STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

| | Item No | Recommendation |
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| **Title and abstract** | 1 | (*a*) Parental Health Beliefs and Mental Health Service-Seeking for Adolescents: A Cross-Sectional Study Using the Health Belief Model in Urban Indonesia |
| | | (*b*) **Background:** Adolescent mental health is a pressing public health issue, particularly in low- and middle-income countries. Parents serve as primary gatekeepers in adolescents' access to mental health services. Still, recognition of needs is often hampered by low mental health literacy and the prevalence of internalizing symptoms in adolescents. Although the role of parents in investing in children's health has been widely studied, empirical evidence regarding parents' perceptions of adolescent mental health service access remains limited. Therefore, this study aims to assess parents' perceptions of access to adolescent mental health services. **Methods**: This study used a quantitative cross-sectional design involving 107 parents of adolescents aged 10–24. Data were collected using a structured questionnaire to measure parental perceptions of adolescent mental health and access to healthcare. Data were analyzed descriptively and inferentially to examine the relationship between parental perceptions and adolescent access to mental healthcare. **Results:** There are significant associations between perceived vulnerability (p=0.004), perceived severity (p=0.006), perceived threat (p=0.003), and cues to action (p=0.004) with parents' mental health service-seeking behavior. In contrast, perceived benefits, perceived barriers, and self-efficacy did not demonstrate significant relationships. In multivariate analysis, perceived vulnerability (AOR=0.38; 95% CI: CI:0.16–0.89; p=0.026) and perceived threat (AOR=0.39; 95% CI:0.17–0.91; p=0.030) were the only significant factors, suggesting a decreased likelihood of poor service-seeking behavior. Cues to action demonstrated a non-significant protective effect (AOR=0.44; p=0.070). **Conclusion:** Parents' access to adolescent mental health services was primarily associated with perceived vulnerability and perceived threat to adolescent mental health problems. These findings underscore the importance of risk perception within the Health Belief Model framework, without demonstrating a significant role for other constructs |
| **Introduction** | | |
| Background/rationale | 2 | The scientific and rational background of the study is explained in the Introduction section (paragraphs 1–4), covering the urgency of adolescent mental health issues globally and in the context of LMICs/Indonesia, the burden of the problem in Indonesia (I-NAMHS) and in the context of Yogyakarta, the role of parents as gatekeepers and barriers to seeking services, as well as the reasons for using the Health Belief Model framework and evidence gap in the Indonesian context. |
| Objectives | 3 | The research objective is explicitly stated at the end of the Introduction, namely to examine the relationship between parents' perceptions of adolescent mental health and adolescent mental health service-seeking behavior in Pringgokusuman Village, Yogyakarta City, using the Health Belief Model framework. |
| **Methods** | | |
| Study design | 4 | This study employed a quantitative cross-sectional design to examine the association between parental perceptions of adolescent mental health and mental health service-seeking behavior. |
| Setting | 5 | Data collection was conducted between August and September 2024 in the working area of the Gedongtengen Community Health Centre, specifically in the Pringgokusuman sub-district of the Gedongtengen district, Yogyakarta City, Special Region of Yogyakarta. Yogyakarta City is an area that has undergone a transition from a rural to an urban community. The study site was selected based on preliminary health center records indicating a high burden of mental health problems and the highest number of adolescent mental health service visits originating from Pringgokusuman sub-district compared with other areas served by the health center. |
| Participants | 6 | (a) Eligible participants were biological parents (father or mother) of adolescents aged 10–24 years who had resided in Pringgokusuman sub-district for at least six months and provided informed consent to participate. Parents were excluded if they did not complete the questionnaire, could not be contacted after repeated attempts, or if the adolescent was not living with their biological parents. |
