

# The Knowledge and Attitudes about the Benefits, Risks and Use of Medicine in Aged Primary Students in Indonesia

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## Abstract

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**Abbreviations:** CHC: chronic hepatitis C; NS: not statistically significant; S: statistically significant; BMI: body mass index; AST: aspartate transaminase; ALT: alanine aminotransferase; HDL-C: high-density lipoprotein cholesterol; LDL-C: low-density lipoprotein cholesterol; HOMA-IR: Homeostasis Model Assessment of Insulin Resistance. a(Chi-square test) b(Student t-test) c(Mann-Whitney test)

**BACKGROUND:** Medication always has a ratio of benefits and risks to become a safety measure. Therefore, its use must be careful, especially for children, because it can potentially occur drug incidents in children. As drug users, children are required to be active in using it, but children's knowledge and attitudes about benefits, risks (dangers) and use of medicine are still very shallow and fragmented.

**AIM:** This study aims to look at the description of children's knowledge and attitudes about medicine from the perspective of the benefits, risks or dangers and use of medicine and the factors that influence them.

**MATERIAL AND METHODS:** The study was conducted by the analytic method with a cross-sectional approach using a questionnaire instrument in grade V elementary school-age children in Padang City, Indonesia. The total sample size obtained was 503 students.

**RESULTS:** The results showed that children's knowledge of medicine was generally categorised as low, with an average score of 4.70 (SD 1.82) from a scale of 9. Knowledge of drug use was much lower, namely the average score of 1.21 (0.74), followed by knowledge of drug hazards an average score of 1.69 (1.03) and drug benefits an average score of 1.80 (0.69). Age variables, address of residence, family income, the existence of families working as health workers and sources of drug information significantly influence students knowledge ( $P < 0.05$ ). Whereas students attitudes towards medicine tend to be more positive with an average score of 7.18 (1.77), where the average score of attitudes towards benefits, risks (hazards) and drug use are 1.79 (0.46), respectively, 1.10 (0.58) and 4.29 (1.37). Address of residence, companion during illness, achievement in school and experience in hospital care have a significant effect on student attitudes ( $P < 0.05$ ).

**CONCLUSION:** This study concluded that indicate that students knowledge of benefits, risks and use of medicine is still low and very limited. While related to student attitudes, in general, it tends to be more positive, except about the dangers of medicine that show a negative attitude. The low level of knowledge and limited attitudes of children are the reason for the need for drug education given to children, especially in schools as an integral part of health education.

## Introduction

Medication always has a ratio of benefits and risks to become a safety measure. Therefore, its use must be careful, especially for children. This is due to among others due to variations in size, physiological limitations and communication barriers in children. As a result, it can potentially occur drug incidents in children [1], [2]. The incidence of this drug can be the occurrence of various problems related to medicine (DRP). The most common DRP in children is in the form of poisoning, non-compliance with medication,

adverse drug events (ADE) and improper drug use [3], [4].

The occurrence of poisoning can occur due to many factors. In the United States reported in 2015, there were more than 440,000 calls (about 1 call per minute) because the child who swallowed medicine (unintentional general exposure), was given too much medication or received the wrong medication (unintentional therapeutic error) [5], [6]. In 2014 there were 57,448 children under the age of 6 who were admitted to the ER due to medication problems without supervision or as a result of dosing errors. About 16% of this is severe poisoning that causes

death [6], [7].

The accidental use of children for certain medicine is due to the child's perception of being mistaken about medicine. Tablets that are coloured like pink can be mistaken for candy by children [8]. Therefore, drug safety in children must be a serious concern. Moreover, the use of medicine has become a common activity for children both through prescribing and self-medication [9], [10].

Studies show that the practice of self-medication using over the counter (OTC) medicine, especially the analgesic group in children, has begun at the age of 11 or 12 years [11], [12]. In Finland, children under 12 years old have practised self-medication, especially the use of vitamins [3]. In Denmark, children aged 11-15 years are used to practising self-medication for minor ailments, especially for headaches and gastric disorders [10]. The same thing happened in 20 countries surveyed that the prevalence of the use of OTC medicine especially headache medicine in children aged 11-15 years is increasing even some of them are toxic so that they can be problematic for health [13].

