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The role of parents in shaping the school age children's behavior regarding the prevention of COVID-19 transmission

Tri Widyastuti Handayani
Poltekkes Kemenkes Yogyakarta, Yogyakarta, Indonesia, 55293
*Corresponding author email: t.widhan@gmail.com

Dyah Dwi Astuti
Poltekkes Kemenkes Surakarta, Surakarta, Indonesia, 57127

Abstract---Background: The COVID-19 pandemic has had both physical and psychological impacts on school-age children. Objective: This study aimed to analyze the impact of the roles of parents on the behaviour of school-age children in preventing the transmission of COVID-19. Methods: This cross-sectional study used a random sampling technique that collected a sample of 346 parents. The survey was carried out by distributing questionnaires to the samples with school-age children 6-12 years. Results: The simple linear regression test proved that the roles had a significant relationship with the behaviour of school-age children in preventing the transmission of COVID-19 (p-value <0.000; r = 0.478; Adjusted R^2 = 22.6). Multiple linear regression analysis showed that the most influential role on the behavior of school-age children was physical wellbeing (p-value = 0.001; r = 0.194) and intellectual wellbeing (p-value = <0.000; r = 0.369) with an Adjusted R^2 of 24.2%. Conclusion: The roles of parents, especially physical and intellectual wellbeing, significantly impacted the behaviour of school-age children in preventing the transmission of COVID-19. The nursing professionals are challenged to optimize the role of parents in shaping the behaviour to prevent the transmission of COVID-19 in school-age children.

Keywords---health belief model theory, parental involvement, pandemic virus, school-age children.

Introduction

Coronavirus disease (COVID) -19 as an emerging infectious disease with high global risk has infected people in 215 countries in the world and 185 countries

have local transmission. On May 15, 2020, a total of 4.248.389 confirmed cases were recorded with 294.046 (6.9%) deaths[1]. At the same time, confirmed cases in Indonesia reached 16.006 cases with 1.043 (6.5%) deaths[2]. COVID-19 cases in children were recorded as 2.143 cases, with 90% of cases causing mild-moderate symptoms and a good prognosis. About 6% of cases of COVID-19 in children cause intensive care, acute symptoms, and death[3]. With regard to school-age children, WHO and the Ministry of Health of the Republic of Indonesia have established policies such as closing public places including schools and social distancing in order to reduce the number of COVID-19 transmissions. On March 18, 2020, the UN Educational Scientific and Cultural Organization estimated 107 countries to close schools and clubs for educational activities, impacting a total of 862 million children both physically and psychologically, especially school-age children[4].

These physical and psychological impacts during the COVID-19 pandemic experienced by children are caused, among others, by restrictions on their daily activities such as going to school, playing in parks, and socializing with friends[5]. Another cause is a large amount of information about COVID-19 from various social media and situations in the community. Information from social media creates a feeling of fear of being infected with COVID-19 and transmitting it to other family members[6]. The results of a study showed the impact as mentioned earlier on the psychology of school-age children[7]. Another study conducted in Wuhan, China, showed that the COVID-19 the pandemic situation caused sleep disturbances and posttraumatic stress disorder (PTSD) with an incidence of around 7%[8]. Another study in China stated that children experienced an increase in the frequency of anger by 67.22%; worsening of daily routine activities by 56.02%; and disturbance in maintaining concentration by 53.94%[9]. The roles of parents are needed to minimize the physical and psychological impacts during the COVID-19 pandemic on children.

Parents, therefore, have challenges in forming new behaviours to prevent the transmission of COVID-19[10,11]. The pandemic itself also affects both psychologically and socio-economically on parents. Psychological effects include emotional disorders, depression, anxiety, and hypochondriasis[5]. The socioeconomic impacts include a decrease in family income which affects the fulfilment of nutrition and hygiene practice facilities such as masks and handwashing soap[12]. The results of previous studies indicated that children's behaviour during the pandemic was related to the physical, emotional, and cognitive reactions of parents[5,13]. Other studies had identified parental knowledge, attitudes and practices during the pandemic. The results showed that parental knowledge was less related to negative attitudes and practices in preventing the transmission of COVID-19[12]. Previous research had focused on the impact of the COVID-19 pandemic on the psychological behaviour of school-age children. Further research on the role of parents and behaviours to prevent COVID-19 transmission is needed for the adaptation of behaviour of school-age children during the pandemic and post-pandemic.

