



Sociodemographic predictors of mental health problems among adolescents in Indonesia: Evidence from SDQ-based cross-sectional analysis

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ABSTRACT

The incidence of mental health problems among adolescents (aged 10-14 years) is increasing, causing a burden of disease. This study aimed to determine the relationship between adolescent characteristics and mental health problems. The study employed a quantitative method with a cross-sectional study design. The sample consisted of 315 junior high school and senior high school students in the Kebasen Subdistrict, Banyumas Regency. Proportionate stratified random sampling was used for sample selection. Data collection was carried out using the Strengths and Difficulties Questionnaire (SDQ), and the data were analyzed using the Chi-Square test. The research findings indicated that age, gender, history of psychological distress, child's education, parental education, school type, and socioeconomic status were significantly associated with mental health difficulties (p -value < 0.05). The variables most significantly contributing to the likelihood of developing mental health difficulties were early adolescence (p -value < 0.05 ; OR 6.75), low socioeconomic status (p -value < 0.05 ; OR 6.42), and a history of psychological distress (p -value < 0.05 ; OR 5.75). Conversely, child's and parental education, as well as school type, showed significant associations but with a lower likelihood. Variables significantly associated with and increasing the likelihood of prosocial mental health problems included a history of psychological distress (p -value < 0.05 ; OR 11.04), early adolescence (p -value < 0.05 ; OR 3.78), and low socioeconomic status (p -value < 0.05 ; OR 2.19). School-based mental health interventions are needed to reduce risk factors and promote adolescent mental health.

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1. Introduction

Mental health is a highly discussed topic today due to the increasing incidence of mental health issues among young people. Adolescence is a critical developmental stage characterized by physical, emotional, and cognitive changes that require adaptation. This makes adolescents a vulnerable group for mental health disorders (Lin & Guo, 2024). Around 8% of the world's young children (aged 5–9 years) and 14% of the world's adolescents (aged 10–19 years) live with a mental disorder (WHO, 2022b). The increase in cases of mental disorders contributed to 11.2 million Disability-Adjusted Life Years (DALYs) in ASEAN countries in 2021. Mental disorders were the leading cause of disease burden in the 10-14 year age group, accounting for 16.3% of the total DALYs due to diseases in this age group. Indonesia, as a

middle-income country, had the highest number of mental disorder cases in ASEAN in 2021, totaling 32.9 million (Scuzs et al., 2025).

The explanation of mental health risk factors includes the biopsychosocial model, which posits that risk factors for mental health problems encompass biological, psychological, and social factors (Murniati et al., 2022). Research findings suggest that the increase in mental health problems among young people is partly influenced by increased social media use after the COVID-19 pandemic, leading to a decline in social interaction and peer support (Branje, 2023). Risk factors for adolescent mental health problems include individual factors such as traits and personality, family conditions, peer relationships, and the school climate (Lin & Guo, 2024). Mental health problems in adolescents during COVID-19 were associated with risk factors such as being female, low socioeconomic status, poor family functioning, and activity restrictions. Protective factors for mental health problems include being male, younger age, engagement in activities, and family support (Karamanova et al., 2025).

Based on the above description, it can be concluded that previous research has explained the risk factors for mental health problems, including biological, psychological, and social or environmental factors, but has not yet elucidated environmental factors related to school types, such as general schools and Islamic-based schools. This study connects various risk factors, including biological, psychological, and social factors, particularly school type, to mental health. Mental health conditions will be further elaborated in terms of mental health difficulty scales and prosocial scales.

The research was conducted in one of the sub-districts in Banyumas Regency, Central Java, Indonesia, specifically Kebasen Subdistrict. The 2022 Banyumas Health Profile data states that the Kebasen Community Health Center has the highest target population for severe mental illness (ODGJ) in Banyumas Regency, totaling 134 individuals (Dinas Kesehatan Kabupaten Banyumas, 2023). The number of target ODGJ in the Kebasen Community Health Center area in 2023 remained in the top 5, with 100 individuals, of whom 79 (79%) were in the productive age group of 22-50 years (Dinas Kesehatan Kabupaten Banyumas, 2024). The WHO recommends strategies to reduce the risk of mental health problems, including promoting mental health and school-based mental health programs (WHO, 2022a). School-based mental health screenings can identify the characteristics and mental health of adolescents. School-based mental health screening is a crucial activity for early identification of at-risk students, enabling mental health services and support to be more systematic and proactive (Connors et al., 2022). The results of the study are expected to provide data and early detection of adolescent mental health and risk factors, thereby informing intervention programmes.