On the one hand, as drug users, children are required to have an active role [14]. But on the other hand, their knowledge and attitudes regarding medicine are still very limited and fragmented [8], [15], [16], [17], [18], [19]. Children's knowledge about medicine is obtained only from their daily experiences [8], [19]. While it is related to children's attitudes towards medicine, several studies show that children's attitudes are generally negative towards medicine such as the fear of taking medication, not adhering to taking medication or even taking excessive medication because of the sweetness of the drug syrup [19]. But in several other studies, children also showed positive attitudes to medicine [20], [21].

Based on the above, it is very important to teach children about medicines at school so that children can receive correct and complete information about medicine. With this drug education, children will be prepared to become rational drug users when they grow up and at the same time are expected to be agents of change in rational drug use for their families at home.

Children in different cultures in all countries of the world usually have similarities in what they know about medicine [22]. Indonesia, as a country with the largest population in the world, including the age group of its children is likely to have the same tendency in terms of knowledge and attitudes about medicines as in previous studies. However, studies and data have not been found that illustrate how the level of knowledge and attitudes of children about medicine is mainly related to the problems of the benefits and risks or dangers of medicine and their use.

This study aims to look at an overview of the

knowledge and attitudes of elementary school-age children (class V) about medicine from the perspective of the benefits, risks or dangers and drug use by children in Indonesia, especially in the city of Padang and what factors influence it.

## Material and Methods

This study was a cross-sectional survey conducted from June to July 2018 in the city of Padang, West Sumatra, Indonesia. The sample chosen was class V elementary school age, children. The location of the study was conducted in 10 (ten) elementary schools spread over 3 (three) sub-districts namely North Padang, South Padang and Bungus Teluk Kabung.

The number of samples taken was 503 people. Sampling uses the stratified random sampling method. The first stage in the form of school selection uses a probability proportional to size (PPS) method, which is based on a database of the number of elementary school students in the sub-district as a size that is used as the basis for opportunities in selecting samples. From selected schools, student samples were selected using the simple random sampling method.

The selected school received prior permission from the Padang City Education Office, West Sumatra. Then an official letter is submitted through the Chair of the Public Health Study Program, Faculty of Medicine, Andalas University to each selected school. Before starting the study, ethics approval was first requested from the Ethics Committee Faculty of Medicine, Andalas University, Padang. Each parent of the student selected as a sample was also asked for his consent to permit his child to be included in this study.

This research is in the form of a quantitative study using an instrument in the form of a closed questionnaire to see the knowledge and attitudes of elementary students about medicine. This questionnaire is based on previously modified similar research adapted to conditions in Indonesia [15], [16], [17], [18], [20], [24], [25]. This questionnaire consists of 3 parts, namely the first part contains the sociodemographic characteristics of the respondents; the second part contains aspects of knowledge, and the third part contains aspects of attitude. Each part of knowledge and attitude consists of 3 categories, namely drug benefits, risks or dangers of medicine and drug use. In the knowledge section, the answers consist of yes, no and don't know. Likewise, in the attitude section, answers consist of agreeing, disagreeing and not knowing. For each correct answer given a score of 1 and the wrong or not knowing given

a score of 0. The draft questionnaire that has been prepared asked for opinions of community pharmacists and clinical pharmacy related to the content validation and then validation test for 30 elementary students. Before the research began, the research team who served as enumerators were gathered to be given training on how to collect data on students. Filling out questionnaires by students is done in the classroom with the help of enumerators. Completing this questionnaire takes about 30 minutes.

The collected data is coded and then sent to the SPSS database for Windows version 21. Univariate analysis (descriptive) includes frequency, percentage, average and standard deviation. Bivariate analysis between dependent variables (knowledge and attitudes about medicine) and independent variables (respondents sociodemographic characteristics) were determined using the Chi-Square test. The level of significance was set at  $p < 0.05$ .

## Results

The sociodemographic characteristics of respondents in this study, as presented in Table 1. Respondents were generally 10-11 years old (73.4%), male sex (52.3%) and 43.3% had received achievement 10 (ten) big at school. Respondents mostly resided in the city centre, namely in North Padang and the middle area in South Padang (80.0%). 48.1% of families have a moderate income, and as many as 32.6% have families working in the health sector. Mothers are people who always accompany children when they are sick (85.3%), and only 24.7% say they have been hospitalised. For drug information, children generally state that they get it from their parents (66.6%).