This study aimed to analyze the impacts of the role of parents on the behaviour of school-age children in preventing the transmission of COVID-19. The Health Belief Model Theory by Rosenstock was then applied to analyze the study

variables, i.e., perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. In addition, the holistic and comprehensive roles of parents, i.e., in physical wellbeing, emotional wellbeing, social wellbeing, intellectual wellbeing and physical wellbeing were explained to answer the study question "Is there any impacts of the role of parents on the behaviour of school-age children in preventing COVID-19 transmission?"

Method

Study Design

This quantitative study used a cross-sectional approach to analyze how strong parents' influence on school-age children's behaviours in preventing the transmission of COVID-19.

Population and Study Setting

This research was conducted by an online survey between May-July 2020 through a group of health workers or a group of parents in Java, Indonesia. This research used random sampling technique with inclusion criteria, among others, parents who had children aged 6-12 years, were able to write and read and were not confirmed positive cases of COVID-19 by the polymerase chain reaction (PCR) method, including their children. The exclusion criteria included parents who refused to participate in the study and parents who had children with developmental disorders such as autism spectrum disorder (ASD).

The Slovin formula was used to determine the sample size:

$$n = \frac{N}{(1 + (N \times e^2))}$$

Notes:
N = population
e = margin of error is set to 5% or 0.05
$n = 1000 / (1 + (1000 \times (0.05)^2))$
$n = 1000 / (1 + (1000 \times 0.0025))$
$n = 1000 / (1 + 2.5)$
$n = 285.7143 = 286$

The collected sample size was 326 parents, exceeding the minimum number of samples.

Variable

- The dependent variable: the behaviour of school-age children in the prevention of COVID-19 transmission consisted of 20 questions which included questions about perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. Percentage = Total score obtained/80 x 100%.
    - Perceived susceptibility consisted of 2 statements relating to beliefs

about the vulnerability of children to be infected with COVID-19 and transmitting it. The Likert scale measured the statement items with category: 4 strongly agree, 3 agree, 2 disagree, and 1 strongly disagree. Percentage = Total score obtained/8x100%.

- Perceived severity consisted of 2 statements relating to children's beliefs about the severity of health problems caused by COVID-19 infection. The statement items were measured on a Likert scale with category: 4 strongly agree, 3 agree, 2 disagree, and 1 strongly disagree. Percentage = Total score obtained/8 x100%.
- Perceived barrier consisted of 6 statements relating to children's behaviour that hindered efforts to prevent the transmission of COVID-19. The Likert scale measured the statement items with category: 4 strongly disagree, 3 disagree, 2 agree, and 1 strongly agree. Percentage = Total score obtained/24 x100%.
- Perceived benefit consisted of 8 statements relating to children's behaviour related to actions that had a positive impact on preventing the transmission of COVID-19. The statement items were measured on a Likert scale with category: 4 strongly agree, 3 agree, 2 disagree, and 1 strongly disagree. Percentage = Total value obtained/32 x100%.
- Cues to act consisted of 2 statements relating to children's signs to take precautionary measures for the transmission of COVID-19. The statement items were measured on a Likert scale with category: 4 strongly agree, 3 agree, 2 disagree, and 1 strongly disagree. Percentage = Total value obtained/8 x100%.

