enhance children’s motivation, emotional expression, and adherence to health routines, offering a cost-effective approach to long-term health monitoring and development.

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INTRODUCTION

Kyphosis is a spinal disorder characterised by an abnormal forward curvature, primarily in the upper back. The most common types include postural kyphosis, Scheuermann’s kyphosis, and congenital kyphosis. If left untreated, this condition can progress into severe deformities with complications such as respiratory issues due to lung compression, chronic back pain, an increased risk of paralysis from progressive neurological deficits, and cardiovascular problems. Research by OZRUDI and AMIRI (2021), highlights that children with kyphosis frequently experience psychosocial stress due to social stigma and peer exclusion, especially in school environments, which restricts their emotional growth and

social engagement. In children, kyphosis not only causes physical discomfort but also significantly affects their emotional and psychological well-being. Children with kyphosis often struggle with body image issues, leading to low self-esteem, anxiety, and even depression. Research by OZRUDI and AMIRI (2021). Globally, the prevalence of kyphosis in children and adolescents is estimated between 1% and 8%, with postural kyphosis being the most commonly observed form in early adolescence (Kado et al., 2013; Maekawa, 2022). In Indonesia, although specific national prevalence data are scarce, increasing trends in poor posture and spine-related complaints have been linked to sedentary habits and prolonged gadget use among school-aged children (Isnayanti et al., 2024). This underscores

the urgency of early detection and psychosocial support to prevent long-term complications and emotional distress in affected children, which limits their social interactions. These challenges not only affect their self-perception but also interfere with daily activities such as playing, learning, and participating in social engagements (Soliman, 2018; Dima et al., 2022). The long-term impact of kyphosis extends beyond childhood, affecting future independence and increasing reliance on family support, which can create emotional strain on both the child and caregivers (Pan, 2023; Woods et al., 2020).

Social stigma, as noted by Babae et al. (2022), further hinders the psychosocial development of children with kyphosis, as peer exclusion exacerbates feelings of isolation. Addressing these psychological challenges requires an interactive and structured approach that educates children about their condition and provides emotional support. Various therapeutic interventions have been introduced to assist children in managing kyphosis, including PosturCare, a back support system designed to correct spinal deviations and stabilise posture using a body corrector. This device also alleviates pain through hydrostatic pressure and thermotherapy, which help reduce inflammation (Ogura et al., 2021). Additionally, educational tools such as Diary of My Bone provide structured guidance for children aged 7-11 by helping them understand kyphosis while tracking their daily activities, including brace usage. This journal incorporates a reward system with star stickers and achievement certificates to encourage children to maintain spinal health in a fun and engaging way.

The effectiveness of appreciation-based motivation can be understood through Maslow's hierarchy of needs, which suggests that humans must fulfil five levels of needs sequentially, starting from physiological needs to self-actualisation (Acevedo A, 2018). In this study, Maslow's concept is particularly relevant, as the star reward system functions as an external motivator that fosters children's psychological development, especially in aspects related to self-esteem and social acceptance (Ryan & Deci, 2000). Pratiwi (2021) found that recognition of children's achievements plays a crucial role in building confidence and reducing anxiety, aligning with the esteem needs in Maslow's hierarchy.

Additionally, research by Babae et al. (2022) highlights that reward-based interventions can significantly improve the quality of life for children with medical conditions like kyphosis by enhancing motivation and social acceptance. Programmes such as Diary of My Bone further support the fulfilment of social needs within Maslow's framework, as they provide children with a sense of recognition and belonging. These findings align with research by Bastrom et al. (2024), which emphasises the role of social recognition in children's psychosocial development. Therefore, integrating Maslow's theory into this study suggests that appreciation-based interventions can positively impact the emotional well-being of children with kyphosis by gradually fulfilling their psychological needs.

Mental health concerns related to kyphosis, particularly among children in Malang Regency, have become a pressing issue due to their impact on psychosocial development and overall independence. Studies have shown that educational interventions such as Diary of My Bone can enhance children's moods while acting as both a monitoring and motivational tool throughout their treatment journey (Manoj, 2021). Previous research also indicates that community-based support programmes significantly increase children's engagement in healthcare, reduce anxiety levels, and improve their overall quality of life (Bastrom et al., 2024; Rice et al., 2024). In this regard, healthcare professionals, especially nurses, play a vital role in promoting spinal health and psychological well-being through a holistic self-management approach (Heredia-Rizo et al., 2024).

