



The impact of COVID-19 pandemic on school-age children' anxiety level in Jeddah, Saudi Arabia

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Abstract

Covid-19 is a recently discovered virus that has rapidly turned into a pandemic disaster that increases the threat of higher levels of anxiety, especially among young children. This study aimed to assess the prevalence of anxiety levels among school-age children and their associated factors. Which is education, family, and physical activity factors while experiencing social distancing during COVID-19 in Jeddah city, Saudi Arabia. A quantitative descriptive

cross-sectional design with an online survey questionnaire using Google platform was applied and filled by the guardians of the school-age children between the ages of 6–12 years old. It contains two validated scales, the Numerical Rating Scale (NRS) and Children's Anxiety Questionnaire (CAQ) that have been used to measure the anxiety level. In the present study, according to the NRS scale, 15.58% (n=55) revealed low levels of anxiety scores and according to the CAQ scale, the majority of children felt a low

anxiety level with 17% (n=60). The study concluded that children should increase their interaction with their teachers during the online classes. Mental support should be given to the children in case someone in the house gets diagnosed with COVID-19 and/or in case children get worried that their guardian will get infected.

Keywords: anxiety; children; Covid-19; parents; pandemic; social isolation.

* **Background**

Coronaviruses (COVID-19) is a big family of enveloped, single-stranded, zoonotic RNA viruses. A new version of the coronavirus SARS-CoV-2 causes COVID-19. The first case of this disease occurred in the Wuhan city in China, which rapidly gave rise to a global pandemic. One of these pandemic consequences is the higher level of anxiety, especially in school age children. Anxiety is a common psychiatric disorder in Saudi Arabia. Furthermore, anxiety is contiguous and defined as an uncomfortable feeling of uncertainty, worry, whose source is unknown. It has a great influence on children in a negative manner all over the world. Events such as school closures have impacted daily life activity for them.

A systematic review has shown that children with COVID-19 mostly convalesce within one to two weeks after the onset of the disease [1]. The pandemic caused quarantine and constraints, which are remarkably disconcerting for children [13]. The World Health Organization (WHO) has made suggestions for dealing with the pandemic's psychological and psychiatric impact, which is crucial for children. They ought to be able to describe their experiences and feelings of worries and concerns with their own expressions. Therefore, it was necessary to measure the anxiety level among school-age children in the pandemic of the century [6]. Also, the questionnaire used in this study highlights the children's parents' viewpoint by using the appropriate measures for the children's age.

The problem statement of this study has covered the gender variances because there were limited studies included that. And used validated and standardized psychometric quality tools. Moreover, there are no relevant studies that were conducted about the impact of COVID-19 on school-age children's anxiety level in Saudi Arabia. The nature of the problem is that the outbreak of Covid-19 is

unstable. Therefore, the unknown situation will raise the anxiety level. To clarify, anxiety is a serious health problem, and most school age children could be affected by the continuous changes that happen because of the pandemic, which increases the high rate of anxiety level. For this reason, it was hard to assess the school-age children's anxiety level as they might be affected in various aspects such as psychologically, emotionally, physically, functionally, socially, it also could affect their educational status, decrease their productivity and creativity. There were no studies that assessed the level of school age children for both genders during COVID-19 pandemic in Saudi Arabia.

A study conducted in Brazil found that the prevalence of anxiety level was 19.4%, and it is even higher among children with parents working in essential jobs, and also among the children who performed social distancing without their parents [3]. Another study examined the anxiety and depressive symptomatology in Italian, Spanish, and Portuguese children, and adolescents so they can detect which variables are affecting their well-being during the pandemic. And the results showed variances in

anxiety and depression levels between countries, and higher anxiety scores in Spanish children and higher depression scores in Spanish and Italian children compared to the Portuguese. The parents who had higher levels of anxiety were more likely to have children with depression and anxiety symptoms [9].

The following variables were focused on in this study; the family factor is one of the most important factors that could affect the children, the family can either reduce the child's problem or increase it. Children usually rely on their caregivers to understand their environment, recognize, process, and deal with threats, as well as get help and guidance from them. Especially during a COVID-19 pandemic and the quarantine situation. The family is continuously in contact with their children and their behaviors and actions could affect them. A study conducted in Spain showed that children were affected by their parents' perceived distress and emotional response to the COVID-19 crisis either to trigger a positive or negative outcome on their children [10]. The parents' distress and emotional problems were more specifically

correlated with child negative outcomes. Also, a study in China revealed the effect on children's anxiety rates of 17% and depression rates of 22.6% [9,10].

