The factor structure among primary school children of the Strengths and Difficulties Questionnaire of Parents (SDQ-PR) in Malaysia during COVID-19

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Abstract: The Strengths and Difficulties Questionnaire (SDQ) is one of the most widely used questionnaires to measure psychosocial adjustment in children. SDQ has been translated into more than 60 languages. However, a published review of 48 studies from 17 different cultural settings reported that the mean and cut-off scores of the SDQ have shown some variation across cultural settings. The discrepancies found in the existing literatures for the factor structure require further investigation. Thus, the aim of the current study is to evaluate the psychometric properties of parent rating SDQ in the Malaysian context, especially during the pandemic. A total of 315 Malaysian parents of children in the age range of 9 to 11 years old who responded to the online survey participated in this study. The results demonstrated acceptable reliability with the internal consistency of Cronbach’s Alpha ranging from .69 to .79 for the subscales of the SDQ except for the subscale of peer problems (Cronbach’s Alpha = .53) indicated insufficient reliability indexed. The model of SDQ showed a fair fit to the data. The results suggested that peer problem items did not reflect the implication during the pandemic. There is a need to further explore the psychological adjustment after the outbreak of COVID-19.

Subjects: Social Psychology; Developmental Psychology; ICT; Family Communication; Development Studies; Research Methods in Development Studies

Keywords: Malaysian parents; psychometric; Strengths and Difficulties (SDQ); peer problem; COVID-19

1. Introduction

Excessive use of media gadgets among primary school-aged children can trigger behavioral and emotional problems when the gadgets are taken away (Agung et al., 2019; Maryam et al., 2016; Suhana, 2017; Ummah, 2018), especially affecting most of the students who had to engage of virtual learning during the pandemic. Thus, a preventative step to screen and identify children with or at risk of behavioral or emotional problems is vitally important. This can help enhance the success of support programmes and early intervention (Doughty, 2005). Such screening is best performed using standardized methods (questionnaire-based measures), especially for primary school-age children.

The Strengths and Difficulties Questionnaire (SDQ), first developed by Goodman (1994), has been commonly used as a screening tool in research, clinical, and community settings on children (Croft et al., 2015). The SDQ functions to measure children’s mental health (Goodman, 2001; Goodman &
Goodman, 2009) in their emotional and behavioral problems (Idris et al., 2019). In addition, it also
 can assess the need for treatment and the effectiveness of existing prevention programmes (Hill &
 Hughes, 2007). It is noted that the SDQ takes its form with a simplified format and one-page-
 questionnaire form of administration (Goodman, 1977). This format benefits the practitioners in
 the ease of administration, especially those not specially trained in the assessment (Idris et al.,
 2019). Not only that, the SDQ also takes advantage of measuring the children’s strengths and
difficulties (Goodman, 1977), as well as screening for externalizing and internalizing problems
(Goodman, 2001). However, the measurement for the children who were experiencing the out-
break of the Coronavirus still lacks evidence on whether the SDQ is still valid for screening.

The SDQ has been translated into more than 60 languages and used across different cultures
(Stone et al., 2010). It can be available in a range of formats such as parent-, teacher-, and child-
report, as well as, downloaded free from the Internet (Goodman et al., 2000). It includes five
sub scales aimed at assessing children’s emotional symptoms, conduct problems, hyperactivity,
peer problems, and prosocial behavior. In assessing children’s strengths and difficulties affected by
COVID-19, it is crucial to measure the SDQ whether it is reliable and valid to use, especially in
Malaysian context. To date, the SDQ psychometric for parents from the Asian countries yield
similar results, where the peer problem has the lower inter reliability, especially in China samples
(Du et al., 2008), Indonesian samples (Wimbarti et al., 2019) and Malaysian samples (Hassan et al.,
2019). These contradictory results need to be delved into a better structure of SDQ in Malaysia.

In the Malaysian context, there is inadequate research on the factor structures of the parent-
report version for SDQ (Gomez & Stavropoulos, 2018; Idris et al., 2019; Stokes et al., 2014)
especially for the primary school children group. Age groups that most of the past studies were
secondary schools, aged 13–14 years old (Idris et al., 2019), 13–17 years old (Hassan et al., 2019),
preschoolers (Croft et al., 2015; Kersten et al., 2018), where some studies focused on the age
groups which was in a large group, 6–17 years old (Stokes et al., 2014), 3–17 years old (Du et al.,
2008). The ambiguous results from different age groups are vital to understand the developmental
stages of the children, especially primary school children. Hence, the objective of the present study
aims to focus on primary school children’s parent rating for SDQ are aged 9–11 years old, to
examine the factor structures of the parent report (SDQ-PR) in Malay and Chinese languages
during the pandemic.