2. Methods

This research employed a quantitative method with a cross-sectional study design to ascertain the relationship between adolescent characteristics and adolescent mental health problems. The study population comprised junior high school and senior high school students in Kebasen Subdistrict, Banyumas Regency, Central Java Province, Indonesia, totaling 1469 individuals. The sample met inclusion criteria of being aged 11-17 years and actively enrolled as a student. The 11-17 age range represents early and middle adolescence, a phase characterized by imbalances in physical and psychological growth rates, alongside a high prevalence of mental health issues within this age bracket (Scuzs et al., 2025). Sample size calculation utilized the Slovin formula, assuming a known population size, a sufficiently large population, and the need for a representative sample. With a research population of 1469, a 5% error margin, and a 95% confidence level, the sample size was rounded up to 315 individuals. The sampling technique employed was proportionate stratified random sampling (Sugiyono, 2020).

The research instrument used was the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a questionnaire designed to assess the psychological adjustment of children and adolescents as an initial screening tool, not for diagnosis. The SDQ consists of 25 statements divided into five subscales. One subscale focuses on strengths (prosocial behavior), and four subscales focus on difficulties (hyperactivity, emotional symptoms, conduct problems, and peer problems). The measurement results for the difficulties scale are categorized into three levels: normal (0-15), borderline (16-19), and abnormal (20-40). The prosocial scale is categorized into three levels: normal (6-10), borderline (5), and abnormal

(0-4). A higher score on the difficulties scale indicates a greater level of difficulty, whereas a high score on the prosocial scale indicates a high level of prosocial behavior (Vugteveen et al., 2022). The reliability of the SDQ instrument was tested using Cronbach's Alpha, yielding values between 0.675-0.705. The instrument's validity test showed an alpha value of $\alpha=0.77$, while the reliability test indicated an alpha value of $\alpha=0.99$ (Liegmann et al., 2024). The analysis of the relationship between adolescent characteristics and mental health problems was conducted using the Chi-Square test. Odds Ratios were obtained by transforming the categories of the prosocial and difficulties scales from three categories into two categories (dummy variables). The 'normal' category served as the control group, while the 'borderline' and 'abnormal' categories constituted the case groups.

This research received ethical approval from the Health Research Ethics Committee, Ministry of Health, Semarang Health Polytechnic, on October 23, 2024, under letter number 1218/EA/F.XXIII.38/2024. The research implementation permit was approved by the Regent of Banyumas on October 22, 2024, with letter number 070.1/556/OL/X/2024.

3. Results and Discussion

Results

- a. Adolescent Characteristics, Univariate analysis first explains the distribution of adolescents based on the difficulty scale. In early adolescence, the normal category includes 112 (72.7%), borderline 40 (26.0%), and abnormal 2 (1.3%). In middle adolescence, the normal category consists of 153 (95.0%), borderline 6 (3.7%), and abnormal 2 (1.2%). Among females, the normal category comprises 142 (81.6%), borderline 28 (16.1%), and abnormal 4 (2.3%). Among males, the normal category includes 123 (87.2%), borderline 18 (12.8%), and no cases of abnormality. There is a history of psychological distress in the normal category for 9 (50.0%), borderline 9 (50.0%), and none with abnormality. For those with no history of psychological distress, the normal category includes 9 (50.0%), borderline 9 (50.0%), and no abnormal cases. Islamic schools have 148 (89.2%) in the normal category, 16 (9.6%) borderline, and 2 (1.2%) abnormal. Public schools have 117 (78.5%) in the normal category, 30 (20.1%) borderline, and 2 (1.3%) abnormal. Senior high schools have 130 (89.7%) in the normal category, 14 (9.7%) borderline, and 1 (0.7%) abnormal. Junior high schools have 135 (79.4%) in the normal category, 32 (18.8%) borderline, and 3 (1.8%) abnormal. Parents with higher education levels have 7 (46.77%) in the normal category, 7 (46.7%) borderline, and 1 (6.7%) abnormal. Those with secondary education have 235 (89.0%) in the normal category, 27 (10.2%) borderline, and 2 (0.8%) abnormal. For primary education, the normal category includes 23 (63.9%), 12 (33.3%), and 1 (2.8%). High socioeconomic status adolescents have 171 (93.4%) in the normal category, 11 (6.0%) borderline, and 1 (0.5%) abnormal. Those with moderate socioeconomic status have 47 (82.5%) in the normal category, 10 (17.5%) borderline, and no abnormal cases. Low socioeconomic status adolescents have 47 (62.7%) in the normal category, 25 (33.3%) borderline, and 3 (4.0%) abnormal.