| Variables | 7 | This study used questionnaires as data collection instruments. The questionnaires were developed based on the Health Belief Model (HBM) theory. The instruments were |

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| | | then tested for validity and reliability in different subdistricts, but still within the working area of the Gedongtengen Community Health Center, which has the highest number of health service users after Pringgokusuman subdistrict.<br>Both the Guttman Scale and the Likert Scale were used in this study. The Guttman Scale assessed parental behaviour in accessing adolescent mental health services, providing two response options—Yes and No—with a score of 0 assigned to incorrect answers and 1 to correct ones. The Likert Scale was applied to all independent variables, offering five response categories: strongly agree (score 5), agree (score 4), undecided (score 3), disagree (score 2), and strongly disagree (score 1) for favourable statements, and the reverse scoring for unfavourable statements.<br>Parental mental health service-seeking behavior was dichotomized into "good" and "poor" behavior based on the total score obtained. Each HBM construct was also categorized into two levels for analytical purposes as follows: perceived vulnerability ("high" vs. "low"), perceived severity ("high" vs. "low"), perceived threat ("high" vs. "low"), perceived benefits ("high" vs. "low"), perceived barriers ("high" vs. "low"), cues to action ("present" vs. "absent"), and self-efficacy ("high" vs. "low").<br>Cut-off points for dichotomization were determined a priori based on total score distributions and theoretical considerations: 52 for perceived vulnerability, 69 for perceived severity, 70 for perceived threat, 68 for perceived benefits, 55.69 for perceived barriers, 60 for cues to action, and 58 for self-efficacy. Parental service-seeking behavior was classified as "good" or "poor" using a cut-off score of 13. |
| Data sources/ measurement | 8* | The data source for all variables came from a structured questionnaire developed based on the Health Belief Model (HBM) theory and had undergone validity and reliability testing in other subdistricts within the working area of the Gedongtengen Community Health Center. The outcome measurement (parents' behavior in accessing adolescent mental health services) used the Guttman Scale (Yes/No; score 0–1), while all independent variables (HBM constructs) were measured using a 5-point Likert Scale with score reversal for unfavorable statements. All scores were summed and dichotomized (good/bad; high/low) using a cut-off that had been determined a priori (behavior cut-off 13; HBM construct cut-off: 52, 69, 70, 68, 55.69, 60, 58). |
| Bias | 9 | To mitigate bias in this study, we are using a steps: (1) developing a questionnaire based on HBM theory and conducting validity and reliability tests in other sub-districts but still within the same health centre working area, (2) using purposive sampling to ensure that respondents were parents with a direct caregiving role and relevant experience related to the use of adolescent mental health services, and (3) verifying the completeness, consistency, and eligibility of the questionnaire before data entry. |
| Study size | 10 | The sample size was set at 107 respondents. Purposive sampling was used to select participants from an unknown population who met the criteria during the research period. The selection was based on feasibility and availability. |
| Quantitative variables | 11 | Each HBM construct was also categorized into two levels for analytical purposes as follows: perceived vulnerability ("high" vs. "low"), perceived severity ("high" vs. "low"), perceived threat ("high" vs. "low"), perceived benefits ("high" vs. "low"), perceived barriers ("high" vs. "low"), cues to action ("present" vs. "absent"), and self-efficacy ("high" vs. "low"). Cut-off points for dichotomization were determined a priori based on total score distributions and theoretical considerations: 52 for perceived vulnerability, 69 for perceived severity, 70 for perceived threat, 68 for perceived benefits, 55.69 for perceived barriers, 60 for cues to action, and 58 for self-efficacy. Parental service-seeking behavior was classified as "good" or "poor" using a cut-off score of 13. |