Given these factors, this study aims to offer an innovative solution for maintaining children's physical and emotional stability through a structured, engaging, and motivational educational approach. By integrating psychological support into kyphosis management, this study seeks to answer the following research question: How does the use of Diary of My Bone impact children's moods? The objective is to assess the effectiveness of this intervention in improving children's emotional well-being and fostering a supportive, engaging healthcare experience.

METHODS

Participant Selection

The participants in this study were children aged 7–12 years living in Sumber Sekar Village, Malang Regency, selected using purposive sampling. This location was chosen due to its high number of school-aged children identified with poor posture and early-stage kyphosis based on preliminary community health assessments conducted by local health posts. Additionally, the area had an established partnership with the research team, which facilitated participant recruitment and monitoring.

Based on data from the community health center, there were approximately 35 children in the target age range within the village who potentially met the study criteria. From this population, a total of 12 children who fulfilled the inclusion criteria were selected as research participants. These criteria included being physically and mentally healthy, not having any underlying conditions that could hinder participation, and obtaining parental or guardian consent as part of ethical approval. Children who did not meet these criteria or who had conditions that interfered with their ability to engage consistently in the intervention were excluded from the study.

Research Instruments

This study utilized two primary research instruments: the Mood Scale questionnaire and Diary of My Bone, both of which played a crucial role in assessing children's emotional well-being and tracking their engagement in health-related behaviors. These instruments were chosen to ensure a comprehensive evaluation of the intervention's effectiveness in improving children's mood and encouraging positive habits.

The Mood Scale questionnaire was used to measure changes in children's emotional states before and after the intervention. The Mood Scale questionnaire was used to measure changes in children's emotional states before and after the intervention. This questionnaire was adapted from existing pediatric mood assessment tools and modified to suit children aged 7–12 years. To ensure its appropriateness and psychometric soundness, the

questionnaire underwent a validation process prior to implementation.

Content validity was assessed through expert judgment involving three pediatric psychologists and one child health nurse. Each item was evaluated for relevance, clarity, and age-appropriateness. The results showed a Content Validity Index (CVI) of 0.89, indicating strong agreement among experts. To test construct validity, exploratory factor analysis (EFA) was conducted on a pilot group of 20 children with similar demographics. The analysis supported a unidimensional structure aligning with key emotional domains (happiness, anxiety, motivation, and emotional stability), with factor loadings ranging from 0.61 to 0.78.

Reliability testing was performed using Cronbach's alpha, which yielded a value of 0.84, indicating good internal consistency. Additionally, a test-retest reliability check over a 10-day interval resulted in a correlation coefficient (r) of 0.81, confirming stability over time. The questionnaire also incorporated emoji-based visual aids to help young children express their emotions accurately, improving engagement and comprehension. The final version included 10 items, each scored using a 5-point Likert scale ranging from "very negative" to "very positive."

This tool consisted of structured questions designed to assess various mood indicators, including levels of happiness, anxiety, motivation, and emotional stability. The questionnaire used a Likert-scale format, where children rated their feelings on a scale ranging from very negative to very positive. To ensure that children could easily understand and respond accurately, the questionnaire incorporated simple language and visual representations, such as emoji-based mood indicators, which made it more engaging and accessible for young participants. The pre-test questionnaire was administered before the intervention to establish a baseline mood score, while the post-test questionnaire was given after four weeks of using Diary of My Bone to evaluate any significant improvements in mood and emotional well-being.

The second instrument, Diary of My Bone, served as both an intervention tool and a data collection method. Designed

specifically for children with kyphosis, this interactive journal guided them in documenting their daily activities, emotions, nutritional intake, and compliance with brace usage. The journal was structured with engaging visual elements, including colorful illustrations and activity prompts, to maintain children's interest and encourage consistent use. Each daily entry included sections where children could record their morning and evening moods, write about notable daily events, and reflect on their overall emotional state. Additionally, there were specific sections dedicated to tracking brace usage, ensuring that children documented whether they wore their brace as recommended and whether they experienced any discomfort.

A significant feature of Diary of My Bone was the motivational reward system, which played a crucial role in reinforcing positive behavior. Each time a child successfully completed their daily journal entry and adhered to their health routines, they were awarded a star sticker as recognition of their effort. The accumulation of these stickers over time created a sense of achievement, motivating children to stay engaged in the process. At the end of the intervention, children who demonstrated high consistency in journaling and maintaining healthy habits were also awarded a certificate of achievement, further enhancing their motivation and sense of accomplishment.

Throughout the study, researchers provided regular guidance and monitoring to ensure that children understood how to use the diary effectively. Parents were also encouraged to play a supportive role by reminding their children to complete their journal entries and discussing their daily experiences together. This collaborative approach helped maximize the effectiveness of Diary of My Bone, ensuring that it functioned not only as a data collection tool but also as a means of fostering self-awareness, emotional resilience, and long-term behavioral change among the children.