Univariate analysis second explains the distribution of adolescents based on the prosocial scale. In middle adolescence, the normal category includes 149 (92.5%), borderline 8 (5.0%), and abnormal 4 (2.5%). In early adolescence, the normal category consists of 148 (85.1%), borderline 25 (16.2%), and abnormal 11 (7.1%). Among females, the normal category comprises 148 (85.1%), borderline 18 (10.3%), and abnormal 8 (4.6%). Among males, the normal category includes 119 (84.4%), borderline 15 (10.6%), and no cases of abnormality. There is a history of psychological distress in the normal category for 7 (38.7%), borderline 7 (38.9%), and abnormal 4 (22.2%). For those with no history of psychological distress, the normal category includes 260 (87.5%), borderline 26 (8.8%), and 11 (3.7%) abnormal. Islamic schools have 142 (85.5%) in the normal category, 16 (9.6%), and 8 (4.8%) abnormal. Public schools have 125 (83.9%) in the normal category, 17 (11.4%) borderline, and 7 (4.7%) abnormal. Senior high schools have 121 (83.4%) in the normal category, 15 (10.3%) borderline, and 9 (6.2%) abnormal. Junior high schools have 146 (85.9%) in the normal category, 18 (10.6%) borderline, and 6 (3.5%) abnormal. Parents with higher education levels have 13 (86.7%) in the normal category, 2 (13.3%) borderline, and no abnormal cases. Those with secondary education have 224 (84.8%) in the normal category, 27 (10.2%), and 13 (4.9%) abnormal. Primary education adolescents have 30 (83.3%) in the normal category, 4 (11.1%) borderline, and 2 (5.6%) abnormal. Adolescents with high socioeconomic status have 163 (89.1%) in the normal category, 14 (7.7%)

borderline, and 6 (3.3%) abnormal. Those with moderate socioeconomic status have 44 (77.2%) in the normal category, 10 (17.5%) borderline, and 3 (5.3%) abnormal. Adolescents with low socioeconomic status have 60 (80.0%) in the normal category, 9 (12.0%) borderline, and 6 (8.0%) abnormal.

b. Risk factors for difficulties and prosocial, the bivariate analysis of risk factors for difficulties and prosocial behavior is presented in Tables 1 and table 2.

Table 1.
Bivariate analysis of risk factors for difficulties

Variabel	p value	OR (95 % CI)
Age	0,00	6,75 (3,12-14,41)
Gender	0,09	1,72 (0,93-3,19)
History of psychological distress	0,01	5,75 (2,16-15,28)
Adolescent education	0,03	2,02 (1,08-3,78)
Type of school	0,04	1,88 (1,03-3,45)
Parental education	0,00	0,15 (0,05-0,45)
Socioeconomic level	0,00	6,42 (3,22-12,82)

Table 2.
Bivariate analysis of risk factors for prosocial

Variabel	p value	OR (95 % CI)
Age	0,00	3,78(1,88-7,60)
Gender	0,87	0,95(0,51-1,76)
History of psychological distress	0,00	11,04(4,03-30,2)
Adolescent education	0,63	0,83(0,45-1,53)
Type of school	1	1,13(0,61-2,10)
Parental education	1,00	1,17 (0,25-5,39)
Socioeconomic level	0,02	2,19 (1,17-4,09)

Table 1 above elucidates that all variables exert a significant influence on the difficulties score. Adolescent age holds the highest Odds Ratio (OR) value of 6.75, signifying that early adolescence has a 6.75-fold higher probability of experiencing difficulties compared to mid-adolescence. Second in rank is parental socioeconomic status with an OR value of 6.42, meaning that adolescents from low and middle socioeconomic families have a 6.42-fold higher probability of experiencing difficulties compared to adolescents from high socioeconomic status families. Third in rank is a history of psychological distress with an OR value of 5.75, indicating that adolescents with a history of psychological distress have a 5.75-fold higher probability of experiencing difficulties compared to adolescents without a history of psychological distress. Furthermore, general public schools present a 1.18-fold higher probability of experiencing difficulties compared to Islamic schools.