Furthermore, the education of children during the pandemic period became volatile. Children have been greatly affected in their development, learning, participation, and attention in the lessons. A USA study stated that between 7 children there is 1 child who has maltreatment because there is no strong communication with their teachers as well as their classmates, which was because of the stress and potential mental health problem due to COVID-19 pandemic. However, this problem may affect the school age children's interaction during the virtual class and that causes poor school performance [5]. The school-age children lost their attention during the class because of the noisy acoustic environment and the distraction like the electronics and also the absence of parental supervision.

In Addition, physical activity is defined as all movement including during leisure time, for transport to get to and from places, or as part of a person's work. Based on the study about COVID-19 in Germany showed

that the effect of COVID-19 has been serious and global. However, in this study, they looked at the physical activity and recreational screen time of a representative test to a small sample of kids previously and during the stricter of the first COVID-19 lockdown in Germany. They found that physical movement declined while recreational screen time expanded [11]. Another study in Brazil showed a decline in physical activity with increasing age yet rises with the presence of outside space at home. No huge or impacts were noticed for different factors but age and outside space at home are indicators of physical activity. Therefore, they found that the Household and individual attributes of Brazilian kids impact the degree of physical activity performed by them during social separation [12].

The aim of this study is to assess the prevalence of anxiety level among school-age children and its associated factors while social distancing during COVID-19 in Jeddah city, Saudi Arabia. The Question of this research is: What is the impact of COVID-19 pandemic on school-age children's anxiety level in Jeddah, Saudi Arabia?

* Method

* Study Design

A quantitative descriptive cross-sectional design disseminated through social media within the urban regions of Jeddah, Saudi Arabia.

* Sample and sample size

Data has been collected via online survey questionnaires from the guardians of the children. A sample of 353 completed the survey randomly. Only 257 of the 353 of the respondents live in Jeddah. Out of 257, 4 of the participants refused to take part in the survey. So, the appropriate sample size of participants was 253. The inclusion criteria included school-age children (6-12) years, living in Jeddah city. The exclusion criteria included children aged below 6 and above 12, living outside Jeddah city.

* Tool / Instrument

The tools used in the study were adopted, and the questions were modified. Two validated scales to measure anxiety levels in the children. The Numerical Rating Scale (NRS) and Children's Anxiety Questionnaire (CAQ) which is a Swedish instrument that could be utilized to assess self-reported anxiety in children [7,8,14,4]. The questions of the survey were available online. To maintain validity

we translated the questions by an official SWAN translator and have been double checked by the supervisor. The questionnaire was in English and Arabic languages. The questionnaire included eight sections which will be described below.

The first section contains a brief introduction to the study purpose, confidentiality, implied consent, checking if the child is willing to participate, and whether they live in Jeddah city or not. The second section is to consent to participate in the study.

The third and fourth sections were to determine the socio-demographics of guardians and their children. The guardian's quantitative variables are: to know the relationship with the child who is socially distant because no one knows the child like his/her parents; since the salaries in Saudi Arabia did not decrease during the pandemic knowing the usual income level can tell us if their essential needs were fulfilled and how it can affect the child anxiety level. The children quantitative variables are: gender, age, to know if the child is in the social distance with the presence of the family most of the time, does the child have a chronic illness or disability as it can be a risk factor to

increase the anxiety level of the of children as well as the hours of the day the child remains in social distancing, if the child understands (considering the age group) the situation that we are experiencing, the more awareness of coronavirus the less anxiety level.

The fifth section was the education factor, since studying occupies half of the children's day during the school days. Due to the pandemic, this has affected a large part of the child's daily activity which may cause anxiety. The education factor variables are: to find out if the child is having difficulty interacting with the virtual classes due to the pandemic or not, if the child requires monitoring during online classes to deduce the extent of the child's focus and his/her ability to understand because increased anxiety level affects both.