| Statistical methods | 12 | (*a*) Statistical methods included descriptive statistics (frequency, percentage), bivariate analysis using chi-square with COR and 95% CI calculations, and multivariate analysis using regression. Variables with $p < 0.25$ in the bivariate analysis were included in the model, and the final results were reported as AORs with 95% CI. Confounder control was performed by adjusting for HBM constructs included in the model. |
| | | (*b*) Subgroup analysis and interaction analysis were not reported in this study. |
| | | (*c*) Respondents who did not fill in one of the question items were not included in the analysis, and the data was removed; then the data was analyzed based on the remaining data. |
| | | (*d*) This study used purposive sampling, and the analysis did not use weighting or adjustments in the sample. Therefore, all respondents who met the inclusion criteria |

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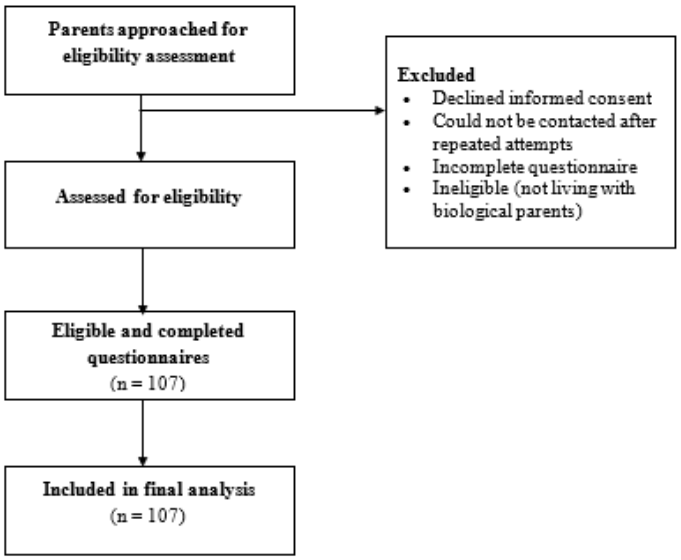
| | | during the study were included in the analysis. |
| | | (*e*) No formal sensitivity analyses were conducted. |
| **Results** | | |
| Participants | 13* | (a) The respondents were 107 parents who had adolescents aged 10–24 years and resided in Pringgokusuman Village; recruitment was conducted using purposive sampling according to the inclusion criteria. |
| | | (b) Non-participation occurred due to refusal to provide informed consent, inability to be contacted after repeated attempts, incomplete questionnaire responses, and ineligibility (adolescent not living with biological parents). The final analyzed sample consisted of 107 parents. |
| | | (c)   Parents were assessed for eligibility and screened based on predefined inclusion and exclusion criteria. Non-participation occurred due to refusal to provide informed consent, inability to be contacted after repeated attempts, incomplete questionnaire responses, and ineligibility. A total of 107 parents met the eligibility criteria and were included in the final analysis (Figure 1). |
| Descriptive data | 14* | (a) This study included 107 parents. All responders were productive (15–64 years). Most respondents were female (88.8%). Only 15.0% had diplomas or higher education, whereas 85.0% had completed primary to secondary education. About one-third of respondents were homemakers (30.8%), followed by traders (6.5%) and self-employed (6.1%). Farmers, public servants, retirees, and other occupations made up a minor fraction of the sample. Most respondents (68.2%) had monthly household earnings below the regional minimum wage criterion, while 31.8% had incomes above it. With respect to family structure, 88.8% of respondents were moms and 11.2% fathers. Most households had one adolescent child (62.6%), followed by two (35.5%) and three (1.9%). Data was obtained on 139 teenagers. In this group, 41.7% were late adolescents (18–24 years), 28.1% were intermediate adolescents (14–17 years), and 30.2% were early adolescents (10–13 years). Exposure information is also presented as distributions of the HBM constructs—perceived vulnerability, perceived severity, perceived threat, perceived benefits, perceived barriers, cues to action, and self-efficacy—as well as a summary of service-seeking behavior outcomes. Demographic/social variables (gender, education, occupation, ) were positioned as potential confounders that could influence the relationship between HBM constructs and service-seeking behavior. |
| | | (b) Missing data was controlled by excluding incomplete questionnaires before data entry. Thus, all respondents analyzed had complete data for each variable studied, and no participants had missing data for any variable. |
| Outcome data | 15* | Report numbers of outcome events or summary measures |
| Main results | 16 | (*a*) There are significant associations between perceived vulnerability (p=0.004), perceived severity (p=0.006), perceived threat (p=0.003), and cues to action (p=0.004) with parents' mental health service-seeking behavior. In contrast, perceived benefits, perceived barriers, and self-efficacy did not demonstrate significant relationships. In multivariate analysis, perceived vulnerability (AOR=0.38; 95% CI: 0.16–0.89; |

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| | | p=0.026) and perceived threat (AOR=0.39; 95% CI:0.17–0.91; p=0.030) were the only significant factors, suggesting a decreased likelihood of poor service-seeking behavior. Cues to action demonstrated a non-significant protective effect (AOR=0.44; p=0.070). Confounding variables were controlled for using multivariable binary logistic regression, including relevant demographic variables and variables with $p < 0.25$ in the bivariate analysis; results are presented as AORs with 95% CI. |