**Table 1: Sociodemographic characteristics of children's**

Sociodemography of respondents	Variables	Amount	%
Age	10 – 11	369	73.4
	12 – 14	134	26.6
Gender	Female	240	47.7
	Male	263	52.3
Residence	North Padang	201	40.0
	South Padang	201	40.0
	Bungus Teluk Kabung	101	20.0
Family income	< Rp 2.500.000	197	39.2
	Rp 2.500.000 – 5.000.000	242	48.1
	> Rp 5.000.000	64	12.7
The family as health workers	Exist	164	32.6
	Nothing	339	67.4
Companion during illness	Father	46	9.1
	Mother	429	85.3
Sources of drug information	Another brother	28	5.6
	Parents	335	66.6
	Friends / others	14	2.8
	School teachers	48	9.5
	Drug advertisements in newspapers	10	2.0
Feat	Drug advertisements on TV	67	13.3
	Internet	29	5.8
	Top 10	218	43.3
Have been treated in a hospital	Does not make top 10	285	56.7
	Ever	124	24.7
	Never	379	75.3

Questionnaire results related to student's knowledge of medicine, in general, can be seen in Table 2. This knowledge questionnaire is categorised into 3 types, namely about the benefits of the drug, the risk or danger of the drug and the use of the drug itself. In the category of drug benefits, almost all children (94.6%) stated that the drug should be taken when sick. However, children's knowledge about the types of medicine associated with the benefits is still low. As many as 40.0% of children stated that the same drug could be used for all ages and only 25.6% of children could answer correctly that the same drug could be used to treat different diseases/symptoms.

It is also related to knowledge about the risks/dangers of medicine where the results are also low. Of the three questions about the dangers of medicine, the lowest answers were found on drug side effects, where only 42.5% of children knew that medicine could cause side effects. Likewise, with the types of medicine that cannot be used for all ages, only 61.8% answered correctly, and 64.2% of children knew that medicine could cause poisoning if the use were not right. Low knowledge is also shown in questions about drug use. Generally, children (90.9%) children state that the drug should be minimum after eating. Regarding the storage of medicine, around 56.7% of children agreed that medicine should not be stored in the refrigerator. Some 56.1% of children also answered correctly that heat and sunlight could damage medicine.

**Table 2: Children's knowledge about medicine**

No	Questions	Respondents	
		Correct answer	Total (%) correct answer
<b>Benefits of medicine</b>			
1	When we are sick, we have to take medicine	Yes	476 (94.6)
2	The same medicine can be used for all ages	No	302 (60.0)
3	The same drug can be used to treat different diseases/symptoms	Yes	129 (25.6)
<b>Risk/danger of medicine</b>			
1	Some medicine may not be used by children	Yes	311 (61.8)
2	Some medicine can cause unwanted things like allergies/itching on the skin	Yes	214 (42.5)
3	Some medicine if used not according to the rules, can cause poisoning	Yes	323 (64.2)
<b>Drug use</b>			
1	The drug should be used after meals	No	46 (9.1)
2	Medicines should be stored in the refrigerator	No	280 (56.7)
3	Heat and sunlight can damage medicine	Yes	382 (56.1)

From the three categories above, it can be obtained that overall children's knowledge of medicine is still low, as shown in table 3. The average scores obtained for each of these categories are 1.80, 1.69 and 1.21 of scale 3. If combined these three categories, the average knowledge score of children is 4.70 from scale 9 or around 52.22% and this includes the low category

**Table 3: Average score of answers to questions about children's knowledge**

Variables	Minimum score	Mean (SD)	Maximum score	Total score	The mean of the total score
Benefits of medicine	1	1.80 (0.69)	3	3	60.00
Risk / danger of medicine	1	1.69 (1.03)	3	3	56.33
Drug use	1	1.21 (0.74)	3	3	40.33
Total	1	4.70 (1.57)	9	9	52.22

Table 4 shows the relationship between sociodemographic characteristics and respondents' knowledge. The results of the analysis using the chi-square test obtained several variables that were significantly related ( $P < 0.05$ ).

These variables are age, area of residence, family income, the presence or absence of families working in the health sector and sources of information on medicine obtained. Whereas related to children's attitudes about medicine (Table 5), as well as the knowledge above, are also categorised into three types.