The sixth section was the family factor, to measure the extent to which the child is affected by his relationship with his family and this might affect their psychological and developmental needs. The first two questions were from the (SCARED) [4] scale which are: "I worry that something bad might happen to my parents" and it has been changed to "does your child worry that his/her guardians will get infected with

Covid-19" to fit the research purpose. This question can determine the possibility if a child's thinking focuses on losing his/her parents which may lead to increased anxiety level. The second question was "I don't like to be away from my family" and it has been changed to "does your child like to be away from his parents" to figure out if there is a possibility that the child develops separation anxiety or not. Family factor variables are: the number of people living with the child is socially distant during this pandemic (excluding the parents) because the greater number of people would increase the anxiety level score as well as positive PCR test in a family member.

The seventh section is for the activity level factor, to measure the extent to which the child's activity was affected during the pandemic; it can lead to an increase in anxiety. The variables included are the first question was "what is the approximate size of your home (in square meters)" [3] were it changed to "the approximate size of a child's home"; the outdoor activity time the child spent every day; the time the child spends watching TV, playing games, and using the internet during the week. All these variables would

determine the activity level made by the child and its association with anxiety.

The final section was for the NRS and the CAQ scales. The NRS was used to assess the anxiety level. It has an 11-point scale that is scored from 0 to 10. Wherein 0 was 'calm', and 10 meant 'very anxious'. Mild anxiety: 1, and 2; moderate anxiety: 3, 4, 5, 6, 7; and intense anxiety: 8, 9, and 10. For calculating the CAQ scores, 4 questions have been asked on the extent to which children's feel 1. Happy, 2. Calm, 3. Worried, 4. Tensed. We have coded the responses in the following way's: Happy/ calm > little bit (3), middle (2), a lot (1) and Tense/ worried > little bit (1), middle (2), a lot (3), which a score of 4 indicates no anxiety and 12 indicates highest level of anxiety. Moreover, the guardians were requested to ask their children to answer this section's questions and let them express their own feelings.

*** Data collection**

Three experts in the field of study have tested the survey questionnaire for its content validity. Accordingly, the necessary modifications for more clarity were done. In addition, a survey questionnaire was examined to test the

reliability using Cronbach's Alpha coefficient test to measure the internal consistency of the tool. A pilot study was carried out on 10% of the studied sample in order to test the applicability and the clarity of the included tools. The pilot was also served to estimate the time needed for each subject to fill in the questionnaire. Accordingly, necessary modifications have been done. The survey questionnaires were completed using their smartphones, tablets with an Internet connection. It was distributed through social media platforms. The questionnaire was constructed by using Google form. The data collection period took place from 16th March 2021 until 26th March 2021.

*** Data Analysis**

Data have been analysed using the SPSS program, version 22, and Spearman's rank correlation was tested (as data are in ordinary level) and p-value used to test the hypothesis validity. The pilot test was carried out. The data analysis was carried out by the researchers with the guidance of the researcher's supervisor to come up with reasonable conclusions.

*** Ethical consideration**

Participants were told that submission of the completed online

survey questionnaire will be construed as implied consent, indicating that you agree to participate in the study. Confidentiality is also one of the main concerns to the researchers and participants. Their privacy right was respected and any data they provided were kept in the strictest confidence. Ethical approval was obtained from the university. The researchers had sought to collect and access information from volunteering participants and completely protect their anonymity. Participants were told that they have the right to withdraw from the study at any time. After collecting data, the survey questionnaires were stored, nobody can access, except the research team.

*** Results**

At first, the descriptive statistics was conducted to find out the details on every section of the questionnaire and the weight of the categories in each of these sections. It includes frequency and percentage. Then, the anxiety level was checked and distributed in each of the age categories ranging from 6-12 years old. Male participants were 29.18% and female participants were 42.49%. All results were presented in a cross-tabulation method. To find out

the relationship among the factors and anxiety scale.

*** Descriptive of demographic factors**

Socio-demographics of guardians and their children. Most of the respondents of the questionnaire were mothers of children who earn an income of medium range. Nearly half of the respondents' children are female (42.49%). Most of the children were 6 and 12 year old with a percentage of (17.28%) and (19.26%) respectively. Most of the children are with both of their father and mother. Most of the children do not have any chronic disease. Children on average remain (1-2) hours in social distance. It has been noticed that children understand the situation we are going through.