| | | (*b*) Parental mental health service-seeking behavior was dichotomized into "good" and "poor" behavior based on the total score obtained. Each HBM construct was also categorized into two levels for analytical purposes as follows: perceived vulnerability ("high" vs. "low"), perceived severity ("high" vs. "low"), perceived threat ("high" vs. "low"), perceived benefits ("high" vs. "low"), perceived barriers ("high" vs. "low"), cues to action ("present" vs. "absent"), and self-efficacy ("high" vs. "low"). Cut-off points for dichotomization were determined a priori based on total score distributions and theoretical considerations: 52 for perceived vulnerability, 69 for perceived severity, 70 for perceived threat, 68 for perceived benefits, 55.69 for perceived barriers, 60 for cues to action, and 58 for self-efficacy. Parental service-seeking behavior was classified as "good" or "poor" using a cut-off score of 13. |
| | | (*c*) Because this study uses a cross-sectional design, the results are reported in terms of prevalence and proportion only. Reporting the results in terms of relative risk and absolute risk is not relevant in this study. |
| Other analyses | 17 | Additional analysis was not performed in this study. |
| **Discussion** | | |
| Key results | 18 | The main results of the study indicate that several constructs of the Health Belief Model, particularly those related to perceived vulnerability and perceived threat, have a significant relationship with parental behavior in seeking mental health services for adolescents, after adjusting for confounding variables. These findings directly address the research objective of identifying determinants of adolescent mental health service-seeking behavior based on the Health Belief Model framework in the Indonesian urban context. |
| Limitations | 19 | First, the cross-sectional design does not allow for causal inferences between parental perceptions and mental health service-seeking behavior. Second, the use of purposive sampling techniques and the relatively limited sample size may limit the generalizability of the findings to a broader population. Third, data were collected using a self-report questionnaire, which may introduce social desirability or recall bias. |
| Interpretation | 20 | The results of this study indicate that parents' behavior in seeking mental health services for adolescents is mainly influenced by the Health Belief Model constructs related to risk perception, in line with the research objectives. However, these findings need to be interpreted with caution given the cross-sectional design, which does not allow for causal conclusions to be drawn, the use of purposive sampling, which limits generalization, and the possibility of information bias due to self-reported questionnaire-based measurements. The lack of additional analysis also limits exploration of the relationship's complexity. Nevertheless, these findings are consistent with a number of previous studies that emphasize the importance of perceptions of vulnerability and threat in encouraging the search for mental health services, thereby strengthening the relevance of the Health Belief Model as a conceptual framework in the context of adolescent mental health, especially in middle-income countries such as Indonesia. |
| Generalisability | 21 | The generalization of these research results needs to be considered carefully. This study was conducted with parents of adolescents in one urban village in the city of Yogyakarta using purposive sampling, so that local social, cultural, and health service access characteristics may have influenced the results. Therefore, these findings are most relevant to urban contexts with similar characteristics and cannot be directly generalized to rural areas or regions with different health care systems. Nevertheless, the Health Belief Model conceptual framework used is universal, so that the patterns of relationships between constructs found can serve as a starting point for further research and the development of mental health promotion interventions in broader population contexts. |
| **Other information** | | |
| Funding | 22 | This study was supported by a research grant from the Institute for Research and Community Service (LPPM), Universitas Ahmad Dahlan, Indonesia (Grant No. PD- |

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*Give information separately for exposed and unexposed groups.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.