First, children's attitudes related to the problem of the benefits of the drug have positive results. 95.0% of children agree that the drug is very useful to cure disease, and 84.1% of children are not afraid to take medication.

Instead, the second attitude about the risks/dangers of medicine is even more negative. A total of 81.49% of children did not agree to take the same medication as adults to get well soon. However, only 28.0% agreed that medicine could have adverse effects on health.

**Table 4: The relationship of sociodemographic with the knowledge of the respondent**

No.	Variables	Mean (SD)	Median (min-max)	P-value
Age	10-11	5.05 (1.82)	5 (1-8)	0.000
	12-14	4.35 (1.74)	4 (1-9)	
Gender	Female	4.72 (1.80)	5.0 (1-9)	0.088
	Male	5.00 (1.84)	5.0 (1-8)	
Residence	North Padang	5.35 (1.82)	5.0 (1-8)	0.000*
	South Padang	4.56 (1.76)	5.0 (1-9)	
	Bungus Teluk Kabung	4.52 (1.75)	4.0 (1-8)	
Family income	< Rp 2.500.000	4.58 (1.72)	4.0 (1-9)	0.008
	Rp 2.500.000 – 5.000.000	5.00 (1.87)	5.0 (1-8)	
	> Rp 5.000.000	5.22 (1.83)	5.0 (2-8)	
The family as health workers	Exist	5.19 (1.84)	5.0 (1-9)	0.004
	Nothing	4.71 (1.79)	5.0 (1-8)	
Companion during illness	Father	4.93 (1.85)	5.0 (1-8)	0.525
	Mother	4.88 (1.82)	5.0 (1-9)	
	Another brother	4.50 (1.86)	4.0 (1-8)	
Sources of drug information	Parents	4.92 (1.72)	5.0 (1-9)	0.010
	Friends / others	3.36 (1.45)	3.0 (2-7)	
	School teachers	4.90 (1.59)	5.0 (2-8)	
	Drug advertisements in newspapers	4.30 (1.49)	4.0 (3-7)	
Feat	Drug advertisements on TV	5.15 (1.59)	5.0 (1-8)	0.436
	Internet	5.03 (1.80)	5.0 (2-8)	
	Top 10	4.94 (1.84)	5.0 (1-8)	
Have been treated in a hospital	Does not make top 10	4.81 (1.81)	5.0 (1-9)	0.370
	Ever	4.98 (1.74)	5.0 (1-8)	
	Never	4.83 (1.85)	5.0 (1-9)	

Furthermore, students' attitudes about drug use look more positive. Of the six questions, five of them behaved correctly with the percentage of answers agreeing to be greater than 60%.

Only the attitude about the need to wait for parents first when taking medicine is answered with a statement of disagreement that is as much as 51.7%.

Overall, from the attitude aspect it can be shown in Table 6 that children's attitudes about benefits, the risks/dangers of medicine and their use are more positive with an average score of 7.18 in a scale of 10 or 71.77%, although for the hazard category children tend to be negative with an average score of 1.10 on a scale of 2 or 55.0%.

**Table 5: Children's attitudes towards medicine**

No	Statements	Respondents	
		Correct answer	Total (%) correct answer
<b>Benefits of medicine</b>			
1	The medicine is very useful to cure diseases	Agree	478 (95.0)
2	I am not afraid or anxious about taking medicine	Agree	423 (84.1)
<b>Risk/danger of medicine</b>			
1	I want to take the same medicine taken by an adult, to quickly recover	Disagree	412 (81.9)
2	Medicine can give a result that is bad for health	Agree	141 (28.0)
<b>The use of medicine</b>			
1	When will take medicine when sick; I want to drink a lot of medicine to recover	Disagree	316 (62.8)
2	I always wait for parents when taking medicine	Agree	260 (51.7)
3	When will be drunk medicine by parents/family; I would ask you first to the parents/family about what medicine I drink it	Agree	401 (79.7)
4	When will be drunk medicine by parents/family; I would ask you first to the parents/family how much medicine I was taking it	Agree	385 (76.5)
5	When will be drunk medicine by parents/family; I would ask you first to the parents/family about how many times a day should be taking the medicine	Agree	430 (85.5)
6	I can get information about the storage of label drug/drug packaging	Agree	364 (72.4)

The results of the analysis with the chi-square test to see the relationship between the characteristic variables and the attitude of the respondents (Table 7) obtained the existence of several variables that were significantly associated ( $P < 0.05$ ).