By combining a structured quantitative measurement tool (Mood Scale questionnaire) with an interactive qualitative tracking system (Diary of My Bone), this study ensured a holistic approach to evaluating children's emotional well-being and their engagement in positive health behaviors. The use of these instruments provided both numerical data for statistical

analysis and qualitative insights into the children's personal experiences, offering a well-rounded understanding of the intervention's impact.

Intervention Procedure

The intervention in this study was designed to improve children's emotional well-being by encouraging them to consistently track their daily activities, emotions, and health-related behaviors through Diary of My Bone. This journal served not only as a monitoring tool but also as a motivational approach by incorporating a reward system with star stickers. The intervention lasted for four weeks and involved three key phases: an initial assessment, a structured four-week implementation period, and a final evaluation to measure its effectiveness.

Phase 1: Initial Assessment (Pre-Test Stage)

Before starting the intervention, each child completed a Mood Scale questionnaire to establish a baseline for their emotional state. This pre-test was crucial for comparing the child's mood before and after using Diary of My Bone. During this phase, the researchers also conducted an initial briefing session with the children and their parents to explain the purpose of the study, the importance of maintaining a daily journal, and how the reward system with star stickers would function as motivation. Children were encouraged to express their thoughts, concerns, and expectations regarding their condition, particularly those related to kyphosis and brace usage. This phase helped build rapport between the researchers and participants, ensuring that children felt comfortable and engaged throughout the intervention.

Phase 2: Four-Week Intervention Using Diary of My Bone

During the four-week intervention, children were guided to consistently use Diary of My Bone to document their daily activities, emotional states, nutritional intake, and brace usage while receiving continuous motivation through a reward system. Each day, they recorded their routines, including school-related tasks, physical activities, and social interactions, to increase their awareness of structured daily habits. In addition to tracking their activities, children also described their moods using simple prompts and emoji-based indicators, allowing

them to recognize patterns in their emotions and identify potential triggers such as school stress, social interactions, or discomfort caused by kyphosis.

Since proper nutrition plays a crucial role in bone health, children documented their daily food intake to ensure adequate consumption of calcium and vitamin D while also monitoring their adherence to brace usage by noting any difficulties or discomfort. To encourage consistency, a motivational reward system was applied, where children earned star stickers each time they successfully completed their journal entries and followed their health routines, reinforcing their motivation to maintain positive habits. The accumulation of these stickers served as a visible representation of their progress, and at the end of the intervention, children who consistently recorded their activities and maintained good health behaviors were awarded a certificate of achievement as recognition for their dedication.

Throughout the process, researchers provided continuous support and monitored the children's participation, while parents were encouraged to be actively involved by reminding them to complete their journals and engaging in discussions about their daily experiences, fostering a more interactive and supportive environment for behavior change.

Phase 3: Final Evaluation (Post-Test Stage & Analysis of Outcomes)

At the end of the intervention, children completed the same Mood Scale questionnaire as in the initial phase to evaluate changes in their emotional well-being, with post-test results compared to pre-test scores to determine the effectiveness of Diary of My Bone in improving their mood and overall psychological health. The findings demonstrated a significant improvement, with children reporting a more positive emotional state, reduced anxiety, and increased motivation, which was reflected in their higher post-test mood scores.

Many children, who were initially withdrawn or hesitant to express their feelings, displayed greater confidence and more active social interactions, showing noticeable progress in their ability to communicate and engage with peers and family members. Additionally, compliance with brace usage improved, as the reward system encouraged children to wear

their braces consistently, reducing discomfort and reinforcing better posture habits. Beyond physical health, children also developed a greater awareness of their well-being, recognizing the importance of maintaining healthy routines such as proper nutrition, regular physical activity, and emotional expression. The combination of structured journaling and positive reinforcement proved to be an effective motivational approach, fostering self-discipline, enhancing psychological resilience, and supporting children in managing their condition with a more positive and proactive mindset.

The success of this intervention highlights the effectiveness of simple appreciation-based strategies in motivating children to take an active role in their health management. By integrating structured journaling with positive reinforcement, Diary of My Bone proved to be a valuable tool in enhancing children's psychological well-being, fostering self-discipline, and promoting adherence to spinal health care routines.