*** Descriptive of education, family, and activity level factors**

We have analyzed the family, education, and activity level factors. From the analysis, it appeared that children interact with teachers and classmates during the online classes. This is quite a positive sign but parents also think that their children require monitoring when taking online classes.

In the family factor, it initiated that children were somewhat worried about their guardian. They fear that their guardian will get infected with

COVID-19. Naturally, children want to stay with their parents in this situation. In addition, an average of 3 to 4 people living with the child were socially distant during this pandemic excluding the parents. Luckily, the majority of them responded that in their house nobody has a suspected or confirmed diagnosis of COVID-19. Furthermore, the majority of the respondents reside in a medium size house. Children on average spent less than an hour in outdoor activities as a pastime but they spent nearly 3 to 4 hours per day watching TV, playing games, and using the internet. It is quite concerning for their mental and physical health.

*** Descriptive of anxiety level of children**

The majority of the children were moderately happy and peaceful. Also, they feel tension and nervous at a very low quantity. Though children were interacting quite well in the online classes, as they prefer classroom-based schooling. Most of the children do not feel anxiety according to the NRS scale with a frequency of (55) for the category 0. According to the CAQ scale, most children felt a low anxiety level.

*** Cross tab for age and anxiety score**

Distribution of anxiety among the age groups

*** NRS**

Table 01: Cross tabulation of age and NRS score

Age		NRS score										Total
		0	1	2	3	4	5	6	7	8	10	
6	Count	15	12	7	5	4	3	2	0	2	1	41
	% of Total	5.93%	4.76%	2.77%	1.98%	1.56%	1.20%	0.79%	0.00%	0.79%	0.40%	24.11%
7	Count	6	7	4	4	0	3	3	1	0	2	30
	% of Total	2.4%	2.8%	1.6%	1.6%	0.0%	1.2%	1.2%	0%	0.0%	0%	11.8%
8	Count	6	2	1	1	7	4	2	2	3	1	29
	% of Total	2.37%	0.79%	0.40%	0.40%	2.77%	1.58%	0.79%	0.79%	1.19%	0.40%	11.60%
9	Count	4	2	3	4	1	1	3	0	0	0	28
	% of Total	1.6%	0%	1.2%	1.6%	0.40%	0.40%	1.2%	0.0%	0.0%	0.0%	10.5%
10	Count	2	3	5	1	2	4	1	2	0	0	20
	% of Total	0.79%	1.19%	1.98%	0.40%	0.79%	1.58%	0.40%	0.79%	0.00%	0.00%	7.91%
11	Count	4	2	2	2	2	1	5	1	0	0	19
	% of Total	1.6%	0%	0%	0%	0%	0%	2.0%	0%	0.0%	0.0%	7.5%
12	Count	10	4	8	4	9	3	3	1	1	8	68
	% of Total	7.11%	1.58%	3.10%	1.58%	3.50%	1.19%	1.19%	0.40%	0.40%	3.10%	26.83%
Total	Count	55	32	30	21	31	34	19	11	6	12	251
	% of Total	21.54%	12.63%	11.95%	8.38%	12.38%	13.44%	7.51%	4.38%	2.37%	4.76%	100.00%

The above table (1) shows that for children aged 6, they scored so little considering the value 0 of the scale. The frequency is 15. For the same age category if we look for the value 10, it gets a frequency of only 1. However,

when investigating the age category 12, it appears that category 0 has a frequency of 18, which is the highest. Furthermore, when investigating the scale value 10, a frequency of 8 is performing, which is also highest when it considers all age groups. Therefore, it seems that the anxiety level increases as age increases.

