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The effect of autism risk level based on m-chat on children's emotional responses measured by cars at the pembina state special needs school in Medan

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ABSTRACT

This study aims to identify the level of autism risk in children using the Modified Checklist for Autism in Toddlers (M-CHAT), measure emotional responses using the Childhood Autism Rating Scale (CARS), and analyze the relationship between these variables. The research employed a descriptive quantitative approach with a case study design conducted at SLB-E Negeri Pembina Medan on March 9, 2026. The sample consisted of two children diagnosed with autism, selected purposively based on specific criteria and parental consent. Data were collected through observation, interviews with teachers, and M-CHAT questionnaires completed by parents, then analyzed descriptively by comparing M-CHAT and CARS scores. The findings indicate that children with moderate autism risk exhibit moderate emotional disturbances, while those with high autism risk show severe emotional disturbances. These results reveal a consistent trend that higher autism risk levels are associated with increased severity of emotional response disorders. This study highlights the importance of early autism risk detection as a foundation for developing targeted interventions, particularly in enhancing emotional abilities. The findings are expected to serve as a reference for educators, parents, and healthcare professionals in designing appropriate support strategies for children with autism

Keyword: autism; M-CHAT; CARS; emotional response; early detection

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1. INTRODUCTION

Autism, or Autism Spectrum Disorder (ASD), is a neurobiological developmental disorder characterized by impairments in social communication, adaptive behavior, and emotional regulation. One of the main characteristics of children with autism is limitations in recognizing, understanding, and responding to emotions, both their own and those of others. This condition not only hinders social interaction but also significantly impacts a child's psychosocial development and adaptability in educational settings and daily life (Mardiah, 2025).

Emotional response abilities in children with autism show wide variation; however, various studies indicate consistent difficulties, particularly in recognizing facial expressions, understanding social-emotional cues, and managing emotions appropriately. These limitations emphasize that emotional aspects are a crucial domain that requires attention in special education interventions. Without appropriate intervention, children are at risk of ongoing difficulties in building social relationships and achieving independence (Sopandi, 2022).

In the context of early intervention, early detection of autism is a strategic step to optimize child development. The Modified Checklist for Autism in Toddlers (M-CHAT) is used as a screening instrument to identify autism risk levels from an early age, while the Childhood Autism Rating Scale (CARS) assesses autism severity, including dimensions of a child's emotional responses. Although both instruments have been widely used, their integrated application to examine the relationship between early autism risk and emotional response abilities remains understudied (Sudarmanto & Kurnia, 2025).

Empirically, some studies focus on the relationship between M-CHAT scores and general developmental aspects, such as language or social interaction, while studies specifically linking autism risk levels to emotional responses as measured by CARS are still limited. These limitations are increasingly apparent in the context of special education in Indonesia, particularly in Special Needs Schools (SLB-E), which serve students with diverse characteristics. This situation indicates a research gap that needs to be addressed to generate a more comprehensive understanding (Sibarani et al., 2024).

The urgency of this research lies in the need for empirical data that can serve as a basis for designing more targeted educational interventions, particularly in developing the emotional abilities of children with autism. By understanding the relationship between early autism risk levels and children's emotional responses, teachers and special education practitioners can develop more individualized, targeted, and effective intervention strategies (Angela, 2022).

Based on this description, this study aims to determine the level of autism risk in children using the M-CHAT instrument, measure children's emotional responses through CARS, and analyze the relationship between autism risk levels and children's emotional responses. The findings of this study are expected to provide theoretical contributions to the development of special education, particularly regarding the relationship between early autism detection and children's emotional aspects, as well as practical benefits for teachers and education practitioners in designing more appropriate and targeted interventions according to children's needs, thereby improving the quality of educational services for children with autism.

2. RESEARCH METHOD

This study employs a descriptive quantitative approach with a case study focus to describe the pattern of the relationship between autism risk levels and children's emotional responses without making statistical generalizations. This approach was chosen because it enables the systematic and factual presentation of data related to the phenomenon under study (Sugiyono, 2019). The research was conducted at SLB-E Negeri Pembina Medan on March 9, 2026. The population consisted of all students showing indications of autism, while the sample comprised two children selected through purposive sampling based on specific criteria, namely having been diagnosed with autism and having obtained parental consent (Suharsimi Arikunto, 2018).

The instruments used included the Modified Checklist for Autism in Toddlers (M-CHAT) to assess autism risk levels and the Childhood Autism Rating Scale (CARS) to measure children's emotional responses, both of which are validated tools for autism identification (Robins et al., 2009; Schopler et al., 1980). Data collection was carried out through observation, interviews with teachers, and the completion of the M-CHAT questionnaire by parents as a form of triangulation. Data analysis was conducted descriptively by presenting M-CHAT and CARS scores and identifying patterns of relationships between the two variables without inferential analysis, considering the limited sample size.

3. RESULTS AND DISCUSSION

Data collection in this study was conducted using two main instruments: the Modified Checklist for Autism in Toddlers (M-CHAT) to identify autism risk levels and the Childhood Autism Rating Scale (CARS) to measure children's emotional responses. Each subject was assessed using both instruments to obtain a comprehensive picture of their developmental status, particularly in terms of autism risk and emotional abilities. The measurement results were then classified into specific categories according to the guidelines of each instrument, thereby facilitating data interpretation.