- Independent variable: the roles of parents consisted of 20 statements which included statements about the roles of social wellbeing, physical well being, emotional wellbeing, intellectual wellbeing, and spiritual wellbeing. Percentage = Total score obtained/80 x 100%.
  - The role of physical wellbeing consisted of 5 statements relating to meeting physical needs to increase immunity, such as nutritional needs and immunization needs. The statement items were measured on a Likert scale with category: 4 always, 3 often, 2 sometimes, and 1 never. Percentage = Total score obtained/20 x100%.
  - The role of emotional wellbeing consisted of 3 statements relating to the role of recognizing stress, anxiety, and fear in children. The statement items were measured on a Likert scale with category: 4 always, 3 often, 2 sometimes, and 1 never. Percentage = Total score obtained/12 x100%.
  - The role of social wellbeing consisted of 2 statements relating to social welfare, such as accompanying children to call friends and teachers at school. The statement items were measured on a Likert scale with category: 4 always, 3 often, 2 sometimes, and 1 never. Percentage = Total score obtained/8 x100%.
  - The role of intellectual wellbeing consisted of 9 statements relating to the need to learn knowledge and skills in preventing COVID-19 transmissions such as hand washing and cough etiquette. The statement items were measured on a Likert scale with category: 4 always, 3 often, 2 sometimes, and 1 never. Percentage = Total score obtained/36 x100%.
  - The role of spiritual wellbeing consisted of 1 statement relating to fulfilling spiritual needs such as praying and worshipping together. The

statement items were measured on a Likert scale with category: 4 always, 3 often, 2 sometimes, and 1 never. Percentage = Total score obtained/4 x100%.

Data Collection

Parents' identity questionnaires included age, occupation, education, socioeconomic, demographics, and knowledge. Characteristics of the child included age, gender, and history of comorbidities. The questionnaire on the roles of parents in preventing COVID-19 transmission is made based on the theory developed by[11]consisting of 20 questions covering roles in social wellbeing, physical wellbeing, emotional wellbeing, intellectual wellbeing, and spiritual wellbeing. The questionnaire on the behaviour of school-age children in the prevention of COVID-19 transmission is the application of Health Belief Model Theory by Rosenstock theory in 1966 and modified from the questionnaire by[14] about maternal hygiene behaviour in hospitalized children. The questionnaire consisted of 20 questions which included perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and cues to action. The questionnaire had been reviewed by experts, that was child specialist nurses. The questionnaire had tested the validity and reliability of 40 parents with the results of Cronbach's alpha on the roles of parents at 0.740 and on the behaviour of school-age children at 0.738.

Data Analysis

The Pearson test was used to determine the relationship between the role of parents and the behaviour of school-age children; simple linear and multiple linear regression statistical tests were used to determine the effect of the role of parents on the behaviour of school-aged children, as well as the most dominant role of parents influencing the behaviour of school-aged children. Statisticians and social psychologists then validated the results of the analysis.

Ethical Considerations

This research has passed the ethical review from Sebelas Maret University with number 121/UN27.0661/KEPK/EC/2020. The assessment of the ethical clearance includes seven standards which are social values, scientific values, distribution of burdens and benefits, potential benefits and risks, persuasion or exploitation or undue inducement, confidentiality or privacy, and informed consent.

Result

Parent Characteristics

Table 1
Characteristics of research respondents based on the identity of parents and children

Variable	Respondent	
	(n)	(%)
1. Parent Identity		
a. Age		
- < 20 y.o	1	0.3
- 20- < 60 y.o	323	99.1
- ≥ 60 y.o	2	0.6
Total	326	100
b. Education		
- Not finishing elementary school	2	0.6
- Only finishing elementary school	13	4
- Only finishing high school	44	13.5
- Finishing higher education	267	81.9
Total	326	100
c. Employment		
- Unemployed	61	18.7
- Employed	265	81.3
Total	326	100
d. Living with children		
- Yes	314	96.3
- No	12	3.7
Total	326	100
e. Family Relation		
- Father	70	21.5
- Mother	256	78.5
Total	326	100
f. Demography		
- Rural	129	39.6
- Urban	197	60.4
Total	326	100
g. Income during Pandemic		
- Affected	217	66.6
- Not affected	109	33.4
Total	326	100
h. Knowledge about COVID-19		
- Bad	81	24.8
- Good	245	75.2
Total	326	100
i. Information Source on COVID-19		
- Health worker	132	40.5
- Social media	179	54.9

Variable	Respondent	
	(n)	(%)
- Neighbor or surroundings	3	0.9
- Others	12	3.7
Total	326	100
2. Child Identity		
a. Age		
- 6- < 8 y.o	142	43.6
- 8- < 10 y.o	102	31.3
- 10-12 y.o	82	25.1
Total	326	100
b. Gender		
- Female	160	49.1
- Male	166	50.9
Total	326	100
c. History of Comorbid		
- Yes	5	1.5
- No	321	98.5
Total	326	100