2. Methods

2.1. Participants

A convenience sampling of 315 parents of children in the age range of 9 to 11 years old were
recruited to participate in this study. The gender, age, and races of the participants are
summarised in Table 1. The sample size was selected based on the ratio of respondents to items, 10:1
(Booteng et al., 2018; Clarke & Watson, 1995). Hence, 200–300 respondents were appropriate for
analysis after considering the 20 percent of invalid responses. Mothers’ ages ranged between 29
and 55 years [mean = 40.73 years; standard deviation (SD) = 4.97]. Fathers’ ages ranged between
35 and 51 years [mean = 41.88 years; standard deviation (SD) = 4.90]. More mothers (99.89%) than
fathers participated in the study. The total of respondents who were answering in the Malay
version was estimated 60 percent (Malay, Dusun, Bajau, Bugis) and Chinese were 40 percent
(Chinese, Kadazan). Some Kadazan family went to Chinese schools, and they were capable to
answer in Chinese version.

2.2. Measures

The Strengths and Difficulties Questionnaire (SDQ) is a brief behavioral five-factor instrument
originally developed by Goodman (1977) to assess emotional and behavioral problems in children
and adolescents. The questionnaire was translated into Malay and Chinese languages by two
psychology lecturers who command Malay and Mandarin as their native languages, respectively.
SDQ contains 25 items to measure five domains (Hyperactivity/Inattention, Emotional symptom,
Table 1. Frequency and Percentage of Children’s Gender, Races and Ages

| Demographic | Items       | Frequency | Percentage (%) |
|-------------|-------------|-----------|----------------|
| Gender      | Male        | 185       | 58.7           |
|             | Female      | 130       | 41.3           |
| Races       | Malay       | 52        | 16.8           |
|             | Chinese     | 123       | 39.0           |
|             | Kadazan     | 42        | 13.3           |
|             | Dusun       | 32        | 10.2           |
|             | Bajau       | 35        | 11.1           |
|             | Bugis       | 20        | 6.3            |
|             | Others      | 11        | 3.5            |
| Age (years old) |        |           |                |
|             | 9           | 95        | 30.2           |
|             | 10          | 107       | 34.0           |
|             | 11          | 113       | 35.9           |

Conduct problem, Peer problem, and Prosocial behavior). Each domain of the SDQ consists of five items which are rated on a three-point scale (0 = not true, 1 = somewhat true, 2 = certainly true). Examples of the item for Hyperactivity/Inattention (e.g., overactive, restless, cannot stay still for long), Emotional symptoms (e.g., Often complains of head-ache, stomach-ache or sickness; Many worries, often seems worried), conduct problems (e.g., Often has temper tantrums or hot tempers; often lies or cheats), peer problems (e.g., Has at least one good friend; picked on or bullied by other children), and prosocial behavior (e.g., Kind to younger children; considerate of other people’s feelings).

The SDQ consists of five negative items which are items 7, 11, 14, 20, and 25. Each domain can be calculated by adding scores (after reversing the score for the negative items) on the relevant five items with a minimum score of 0 to the highest score of 10. A total score of the four domains (Hyperactivity/Inattention, Emotional symptom, Conduct problem, and Peer problem) generates a difficulty score (score range from 0 to 40). The higher scores reflect greater difficulties or likelihood of significant problems. The prosocial domain provides a reverse score where higher scores reflect more strengths or more prosocial behaviors. From a total difficulty score and the domain scores, cut-off scores for clinical “caseness” can be generated. The top 10% of scores based on UK population norms were used to define the “Abnormal range”, the next 10% indicate the “Borderline range”, and the remaining 80% of scores as the “normal range” (Goodman, 1977).