Table 2 above explains that the variables with a significant influence on prosocial scores are adolescent age, history of psychological distress, and parental socioeconomic status. The history of psychological distress has the highest OR value of 11.04, meaning that adolescents with a history of early psychological distress have a 11.04 times greater chance of experiencing prosocial problems compared to adolescents without a history of psychological distress. Second in order is adolescent age, with an OR value of 3.78, meaning that the early adolescent phase has a 3.78 times greater chance of experiencing prosocial mental health compared to the mid-adolescent phase. Third in order is parental socioeconomic status with an OR value of 2.19, meaning adolescents from low and middle socioeconomic status families have a 2.19 times greater chance of experiencing prosocial problems compared to adolescents from high socioeconomic status families. Furthermore, attending public schools presents a 1.13 times greater chance of experiencing prosocial problems compared to attending Islamic schools.

Discussion

The research findings indicate that early adolescents, females, those with a history of psychological distress, parents with lower educational attainment, lower socioeconomic status, and

attending public schools are at higher risk of experiencing mental health difficulties. Conversely, the risk of prosocial mental health issues is higher among adolescents with a history of psychological distress, early adolescent phase, and low parental socioeconomic status. The three variables that confer a greater opportunity for adolescents to experience mental health difficulties (hyperactivity, emotional symptoms, conduct problems, and peer problems) as well as prosocial issues are early adolescence, a history of psychological distress, and low parental socioeconomic status. School type has a minor opportunity to influence mental health. These variables represent biological, psychological, and social factors.

This research aligns with the biopsychosocial model proposed by Engel in 1977, which posits that the risk of mental health problems is triggered by the integration of biological, psychological, and social issues or dysfunctions within an individual. Socioeconomic status is closely linked to an individual's or group's access to healthcare resources. Resources are necessary to meet biological health needs and influence both physical and psychological well-being (Bolton, 2023). This study is supported by previous research stating that biological factors influencing health include age and female gender; psychological factors encompass personality traits and subjective well-being; and social factors include social support, religiosity, spirituality, and living conditions (Murniati et al., 2022).

In early adolescence (11–13 years old), the proportion of adolescents with borderline and abnormal mental difficulties was higher than in middle adolescence. Among adolescents with an average age of 13.1 years (range 11.9-15.2), 17.0% were found to have probable mental health difficulties and 12.0% had possible mental health difficulties. At an average age of 13.7 years (range 12.6-15.8), 20.7% were found to have probable mental health difficulties and 13.5% had possible mental health difficulties. Meanwhile, at an average age of 14.1 years (range 13.0-16.3), 22.3% were found to have probable mental health difficulties and 13.5% had possible mental health difficulties (Hinze et al., 2026). Vulnerabilities that may occur during early adolescence include social relationships with peers. Peers can have a positive influence through friendship, but they can also be a risk factor for negative behaviors such as smoking and alcohol consumption. Early adolescence is the right time to learn to develop the positive emotions needed to build interpersonal relationships, improve personality and life skills. However, in reality, adolescents' emotional and cognitive development does not keep pace with their physical development. Neuroimaging studies show that the limbic system and prefrontal cortex, which are the centers of emotion and judgment, are not activated simultaneously as they are in adults. This causes adolescents, especially in the early stages, to be vulnerable to emotional mental disorders (Mastorci et al., 2024).

The research findings state that early adolescents have a higher propensity for prosocial issues. Prosocial behavior can be defined as behavior that is beneficial to others, such as helping, giving, and sharing (Crone & Achterberg, 2022). Social connections are important predictors of adolescent prosocial development (Crone & Achterberg, 2022). However, on the other hand, early adolescents tend to be egocentric and consider the benefits of social relationships because their cognitive development is still maturing compared to their faster physical development (Pastor et al., 2024). The use of social media and interpersonal experiences among adolescents raises concerns about a decline in social skills (Steinsbekk et al., 2024). High curiosity in early adolescence prompts adolescents to seek information from various sources, including social media. Based on the above explanation, it can be concluded that early adolescents are a vulnerable phase for mental health problems, considering their immature psychological condition and strong environmental influences.

The research findings indicate that a history of psychological distress presents the greatest opportunity for adolescents to experience mental health difficulties and prosocial issues. This is supported by previous research stating that a history of childhood trauma, such as emotional abuse, physical abuse, harassment, emotional neglect, and physical neglect, is associated with mental health problems like Borderline Personality Disorder (BPD), promiscuity, eating disorders, and suicidal behavior (Zashchirinskaia & Isagulova, 2023). Physical and psychological trauma in early childhood can have long-term mental health impacts in adolescence and adulthood. Abuse such as bullying and neglect dominantly affects several brain regions involved in executive function, cognition, and information

processing, including linguistic comprehension, visual and auditory perception, and movement. Exposure to harsh words and negative emotions from the environment causes adolescents to experience emotional regulation problems that persist into adulthood (Cai et al., 2023). Based on the above description, it can be concluded that adolescents with a history of psychological trauma at a younger age have a high vulnerability to mental disorders due to the impact on brain function, thus requiring early detection and intervention to address trauma.