**Table 6: The average score of answers to questions about the attitudes of children**

Variables	Minimum score	Mean (SD)	Maximum score	Total score	% the mean of the total score
Benefits of medicine	0	1.79 (0.46)	2	2	89.50
Risk / danger of medicine	0	1.10 (0.58)	2	2	55.00
The use of medicine	0	4.29 (1.37)	6	6	71.50
Total	0	7.18 (1.77)	10	10	71.77

These variables are a place of residence, companion during illness, achievement in school and experience having been treated in a hospital.

**Table 7: Sociodemographic relationships with children's attitudes**

No.	Variables	Mean (SD)	Median (min-max)	P-value
Age	10-11	7.27 (1.73)	8.0 (2-10)	0.098
	12-14	6.92 (1.87)	7.0 (2-10)	
Gender	Female	7.07 (1.95)	7.0 (2-10)	0.417
	Male	7.28 (1.59)	8.0 (2-10)	
Residence	North Padang	7.34 (1.72)	8.0 (2-10)	0.049*
	South Padang	6.92 (1.83)	7.0 (2-10)	
	Bungus Teluk Kabung	7.36 (1.72)	8.0 (2-10)	
Family income	< Rp 2.500.000	7.22 (1.80)	8.0 (2-10)	0.841
	Rp 2.500.000 – 5.000.000	7.16 (1.70)	8.0 (2-10)	
	> Rp 5.000.000	7.11 (1.98)	7.0 (2-10)	
The family as health workers	Exist	7.32 (1.84)	8.0 (2-10)	0.081
	Nothing	7.11 (1.74)	7.0 (2-10)	
Companion during illness	Father	6.74 (2.24)	7.0 (2-10)	0.000
	Mother	7.34 (1.64)	8.0 (2-10)	
	Another brother	5.46 (1.91)	5.0 (2-9)	
	Parents	7.35 (1.66)	8.0 (2-10)	
Sources of drug information	Friends / others	6.14 (2.60)	6.0 (2-10)	0.144
	School teachers	7.00 (1.75)	7.0 (3-10)	
	Drug advertisements in newspapers	7.10 (1.59)	7.0 (4-9)	
	Drug advertisements on TV	6.91 (2.02)	7.0 (2-10)	
Feat	Internet	6.65 (1.88)	7.0 (3-9)	0.012
	Top 10	7.33 (1.81)	8.0 (2-10)	
	Does not make top 10	7.06 (1.73)	7.0 (2-10)	
Have been treated in a hospital	Ever	6.79 (1.97)	7.0 (2-10)	0.031
	Never	7.30 (1.69)	8.0 (2-10)	

## Discussion

In this study, the sample is children of grade V

elementary school students. The selection of class V students is because children in this class have relatively stable behaviours and beliefs about health [23] and good communication skills. The selection of the three sub-districts in this study was based on the representation of the sociodemographic characteristics of Padang City where North Padang represented the downtown area, South Padang represented the middle region, and Bungus Teluk Kabung represented the periphery. These sociodemographic characteristics can, at the same time, show the socio-economic status (SES) of the community. The downtown area describes the high category SES, the middle region as the middle category SES and the peripheral area as the low SES category. Previous research shows that SES variables are one of the factors that influence children's knowledge [16], [20], [24].

The results of this study show that children's knowledge, in general, is still categorised as low and fragmented. This result is in line with all existing research related to children's knowledge where limited and fragmented knowledge is obtained [8], [15], [16], [17], [18], [19], [21].

The low level of children's knowledge is very reasonable because so far children only get it from their daily experience from observing medicine that have been used alone or from families who use medicine [8], [16], [17], [18], [19]. This is reinforced by drug information sources obtained by children generally from parents (66.6%). Only around 9.5% is obtained from teachers in schools. The results of this study are in line with previous studies [16], [17], [18].

Knowledge about medicine can be influenced by personal factors (age and internal control locus degrees) and environmental factors, namely the educational environment (SSE). The existence of drug advertisements does not influence knowledge but can only increase perceptions in children that medicine are beneficial [26].