2.3. Procedure
Prior to the commencement of the study, permission to conduct the research have been obtained from the Ministry of Education Malaysia and the selected primary schools in Malaysia, which consisted of primary schools from West Malaysia and East Malaysia in 2019. Besides, ethical clearance from the Research Committee of Universiti Malaysia Sabah was obtained. It must be noted that the present study was conducted during the pandemic in the year 2020 and therefore the questionnaire was distributed online using a Google Docs Form. Thus, the respondents involved in this study were those who responded to the online Google Docs Form survey, and consent form had been agreed upon by the parents.

2.4. Data analysis
Factor structures of the Strengths and Difficulties Questionnaire (SDQ) was examined using Confirmatory Factor Analysis (CFA) to test whether the suggested five-factor model of the SDQ could be confirmed in Malaysian context, using IBM SPSS AMOS 23 Program (maximum likelihood method). Model fit was assessed with various fit indices suggested by Hu and Bentler (1998) such as Comparative Fit Index (CFI >0.90), Tucker-Lewis Index (TLI >0.90), Root Mean Square Error of
Approximation (RMSEA 0.05–0.08), and Chi-Square Statistic value (CMIN/DF <5.0). Besides, the reliability of SDQ using internal consistency Cronbach Alpha method was also tested.

3. Results

3.1. Reliability of the Strengths and Difficulties Questionnaire (SDQ)

Table 2 indicates the results with respect to the Strengths and Difficulties Questionnaire (SDQ) reliability. Cronbach's alpha ranges from .53 (peer problem) to .79 (prosocial) for the parent version. The results indicated insufficient reliability indexed by Cronbach's alpha for the subscale of peer problems and acceptable reliability coefficient for the rest of the SDQ subscales.

3.2. The factor structure of the Strengths and Difficulties Questionnaire (SDQ)

The factor structure of the Strengths and Difficulties Questionnaire (SDQ) was examined through Confirmatory Factor Analysis (CFA) with maximum likelihood method. We hypothesized the suggested five-factor model of the SDQ (Goodman, 1977) could be confirmed in Malaysia context. That is, the five first-order factors could be better explained by two broader dimensions of strength (or prosocial) and difficulties. For this reason, we tested a second-order factor model of SDQ with the five first-order factors (refer to Table 3 and Figure 1).

The indices reported in Table 3 show a fair fit of the SDQ model to the data. The CMIN/DF ratio (1.73) and the RMSEA (0.07) achieved the recommended model fit indices, whereas the CFI (0.78) and TLI (0.76) were not met recommended the criteria value higher than 0.90. The analysis of items loading revealed that all items of the SDQ loaded sufficiently on their hypothesized latent variable, except item C22 (loading = 0.58) and item 23 (loading = 0.58). Standardized regression weights for the factor of Prosocial Behavior ranged from 0.52 to 0.75; Emotion Problem (0.44–0.73); Conduct Problem (0.49–0.63); Hyperactive/ Inattention (0.46–0.65) and Peer Problem (0.43–0.68).
4. Discussion and conclusion

The results of this study suggest that the internal reliability of the parent-report version of the SDQ was satisfactory, except for the peer problem subscale. Its reliability was assessed using Cronbach’s alpha. CFA was also performed on the parent-report questionnaire to confirm the satisfactory stability of the model fit indices. From the factor analysis, it showed a five-factor solution (e.g., emotional, conduct, hyperactivity, peer problem and pro-social skill subscales) as aligned to which suggested by Goodman (2001). Most previous studies have yielded that the exploratory factor analysis confirmed the five factors structure (Gomez & Stavropoulos, 2018; Idris et al., 2019; Rodriguez-Hernandez et al., 2012; Sharratt et al., 2018). The five-factor structure of SDQ in this study using a Malaysian sample has some semblances with the findings from previous studies (Bøe et al., 2016; Gomez & Stavropoulos, 2018; Stokes et al., 2014; Stone et al., 2010), reflecting not a good fit in terms of the CFI and TLI values. Accordingly, it was decided to remove Item 22 and 23 from the analysis, and given items’ low variance, it was not considered that this would seriously diminish the quality of all factors associated with conduct problems and (refer to Figure 1). After deleting items C22 and C23, we tested again the model. The result showed a better model fit with the CMIN/DF ratio (1.63), the CFI (0.83) and TLI (0.81), and the RMSEA (0.07).
peer problems subscales respectively. Item 22 was eliminated, and it was consistent with the previous study (Stokes et al., 2014), where the inter reliability was significantly higher after not including the item.