There were 326 parents with the majority of those who filled out consisted of mothers (256/78.5%). The majority of parents in this study were in the productive age (323/99.1%) and working (265/81.3%) categories. Parents stated that the COVID-19 pandemic has an impact on family income (217/66.6%). The majority of parents had children aged 6 to less than eight years (142/43.6%), male (166/50.9%), and no comorbidities (321/98.5%). Parents live with children (314/96.3%), so it is easy to monitor the behaviour of school-age children (Table 1). Most of the parents lived in urban areas (197/60.4%) and had a high level of education (267/81.9%). The social demographic characteristics of these parents had an effect on the ease of access to information about COVID-19 through social media (179/54.9%). Ease of access to information had an impact on increasing parental knowledge about the prevention of transmission of COVID-19 in school-age children (245/75.2%) (Table 1).

The Influence of Parents Role with School-Age Child Behaviour

Table 2
Description of the role of parents and behavior of school-age children in the prevention of transmission COVID-19

Variable	Mean	SD	Min-Max	CI 95%
The roles of parents	86.01	8.72	58-100	85.86-86.96
- Physical Wellbeing	77.98	11.65	40-100	76.71-79.24
- Emotional Wellbeing	82.13	14.68	33-100	80.53-83.73
- Social Wellbeing	80.71	16.65	25-100	78.90-82.53
- Intelectual Wellbeing	92.23	9.46	56-100	91.20-93.26
- Spiritual Wellbeing	92.41	17.04	25-100	90.55-94.26
Behavior of School-Age Children	79.02	6.98	61-95	78.26-79.78

-	Perceived Susceptibility	79.18	11.40	38-100	77.94-80.42
-	Perceived Severity	84.89	12.71	50-100	83.51-86.28
-	Perceived Barrier	63.15	9.31	25-100	62.14-64.17
-	Perceived Benefit	87.34	11.39	56-100	86.10-88.58
-	Cues to Action	87.31	12.46	50-100	86.10-88.58

The role of parents (mean = 86.01) and behaviour of school-age children (mean = 79.02) in preventing the transmission of COVID-19 were in a good category. The highest role of parents was spiritual wellbeing (mean = 92.4); while the role of parents that need to be improved was the role in physical wellbeing (mean = 77.98). The highest behaviour of school-age children was perceived benefits (mean = 87.34); while the lowest mean was perceived barrier (mean = 63.15) (Table 2).

Table 3
The relationship between the roles of parents and the behavior of school-age children in preventing the transmission of COVID-19

Variable	(r)	*p-value*
The roles of parents		
- Physical Wellbeing	0.383	< 0.000
- Emotional Wellbeing	0.233	< 0.000
- Social Wellbeing	0.232	< 0.000
- Intelectual Wellbeing	0.468	< 0.000
- Spiritual Wellbeing	0.189	0.001

Note: Bivariate Test Results with Pearson Test

Table 4
The impacts of the roles of parents on the behavior of school-age children in preventing the transmission of COVID-19

Variable	B	SE	Beta	t	*p-value*
Constant	46.140	3.376	-	13.667	<0.001
The roles of parents	0.382	0.039	0.478	9.788	<0.001

Note: Result of Simple Linear Regression Test with Adjusted R^2 = 22.6%

The bivariate analysis showed that the component of intellectual wellbeing had the strongest correlation with children's behaviours at 0.468 in the medium category; while the lowest correlation was on the component of spiritual wellbeing at 0.189 in the low category (Table 3). Parents' roles influenced school-age children's behaviours in preventing the transmission of COVID-19, with a mean of 0.478 which was in the medium category. The adjusted R^2 was 22.6%, meaning that the role of parents to explain the behaviour of school-age children in preventing the transmission of COVID-19 was 22.6%. The regression equation was the behaviours of school-age children equals 46.140 + 0.382 role of parents in preventing COVID-19 transmission (Table 4).