The data obtained from each subject were systematically organized in tabular form to provide a clear comparison of scores and categories. Presenting the data in tabular form facilitates analysis and helps identify patterns in the relationship between autism risk levels and emotional responses in each subject.

Table 1. Results of M-CHAT and CARS Score Measurements on Research Subjects

Subject	M-CHAT Score	Risk Category	CARS Score	Emotional Category
A	3	Moderate	31	Moderate
B	8	High	39	Severe

The table presents the results of measuring autism risk levels using the M-CHAT instrument and emotional responses using CARS for each subject.

Based on the data obtained, Subject A had an M-CHAT score of 3, which falls into the moderate autism risk category. This indicates that the subject exhibits several behavioral indicators associated with autism spectrum disorder but is not yet at a high risk level. A CARS score of 31 places Subject A in the moderate emotional disturbance category, indicating moderate difficulties in recognizing, understanding, and responding to emotions, with potential for improvement through appropriate intervention.

Subject B had an M-CHAT score of 8, which falls into the high autism risk category. This score strongly indicates the presence of autism spectrum disorder, requiring more intensive attention and intervention. A CARS score of 39 places the subject in the severe emotional disturbance category, reflecting significant impairments in emotional responses, including difficulties in understanding both self and others' emotions, as well as expressing emotions adaptively.

The results of this descriptive analysis show a trend in which increasing autism risk scores, as indicated by the M-CHAT, are followed by increasing levels of emotional disturbance based on CARS. This pattern provides initial insight into the relationship between autism risk levels and children's emotional response abilities, although these findings are limited by the small number of subjects.

To further clarify this relationship, the measurement data from the M-CHAT and CARS instruments are presented in diagram form. This visualization aims to provide a clearer comparison of scores between subjects and to facilitate the identification of patterns in the relationship between the two variables.

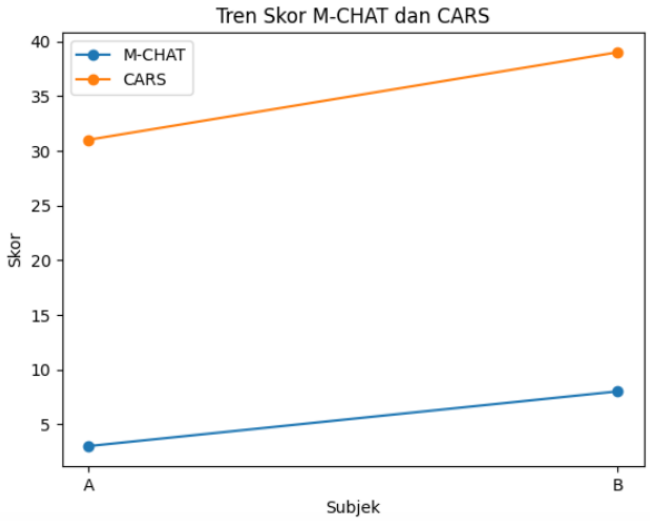

Figure 1. Trends in M-CHAT and CARS Scores in Research Subjects

Based on the diagram, Subject A has lower M-CHAT and CARS scores than Subject B. Subject A is categorized as having moderate autism risk with moderate emotional disturbance, whereas Subject B is categorized as having high autism risk with severe emotional disturbance. This difference indicates a tendency for higher autism risk scores to be associated with greater levels of emotional disturbance. This pattern illustrates the relationship between autism risk levels and children's emotional response abilities and may serve as a basis for designing more appropriate and individualized interventions.

Theoretically, this trend aligns with the view that neurological deficits in individuals with autism spectrum disorder affect the brain's emotional processing systems. Subject B's difficulties in responding to emotions adaptively support previous findings that limitations in social-communicative interactions are often associated with poor emotional regulation. This is also related to the concept of Theory of Mind, in which difficulties in understanding others' mental states may lead to emotional responses that are not aligned with social contexts. Therefore, interventions for children with high autism risk should emphasize emotional regulation, affective recognition, and adaptive response development.

4. CONCLUSION

Based on the research findings, the autism risk level measured using the M-CHAT demonstrates a trend consistent with the level of emotional response disturbances measured using the CARS. Subjects with a moderate level of autism risk exhibited moderate emotional disturbances, whereas subjects with a high level of autism risk showed severe emotional disturbances. These findings indicate a tendency that higher levels of autism risk are associated with greater severity of emotional response disorders in children. This result reinforces the importance of early detection of autism risk as a foundation for designing more appropriate and targeted interventions, particularly in enhancing the emotional abilities of children with autism.

This study contributes to a better understanding of the relationship between autism risk levels and children's emotional responses and may serve as a reference for healthcare professionals, educators, and parents in determining appropriate intervention strategies. However, this study has several limitations, including the

small number of subjects and the limited scope of the research setting, which restrict the generalizability of the findings. Therefore, future studies are recommended to involve larger sample sizes and broader research settings in order to obtain more comprehensive and generalizable results.

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