*** CAQ**

Table 02: Cross tabulation of age and CAQ score

Age		CAQ score										Total
		4	5	6	7	8	9	10	11	12		
4	Count	4	18	14	11	9	2	1	0	0	0	41
	% of Total	9.8%	41.1%	31.9%	24.4%	20.2%	4.7%	2.3%	0.0%	0.0%	0.0%	100.0%
7	Count	3	4	6	7	4	1	1	0	0	0	26
	% of Total	12%	12%	24%	28%	16%	4%	4%	0%	0%	0%	118%
8	Count	2	3	7	8	6	1	2	0	0	0	29
	% of Total	6.9%	10%	23.7%	24.1%	17.2%	2.9%	5.8%	0.0%	0.0%	0.0%	114.6%
9	Count	6	2	3	5	4	1	1	2	0	0	26
	% of Total	24%	8%	12%	20%	16%	4%	4%	8%	0%	0%	103%
10	Count	3	3	10	6	1	0	2	0	1	0	26
	% of Total	11.5%	11.5%	38.5%	23%	3.8%	0%	7.7%	0%	3.8%	0%	103%
11	Count	3	3	6	4	0	1	1	0	1	0	19
	% of Total	12%	12%	24%	16%	0%	4%	4%	0%	4%	0%	76%
12	Count	8	9	14	8	9	7	6	3	2	0	66
	% of Total	12.1%	13.6%	21.2%	12.1%	13.6%	10.6%	9.1%	4.5%	3%	0%	264.8%
Total	Count	29	46	60	45	31	11	14	7	4	201	

	% of Total	11.46%	18.18%	23.72%	17.76%	11.46%	5.14%	6.32%	2.72%	1.59%	100.00%
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Here, in the above table (2), children of age group 6 have a frequency of 4 for the scale value 0. But for the scale value 10, it is 0. For the age group 12, scale value 0 has a frequency of 8, which is the highest for the scale value 0. But for the scale value 10, the frequency is 2, which is the highest for the scale value 12. Here, we can see a large spread. The CAQ score provides a consistent result to that of the NRS. Therefore, it appears that as age increases, the anxiety level also increases.

*** Correlation between anxiety score and the factors**

Table 03: Correlation between factors and anxiety score

Factors	Items	Anxiety score	r value	P value
Education	1- Does your child interact with teachers and classmates during online classes?	NRS score	.179**	.004
		CAQ score	.156*	.013
	2- Do you think your child requires monitoring when taking online classes?	NRS score	.013	.833
		CAQ score	-.012	.844
Family	1- Does your child worry that his/her guardians will get infected with COVID 19?	NRS score	.176**	.005
		CAQ score	.064	.310

	2- Does your child like to be away from his parents?	NRS score	.231**	.000
		CAQ score	.205**	.001
	3- How many people living with the child are socially distant during this pandemic (excluding the parents)?	NRS score	-.027	.670
		CAQ score	-.048	.451
4- Is anyone in the house suspected or confirmed diagnosis of COVID-19	NRS score	-.152*	.016	
	CAQ score	-.018	.781	
Activity level	1- What is the approximate size of your home?	NRS score	-	.000
		CAQ score	-.194**	.002
	2- How long is the outdoor activity time of your child every day?	NRS score	-.035	.578
		CAQ score	-.084	.182
	3- How much time does your child spend watching TV, playing games, using the internet during the week?	NRS score	.168**	.007
		CAQ score	.083	.187
According to the NRS - As the children's interaction with the teacher and classmates decreases, their anxiety level rises. - With the increase of the worry for the guardian of getting infected increases, the anxiety level increases. - As willingness to stay away from parents' increases, the anxiety level increases.		According to the CAQ - As the children's interaction with the teacher and classmates decreases, their anxiety level rises. - As willingness to stay away from parents'		

- As the number of family members diagnosed with COVID-19 increases, the anxiety level increases. - Small houses cause greater anxiety levels. - As the frequency of watching TVs, playing games, and using the internet increases, so does the anxiety level.	increases, their anxiety level increases. - Small houses cause greater anxiety levels.
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* Discussion

In the present study, most of the children revealed low levels of anxiety scores in Jeddah city according to the NRS scale with the frequency of (55) for category 0 and a percentage of (15.58%). According to the CAQ scale, the majority of children feel low anxiety with a frequency of 60 and a percentage of (17%). Compared to previous research, the prevalence of anxiety among Brazilian children was between a percentage of 19.4% (n= 56), using the CAQ, and a percentage of 21.8% (n= 63) using the NRS scale[3].