Table 5
The components of the impacts of the roles of parents that have the most impact on the behavior of school age children in preventing the transmission of COVID-19

Model	Variable	B	SE	Beta	t	*p-value*	R^2
I	- *Constant*	43.719	3.520	-	12.422	<0.000	23.9%
	- *Physical Wellbeing*	0.116	0.035	0.194	3.289	0.001	
	- *Emotional Wellbeing*	-0.004	0.027	-0.008	-0.142	0.888	
	- *Social Wellbeing*	0.012	0.023	0.030	0.536	0.592	
	- *Intelectual Wellbeing*	0.252	0.045	0.341	5.550	<0.000	
	- *Spiritual Wellbeing*	0.025	0.021	0.061	1.189	0.235	
II	- *Constant*	43.675	3.500	-	12.479	<0.000	24.1%
	- *Physical Wellbeing*	0.115	0.034	0.192	3.353	0.001	
	- *Social Wellbeing*	0.012	0.022	0.028	0.518	0.605	
	- *Intelectual Wellbeing*	0.251	0.045	0.340	5.597	<0.000	
	- *Spiritual Wellbeing*	0.025	0.021	0.060	1.182	0.238	
III	- *Constant*	43.813	3.486	-	12.569	<0.000	24.3%
	- *Physical Wellbeing*	0.118	0.034	0.198	3.507	0.001	
	- *Intelectual Wellbeing*	0.257	0.043	0.348	5.914	<0.000	
	- *Spiritual Wellbeing*	0.025	0.021	0.061	1.192	0.234	
IV	- *Constant*	44.883	3.370	-	13.317	<0.000	24.2%
	- *Physical Wellbeing*	0.116	0.034	0.194	3.441	0.001	
	- *Intelectual Wellbeing*	0.272	0.042	0.369	6.552	<0.000	

Note: Multiple Linear Regression Test Results

In the multivariate analysis, linear regression showed that the component of parents' roles having the strongest influence on school-age children's behaviours in preventing the transmission of COVID-19 was physical wellbeing which was 0.001(r = 0.194) and intellectual wellbeing which was <0.000 (r = 0.369). The adjusted R^2 was 24.2%, meaning the ability of the role of physical wellbeing and the role of intellectual wellbeing in explaining the behaviour variables of school-age children were 24.2%. The equation obtained was that the behaviour of school-age children in the prevention of COVID-19 transmission equals 44.883 + 0.116 the role of physical wellbeing + 0.272 the role of intellectual wellbeing (Table 5).

Discussion

Characteristics of the Respondent

The results showed that the majority of parents were in the productive age category, highly educated, working, residing in cities, and having an impact on income during the pandemic. Urban areas have better economic levels and

facilities than rural areas so that residents living in urban areas are better equipped to provide equipment to prevent the transmission of COVID-19[13]. Different research results show that in urban areas, a higher transmission of COVID-19 is related to population mobility and the use of public transportation[15]. In this study, the majority of parents had a high level of education and good knowledge about preventing the transmission of COVID-19. The results of the same study conducted in Hubei China stated that 90% correctly filled out a questionnaire on knowledge and prevention of COVID-19 transmission; 97.1% said they believed they would win the fight against the COVID-19 pandemic, and 98% stated that they used a mask when leaving the house. Male gender, young age, and student status increase the risk of having lousy behaviour which is associated with high activity outside the home. Increased knowledge will improve attitudes and good practices in preventing the transmission of COVID-19[12]. The results showed that the majority of parents' income was affected by the pandemic. The economic impact is positively correlated with the onset of anxiety symptoms in children such as boredom, concentration problems, and sleep disturbances. This psychological impact causes a decrease in body immunity, resulting in an increased risk of being infected with COVID-19. Further research explains that children who live at home with their parents will reduce anxiety levels[16,17].

The Impacts of the Roles of Parents in Prevention of COVID-19 Transmission on School-Age Children

The results showed that the comprehensive role of parents influenced the behaviour of school-age children in preventing the transmission of COVID-19. Its comprehensive roles included physical, emotional, social, intellectual and spiritual wellbeing. These roles can actually be carried out as a fun activity by interspersing play and storytelling[18]. Activities at home that are fun for children will increase the body's immunity by increasing endorphins which reduce pain and maintain emotions[19]. Parents maintain children's sleep 9-11 hours to maintain emotional stability and optimize growth hormone at night[10]. Parents need to assist children in accessing the information on social media to meet social needs, channelling their talents and skills, and maintaining their emotions[17].