Despite the steps to remove peer problems from the model, these findings raise issues about applying the SDQ instrument in contexts dissimilar to which it was developed. There is a possibility concerning the different views of childhood behavioral issues during the outbreak of COVID-19. It must be noted that the data collection was done during the pandemic in the year of 2020–2021, and hence it could be a dramatically changes of childhood behavioural, for instances, Item 22 (steals from home, school, or elsewhere) and item 23 (gets along better with adults than with other children) are believed no longer relevant as they did not attend the school physically, and most of the time spend during pandemic were at home. Social interaction was restricted, and children barely have good physical interactions with the surrounding. Thus, the Standard Operating Procedure (SOP) that needs to abide by could be one of the factors that influence the internal reliability of SDQ. It is suggested more psychometric research should have examined the factor structure of SDQ after the pandemic, whether the children are being more anti-social due to the pandemic.

As a result, this contributed to the lack of consistency in response patterns as to the reports of child problems can be strongly influenced by cultural expectations (Stokes et al., 2014). The perspective of individualism, self-orientation and independence are vital during the development of the children for the western, on the other hand, the eastern children are taught to obedience and self-control from the early years (Chen et al., 2015). The western culture could be diverse due to immigration, and western children are more sensitive to different cultural values. Compared to Malaysia, the different cultural values are already embedded in the society, and the children have already acknowledged it since they are born. The mix marriages contribute the dynamic perspectives among the young. Hence, more research is needed to identify the underlying problem that are more nuanced among primary school children in the Malaysian context, especially for the items in peer problems. Based on the parent ratings of the SDQ, it was noted that the difference between emotional and behavioral problems specified for the SDQ are unable to be distinguished. Thus, the parent-report version of the SDQ from the previous studies are not in line with the present study and could be due to several underlying consideration. The possible issue could be the developmental stages that the previous studies did not concern on. In the previous study (Gomez & Stavropoulos, 2018), the Malaysian parents from the children who aged 5–13 years old were participated in the study did not fully consider the children development. From the perspective of the child development, 5–6 years old are in the preschoolers’ stage, 7–12 years old are in the primary school stage and 13 years old is considered adolescence. It is practical to focus on one age group to obtain more reliable results. Hence, the present study only selected the primary school children’s parents as respondents after considering of the developmental stages varied across ages.

The findings in the study need to be viewed with some limitations in mind. First of all, the translation of SDQ instrument to another language requires linguistic/semantic equivalence across cultures (Gomez & Stavropoulos, 2018). There is no guarantee that the provided Malay and Chinese version of the SDQ at the homepage had met its linguistic/semantic equivalence, especially in the Malaysian context. Second, the response rate may have affected the findings. Based on a meta-analysis, Cummings et al. (2001) reported that the average response rate to surveys involving health questionnaires was 52% for sample size of around 1,000. In addition, there is another conceivable factor that parent-version of SDQ ratings is influenced by a few background factors (e.g., gender, age, and socioeconomic status). Although the children’s age in this study is controlled, there is no control over other factors, and this may cause the findings to be confounded by them. Despite these limitations, it is hoped that the results yielded in this study would enable a better understanding of the factor structure of the SDQ, and benefit in clinical practice and research involving the SDQ in Malaysia.
In summary, the five-factor model only partially satisfied the criteria for acceptable model fit. Our study suggests there is a need to take note of when using the SDQ due to the unstable and generally questionable factor structure across contexts and informants, especially primary school pupils. Besides, a more diversity samples size selected from all the 13 states in Malaysia based on the developmental stages, for instances, preschoolers, primary school pupils, secondary school students are needed to test its properties in relation after the pandemic is required, especially the peer problem items.

Acknowledgements
We would like to thank Ministry of Higher Education for the fund under Fundamental Research Grant Scheme for Research Acceleration of Early Career Researchers (RACER) (RACER/1/2019/SS05/UMS/1). We also thank Universiti Malaysia Sabah, for given us the opportunity to explore the gadget usage and the behavioral problem among children in Malaysia.

Funding
This work was supported by the Fundamental Research Grant Scheme for Research Acceleration of Early Career Researchers (RACER) [RACER/1/2019/SS05/UMS/1].

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Disclosure statement
No potential conflict of interest was reported by the author(s).

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