The research findings state that adolescents from low socioeconomic backgrounds have a greater opportunity to experience mental health difficulties and prosocial issues. Socioeconomic status is one of the social factors influencing mental health. Adolescents from low socioeconomic families are part of a vulnerable population. The WHO defines vulnerable groups, for instance, in economic aspects, due to factors beyond their control that can affect their lives and a lack of equal opportunities compared to other groups. Economic vulnerability leads to an increased potential for external impacts on health, such as unhealthy environments, reduced capacity and opportunities to enhance immunity, and the inability to utilize health resources (Mezzina et al., 2022). Economic or income inequality contributes to social unrest, dissatisfaction, lack of social cohesion, and is a risk factor for depression, especially in women (Occhipinti et al., 2024). Previous research indicates that adolescents continuously exposed to poverty and with poor parental mental health are 6.4 times more likely to experience socioemotional behavioral problems (Adjei et al., 2022).

This research also mentions another social factor influencing adolescent mental health: school type. Adolescents attending public schools have a 1.13 times greater chance of experiencing prosocial issues and 1.88 times greater chance of experiencing difficulties compared to those in Islamic schools. The difference in school type is linked to the Islamic school culture of instilling religiosity more than general schools. Religiosity and spirituality are religious engagements that serve as a guide in life and a coping mechanism in difficult situations (Aggarwal et al., 2023). Previous research has shown that religious immigrant adolescents aged 14-16 consistently experience fewer mental health problems than non-religious adolescents (Aronson, 2022). Religiosity enhances resilience, thereby reducing the risk of depression (Kriebel et al., 2025).

The research findings indicate that the social factor of parental education only significantly influences the difficulties scale, with the opportunity for difficulties in parents with primary and secondary education being only 0.16 times compared to parents with higher education. Higher levels of education are expected to lead to improvements in an individual's cognitive, affective, and psychomotor domains (Bakar & Daulai, 2022). The relationship between parental education and mental health can be linked to increased awareness of the father's role in parenting and the ability to meet economic needs, thereby enhancing a child's happiness, especially for daughters. Neurological studies explain that fathers' brains are more sensitive to daughters' expressions and needs, thus influencing their future emotional development (Fakhrunnisak & Patria, 2022). However, higher education levels are not always associated with possessing extensive specific information about mental health. Therefore, interventions are needed to provide information about adolescent mental health to parents.

Social factors, as found in this study, such as socioeconomic status, education, and school type, are modifiable factors. School-based interventions to strengthen religiosity and spirituality are potential prevention strategies to address the social determinants of mental health. Primary prevention strategies aim to reduce inequalities and improve public mental health, while secondary and tertiary strategies encourage recovery for those identified with mental disorders (Kirkbride et al., 2024).

4. Conclusion

Early adolescent age, a history of psychological stress, and low parental socioeconomic status are factors with the greatest probability for adolescents to experience mental health difficulties (hyperactivity, emotional symptoms, conduct problems, and peer problems); other factors include female gender, junior high schools, and public schools. Meanwhile, factors that contribute to the probability of adolescents experiencing prosocial mental health issues are early adolescent age, a history of psychological stress, and parental socioeconomic status. The higher probability in adolescents with biological (early adolescent age, female gender), psychological (history of social stress), and low

socioeconomic factors, low education, and public schools to experience mental health problems indicates the integration of these three influencing factors in increasing the risk of mental health problems in adolescents. School-based mental health interventions need to be developed to help adolescents reduce risk factors and increase protective factors for adolescent mental health, such as age-appropriate mental health education using a digital approach, early detection, coping mechanism training, and religious reinforcement.

Limitations this research collected data using a self-administered questionnaire by adolescents (Strengths and Difficulties Questionnaire/SDQ). This method is susceptible to reporting bias, such as underreporting or overreporting of symptoms, as well as misinterpretation of questions by respondents. Researchers provided instructions for completion and collaborated with teachers by explaining the questionnaire to prevent reporting bias. The sociodemographic data analyzed in this study only came from adolescents. It would be more complete if it included sociodemographic data on parents related to adolescent mental health. Future studies should include data on parents and teachers to mitigate assessment bias in adolescent mental health.

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