The results showed the lowest mean on the role of physical wellbeing that included early detection and getting children to care about the physical environment. Parents may experience difficulties in early detection of signs and symptoms of COVID-19 because the average number of cases in children is 90% showing asymptomatic, mild, and moderate symptoms[20]. The role of early detection is still essential to prevent the occurrence of COVID-19 transmission, such as measuring the child's body temperature regularly[21,22] . Another role is that parents invite children to do physical activities that can increase immunity, such as sunbathing, by implementing health protocols[23]. Parents also need to encourage children to care about creating a clean environment, such as cleaning equipment that is often touched using disinfectants[11].

The results showed that the role of parents that most influenced the behaviour of school-age children was physical wellbeing and intellectual wellbeing. This is following the stage of growth and development of school-age children. In Erikson's theory of psychosocial development (1963), school-age children are at the

industrial versus inferiority stage, where children learn about rules such as wearing masks and maintaining distance when playing with friends. Piaget's theory of development (1969) added school-age children to the concrete operation stage, i.e., children learning based on logic, as well as causal relationships in problem-solving[24]. The behaviour of school-age children had a mean of more than 75%. The lowest mean was a perceived barrier. Barriers experienced by parents were difficulties in explaining the importance of implementing health protocols during play, children experiencing boredom, less time for parents to accompany children, an environment that had not been disciplined in applying health protocols, and culture in society. UNICEF (2020) recommends having an open dialogue according to children's development.[25] Parents as role models are obliged to explain to children about the COVID-19 pandemic in language that is easy to understand and to give examples of hygiene behaviour[26].

This study proved that the roles of parents had a significant effect on the behaviour of school-age children, especially perceived susceptibility, perceived severity, perceived benefits and cues to action. Other studies show that research respondents have a higher perceived severity for the impact of COVID-19 infection than the perceived susceptibility to COVID-19 infection. The practice of preventive action is related to belief in risk and behavioural responses. Belief in the risk of disease will increase confidence in protective behaviour that affects adaptive behaviour[27]. Perceptions of the severity of signs and symptoms and viewing COVID-19 as a severe disease will cause parents to contact health workers when children experience signs and symptoms of the disease[15].

The pandemic will have an impact on the role of parents in providing welfare to children[28]. This impact depends on the stressors faced by the family, such as job loss, decreased family income, social distancing, regional quarantine, and previous family history. Children's welfare is formed from 3 key components, i.e., excellent communication between children and parents, belief or family belief systems, and organization on the psychosocial impact of the COVID-19 pandemic[17]. Increasing the role of parents in shaping children's behaviour is done through the concept of "social learning" as the provision of information and health education aggressively on a family basis to optimize the role of the family. Communication strategies with cultural and religious approaches are needed to increase confidence in the risk of disease to form positive preventive behaviour[27,29].

This research focused on the roles of parents in a holistic manner which included the role of physical wellbeing, emotional wellbeing, social wellbeing, intellectual wellbeing, and spiritual wellbeing. The results of the study can be used as a guideline for preparing education in health promotion activities by optimizing the roles of parents to form positive behaviours to prevent COVID-19 transmission. The limitation of this study is that the research was conducted through an online survey so that it was unable to reach parents who were not available with internet and smartphone networks. Further research can be carried out using interview and observation data collection methods, as well as the need for research to examine the most effective interventions to optimize the role of parents in shaping school-age children's behaviour in preventing the transmission of disease. From the results of the analysis, it can be concluded that the parents' comprehensive

and holistic roles included the role of physical wellbeing, emotional wellbeing, social wellbeing, intellectual wellbeing, and spiritual wellbeing which affected the behaviour of school-age children in preventing the transmission of COVID-19. The health professionals are obliged to optimize the role of parents to improve the positive behaviour of school-age children in preventing the transmission of COVID-19 by providing family-based information and education.

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