Nearly half of the respondents' children who lived in Jeddah city were females (42.49%) (n=150) and (29.18%) (n=103) were males, comparing to a Brazilian study, the respondent's children (54.3%) (n= 157) were females, and (45.7%) (n= 132) were males [3]. Most of the children are in social distancing with both their

father and mother (40.79%) (n= 144). Similar to the other study, most of the children (45.7%) (n= 132) were socially distant from both parents [3]. Children on average remain one to two hours in social distance. In contrast to other studies, the hours spent on social distancing was 22 per day [3]. Also, the study showed that (28.05%) (n= 99) of the children understand much of the situation that we are going through. And who chooses the understanding level it's ok; have a percentage of (29.18%) (n= 103). And those who understand a little bit have a percentage of (11.90%) (n=42) and those who don't understand anything have a percentage of (2.55%) (n= 9). In comparison, nearly sixty percent (58%), (n= 168) of the guardians reported that their children understood the actual pandemic situation relatively well [3]. Female children have higher anxiety according to the NRS scale 4.3% (n= 11) and male are (0.4%) (n= 1), according to the CAQ scale, male children have higher anxiety score (1.2%) (n=3) and the female (0.4%) (n= 1).

In another study, greater levels of anxiety were also exhibited by females than males. According to CAQ (CAQ \geq 9), the prevalence of anxiety

was (19.4%) (n = 56). For females, the prevalence was (21%) (n = 33) and for males (17.4%) (n= 23), without statistical difference. The prevalence of anxiety according to NRS (NRS > 7) was (21.8%) (n = 63), and there were no statistically significant differences in the prevalence between the girls (22.3%) (n = 35) and boys (21.2%) (n = 28) [3,9]. Data were analyzed in three factors that have been used in this study which are: family, education, and activity level factors. However, from the analysis, it appears that children were interacting with their teachers and classmates during the online classes. Compared to a study that conducted upon all school-age children in China, (50%) of them believed that monitoring was an essential part and one of the requirements during online classes [14]. Children on average (29.75%) (n= 105) spend less than an hour in outdoor activity per day as a pastime. In other studies, among students, (82%) reported having less than two hours of outdoor activity per day [14]. Though children are interacting quite well in the online classes with (49.58%) prefer classroom-based schooling. Compared to the study conducted in China, they found that (83.5%) of the student's

preferred classroom-based schooling to homeschooling and other schooling styles [14]. With the increase of the worry for the guardians of getting infected so does the anxiety level of the children increases. Another interesting result in the present study showed the opposite: parent's situation related to COVID-19, and the children's age and sex were not related to the children's anxiety and depressive symptoms [9].

*** Limitation / Recommendations**

There are several limitations to this study. First, the data collection took place online. This could exclude the participants who lacked the basic computer abilities to access the survey, and there was likely a selection bias due to the survey's distribution via social media interpersonal relationships. Second, the researchers did not look into how many children lived in the same house. Third, there was no objective assessment of the children's comprehension; instead, adult respondents were asked for their subjective assessment of the amount to which the children comprehended the pandemic, considering age. Consequently, applying the findings to Jeddah city population should be done with caution. The final limitation was that the data was limited and was not

distributed widely to other regions in Saudi Arabia.

It is recommended that future research be done to gain more knowledge about the children's anxiety level to make interventions to have a healthier mental status of the children during the COVID-19 pandemic. Also, It is preferred if the data were collected from a large sample size and more regions in Saudi Arabia. It also recommended for the study to contain the mental health aspect because it has an essential role in a healthy lifestyle during the COVID-19 pandemic period. Children should increase their interaction with their teacher's during the online classes. Mental support should be given to the children in case someone in the house gets diagnosed with COVID-19 also in case children get worried that their guardian would get infected. Children should stay with their parents to grow up in a safe and good environment. In addition, the size of the home should be moderate according to the number of family members. Children should get more involved with outdoor games and reduce watching TV, playing games, and using the Internet. The above measures must be drawn under consideration and should be applied to

maintain a well-managed interaction with the surroundings. Finally we have answered our research question.

* **Conclusions**

This research aimed to affect professional nursing practice by advocating for our patient's physical and mental health as it is considered one of the main nursing roles. Therefore, it must be understood that the effects of anxiety levels, and to what degree they can affect children; to protect those who do not have the ability to defend themselves as they need a caregiver besides them. Nurses' roles are not the only advocate but also educators and consultants to guide them and answer their questions and concerns. Since people tend to fear the unknown/unfamiliar situations we must educate them and raise their awareness level, and knowledge about the Covid-19 pandemics, and take into consideration its essential precautions.

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