Figure 1 Intervention Session



Figure 2 Post Intervention

Data Analysis

The data collected from the pre-test and post-test Mood Scale assessments were analyzed using a paired t-test, a statistical method designed to compare the mean differences in participants' mood scores before and after the intervention. This test was selected because it effectively measures changes within the same group over time, allowing researchers to determine

whether Diary of My Bone had a significant impact on children's emotional well-being. The analysis began with data cleaning and verification to ensure accuracy and completeness, followed by a normality test to confirm whether the data distribution met the assumptions required for paired t-test application.

The overall results demonstrated that Diary of My Bone significantly enhanced children's mood and emotional well-being, with most participants showing notable improvements in their post-test scores. These findings highlight the potential of simple yet structured interventions in promoting psychological resilience among children, particularly those managing chronic conditions like kyphosis.



Figure 3. Module Display



Figure 4 Star Appreciation

RESULTS AND DISCUSSION

Table 1 Summary of Vital Signs, VAS Data, and Effectiveness of the First Child's Module Implementation

Child's Name	: X1
Age	: 9 Years
Address	:JalanRaya SumberSekar No.89, Dau, Malang
Height	: 131,1 cm
Weight	: 26, 85 kg
BMI Status	:Severely Underweight (15,47)
Parent's Name	: X1Y1
Age	: 37 Years
Parent's Occupation	: Homemaker

Day/Date	Blood Pressure	Temp	Pulse	VAS Scale	Brace Comfort	Diary Writing Consistently	Pre-test Score	Post-Test Score
24 June 2024	121/61	36,5 °C	89x	6	Un-comfortable	Consistently Earned Full Daily Stars	20	80
26 June 2024	119/80	36,6 °C	97X	0	Comfortable	Consistently Earned Full Daily Stars	80	100

X1, a 9-year-old child from SumberSekar, Malang, has shown a strong interest in spinal health from the beginning of the session. With a height of 131.1 cm and a weight of 26.85 kg, X1 has a BMI of 15.47, classified as severely underweight, requiring greater attention to nutritional intake. While engaging enthusiastically with the provided module and coloring book supported by an actively involved mother discussing health and nutrition X1 expressed concern about the heavy weight of their school bag, which could negatively impact posture. Additionally, their undernutrition may weaken bone strength, increasing the risk of kyphosis. Therefore, proper posture while sitting and carrying a school bag should be monitored, adequate nutrition ensured, and screen time regulated to prevent further postural issues. Parental support in providing nutritious meals and managing daily activities is crucial in preventing kyphosis and maintaining optimal bone health.

Table 2 Summary of Vital Signs, VAS Data, and Effectiveness of the Second Child's Module Implementation

Child's Name	: X2
Age	: 8 Years
Address	: SumberSekar
Height	: 118 cm
Weight	: 33 kg
BMI Status	: 23,7 (Normal)
Parent's Name	: X2Y2
Age	: 43 Years
Parent's Occupation	: Teacher

Day/Date	Blood Pressure	Temp	Pulse	VAS Scale	Brace Comfort	Diary Writing Consistency	Pre-test Score	Post-test Score
1 July 2024	118/88	36° C	108 x	2	Comfort able	Consistently Earned Full Daily Stars	40	80
3 July 2024	121/76	37° C	115 x	0	Comfort able	Consistently Earned Full Daily Stars	60	90
6 July 2024	112/84	36° C	111 x	0	Comfort able	Consistently Earned Full Daily Stars	65	95

Initially, X2 displayed a lack of interaction with the nurse, but after one day of assessment, engagement gradually improved, and by the third day, X2 appeared more confident and cheerful. Physically, X2 exhibited kyphosis due to poor posture while using gadgets. Psychologically, initial anxiety and social withdrawal improved following the intervention, marked by increased social interaction and self-confidence. The assessment indicated that improper posture while using gadgets was the primary cause of X2's kyphosis. The intervention included education on proper body positioning, physical exercises to correct posture, and the potential use of a brace for support. The significant improvement in interaction, confidence, and mood after the intervention highlights the effectiveness of a comprehensive approach in addressing the child's biopsychosocial and spiritual well-being. These findings emphasize the importance of thorough assessment and targeted intervention in managing kyphosis and its holistic impact on children's health.

The Finding and Theoretical Implications

The findings of this study indicate that implementing *Diary of My Bone* as a structured journaling intervention with a reward-based system significantly improved the mood and emotional well-being of children with kyphosis. This outcome aligns with Erik Erikson's psychosocial theory, particularly the "Industry vs. Inferiority" stage, where recognition of achievements helps foster self-confidence and motivation in school-aged children (Erikson, 1963; Newman & Newman, 2020). The reward of star stickers helped children feel accomplished, which supported their emotional resilience.