In terms of age, previous studies showed that children aged 10-11 years had a better knowledge of elementary students ages 6-7 and 8-9 years [16]. The higher the age of the child, the better the child's knowledge [17], [19], [20]. In this study also found a meaningful relationship between age and knowledge. But it is precisely the 10-11-year age group whose average score is higher than the 12-14-year age group. This may be because children aged 12-14 are class-dwelling children who are still in grade V of the elementary school which according to age, children aged 12-14 years are in class VI or VII group.

Students' knowledge is influenced by socioeconomic status (SES) of families where families with high SES knowledge are better compared to families with low SES [16], [20], [24]. In this study, it was found that the same thing that SES affects student knowledge. Students living in the downtown area have better knowledge scores than knowledge

scores on students in the other two regions. Likewise, students who live in the city centre have better knowledge scores compared to students who live in the suburbs.

Medicine are more viewed by children as something useful when sick because medicine can treat diseases, and this is in line with previous studies [15]. This is because children view medicine more as a curative rather than preventive measure [15], [24].

Meanwhile, the concept of risk or danger on medicine is understood if the drug is used improperly (misuse) for example a large number [25], the presence of drug side effects [15] and medicine that have expired (expired date) [17]. Most children acknowledge that medicine can cause harm to the body, such as when taking other people's medications, especially older people, taking the wrong medication or taking medicine for the wrong disease [22]. In this study, it was found that knowledge about the risks or dangers of medicine is quite low, as well as research conducted in India [25].

In this study, only about 42.5% knew that the drug had side effects. Previous research in Spain found 64.9% of children knew that medicine had side effects [17] and in India at 59.6% [18]. While related to the problem of drug poisoning, it was found that 64.2% stated that the drug could cause poisoning if used not according to the rules. In India, it was found that 50% of children stated that the drug was dangerous if the drug was taken in large or incorrect quantities [25].

As age increases, the child's ability to identify potential risks or the dangers of a drug is getting better. Older children are more careful when using medicine from younger children. In the UK, cases of accidentally taking medicine are the main reason why children are taken to hospital. Children under the age of 7 years are the group that has the most potential for the risk of medicine because children generally regard medicine as something good for them [8].

Knowledge about the use of medicine also shows that the child is still superficial, especially knowledge about how to take medicine whether before food or after food. The majority of children said that every medication should be eaten first. Only around 9.1% answered correctly that the drug should not be used after meals. The habit of having to eat before taking medicine seems to have been planted for a long time from parental behaviour. Even though the use of medicine does not have to have to eat first, there are even those who are recommended to take a medication just before eating or on an empty stomach.

Likewise, with knowledge about drug storage. Storage of medicine in the refrigerator may be considered as storing fruits so the child feels the drug should be stored in the refrigerator. Children also don't know very much that heat or sunlight can damage medicine.

To see the relationship between sociodemographic characteristics and respondents' knowledge, statistical analysis was performed using Chi-Square test. The results obtained that there is a meaningful relationship between several variables with knowledge. These variables are age, place of residence, family income, the presence or absence of families working in the health sector and drug information sources.

Related to attitudes, it was found in previous studies that 7-year-old children had begun to learn to develop attitudes towards medicine [19]. Children's attitudes toward medicine can tend to be negative or positive. In this study, it was found that student attitudes in general about medicine tend to be positive. Several other studies show the same thing where children's attitudes about medicine are generally also positive [20] [21]. However, negative attitudes of children were found in the risk category or drug hazard, where only 28.0% of children answered correctly that medicine could have adverse effects on health. This certainly needs to be a concern because children view medicine as something harmless so that there is the potential for the risk of medicine. While other studies show the opposite attitude where children generally have a negative attitude towards the use of medicine such as choosing not to be used if possible [19], this difference in results is possible because of differences in the research methods used by each researcher.

The results of statistical tests using Chi-Square test showed that children's attitudes about medicine were significantly affected by several factors ( $P < 0.05$ ). These factors are residential address factors, companion during illness, achievement in school and experience having been hospitalised.

The results of this study indicate that students 'knowledge of medicines is still low and very limited, even though students' attitudes about medicine tend to be more positive. But the attitude about the dangers of medicine is even more negative. The low level of knowledge and limited attitudes are the reasons for the need for drug education given to children, especially in schools as an integral part of health education.

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