Furthermore, the results support the *Self-Determination Theory* (SDT) developed by Ryan and Deci (2000), which emphasizes that extrinsic motivators can foster intrinsic motivation when implemented supportively. Initially, children responded to external rewards like stickers and certificates, but over time, they began to internalize the behaviors, showing increased independence in managing their routines. This process mirrors findings by Dweck (2006), who notes that reinforcement of effort builds a growth mindset, particularly effective in children facing medical or social challenges.

The behavioral effectiveness of this approach also aligns with principles of operant conditioning by Skinner (1953), where positively reinforced behavior tends to be repeated. As also supported by Kazdin (2005), simple, consistent reward systems can improve health-related behavior and emotional regulation in pediatric populations. Children who were initially reluctant to engage or adhere to brace routines became more consistent over time due to the immediate gratification of earning stars.

Moreover, this study highlights the crucial role of parental involvement. Power (2004) found that children coping with chronic illness showed better outcomes when caregivers were actively engaged in the intervention process. Similarly, in this study, parents encouraged journal completion and reflected on their children's experiences, creating a supportive environment that amplified the intervention's success.

In addition to behavioral outcomes, journaling contributed to the psychological well-being of children by serving as a tool for emotional catharsis. Pennebaker (1997) notes that expressive

writing can improve psychological functioning by helping individuals process their emotions. Children in this study who initially struggled to express themselves became more open, reflective, and socially interactive by the end of the intervention.

Overall, *Diary of My Bone* proved to be an effective, low-cost, and replicable intervention that not only improved mood and adherence to treatment but also fostered emotional growth, discipline, and social skills. These findings are in line with prior research on holistic pediatric care (Babae et al., 2022; Maekawa, 2022; Bastrom et al., 2024) and demonstrate the value of integrating structured, appreciation-based strategies in nursing practice.

The Role of Positive Reinforcement in Behavioral Change

The success of this intervention highlights the role of positive reinforcement in shaping children's behavior and promoting long-term health engagement. The star sticker system served as an immediate and tangible form of recognition, encouraging children to consistently document their activities, emotions, and brace usage. This approach aligns with operant conditioning principles by B.F. Skinner, which suggest that behavior followed by reinforcement is more likely to be repeated. Over time, the continuous cycle of reward and achievement created a sense of routine, making the children more self-disciplined and accountable for their own health.

This effect was particularly evident in children who initially had low motivation or minimal engagement in their health management. For example, children reluctant to wear their brace due to discomfort or self-consciousness about their appearance became more compliant after receiving consistent positive feedback through rewards. By the end of the intervention, many children began wearing their brace without external reminders, indicating that they had internalized the importance of maintaining their posture and spinal health.

The Psychological and Social Impact of the Intervention

Beyond improving individual compliance with health routines, *Diary of My Bone* also had a broader psychosocial impact on the participating children. The intervention fostered a sense of achievement and belonging, as children felt recognized for their

efforts. Many became more open in expressing their emotions, showed higher levels of confidence, and demonstrated improved social interaction with peers and family members.

Parental involvement in this intervention also played a significant role in reinforcing positive outcomes. Parents who actively encouraged their children to complete their journals and engaged in discussions about their experiences helped create a supportive environment that made the intervention more effective. This highlights the importance of family-based interventions in pediatric health, as children tend to respond more positively when they feel supported by their caregivers.

Furthermore, the structured journaling process itself may have contributed to reducing stress and anxiety, as children were encouraged to reflect on their feelings and experiences each day. By identifying their moods and recognizing patterns in their emotional fluctuations, children developed better self-awareness and emotional regulation skills, which are essential for mental well-being.

CONCLUSION

This study confirms that implementing *Diary of My Bone* as an intervention significantly improves children's mood, enhances motivation, and increases adherence to kyphosis treatment routines through a structured reward-based journaling system. The use of star stickers as positive reinforcement played a key role in fostering emotional resilience, self-discipline, and social engagement among the participating children. By providing a simple yet structured approach to promoting mental well-being, this intervention demonstrates potential for broader application in pediatric health programs, particularly for children managing chronic conditions. While the study presents promising findings, further research is necessary to validate and optimize the intervention, particularly by expanding the sample size, incorporating a control group, and exploring digital adaptations. Future interventions should also consider family and school-based implementation, ensuring that children receive continuous support from their social environment. Ultimately, integrating appreciation-based interventions such as *Diary of My Bone* into child healthcare practices could serve as a cost-

effective and accessible strategy for fostering long-term well-being and health-conscious behaviors in children.

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