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PREVENTING EARLY CHILDHOOD CARIES: Preventive behavior of mothers in Banjar district, Indonesia

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Abstract

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Early Childhood Caries (ECC) is a serious problem worldwide, and particularly in developing countries such as Indonesia. Mothers are often the major influence on their children's health, which makes them key players in the prevention of disease, including ECC. This paper describes a cross-sectional descriptive study which investigated the factors related to the preventive behavior of mothers regarding ECC, such as their socio-demographic characteristics, knowledge and perception regarding dental caries, and sources of information and social support.

Face-to-face interviews with 300 mothers in Banjar district, Indonesia, whose preschool children were registered in kindergartens or playgrounds during data collection, were conducted to assess how they sought to prevent dental caries in their young children. Informed consents were signed by them prior to the interviews. Data were then analyzed using descriptive statistics and chi-square tests to explore associations between factors commonly associated with ECC and the mothers' preventive behavior.

Study results reveal that more than half of the mothers had poor preventive behavior; nearly two thirds were between 25 and 35 years old; almost half had finished high school; and about two thirds were housewives with average monthly family incomes of 2,759,933 rupiahs (9570.49 Baht). Maternal age, education and occupation were factors which were found to have significant association with mothers' dietary habits for their children. Social support was also found to have a significant association with the regular dental check up aspect.

Nowadays, many wives have to join the workforce, not only for economical reason but also for women's self-achievement. It makes them less able to devote their time to child-rearing. To fill the gap, the role of the preschools and daycare centers is becoming more important. Therefore, the quality of these institutions should be raised to meet the responsibility of achieving better dental health for young children.

Keywords: dental caries, preschool children, mothers, preventive behavior, Indonesia

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การป้องกันฟันผุในเด็กเล็ก: พฤติกรรมการป้องกันของแม่ในอำเภอบันจา ประเทศอินโดนีเซีย

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บทคัดย่อ

ราฮิมายันติ บุญยง เกี่ยวการค้า และจุฑาธิป ศีลบุตร
การป้องกันฟันผุในเด็กเล็ก: พฤติกรรมการป้องกันของแม่ในอำเภอบันจา ประเทศอินโดนีเซีย
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ฟันผุในเด็กเล็กเป็นปัญหารุนแรงโดยทั่วไปในโลกนี้ โดยเฉพาะอย่างยิ่งในประเทศที่กำลังพัฒนา เช่น ประเทศอินโดนีเซีย แม่เป็นบุคคลที่มีอิทธิพลมากต่อสุขภาพของเด็กและทำหน้าที่สำคัญในการป้องกันโรค รวมทั้งฟันผุให้กับเด็กเล็ก การศึกษาเชิงพรรณนาแบบตัดขวางนี้ต้องการค้นหาปัจจัยต่างๆที่สัมพันธ์กับพฤติกรรมการป้องกันฟันผุของเด็กเล็กในกลุ่มแม่ ได้แก่ คุณลักษณะด้านสังคม-ประชากร ความรู้และการรับรู้เกี่ยวกับฟันผุ รวมทั้งแหล่งข้อมูลเกี่ยวกับฟันผุและแรงสนับสนุนทางสังคม

เก็บข้อมูลแบบสัมภาษณ์ซึ่งหน้ากับแม่ที่มีลูกเรียนชั้นอนุบาลหรือที่ศูนย์เด็กเล็ก จำนวน 300 คน ในอำเภอบันจา ประเทศอินโดนีเซีย โดยให้เซ็นต์ชื่อในแบบยินยอมก่อนการสัมภาษณ์ วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนาและทดสอบความสัมพันธ์ระหว่างปัจจัยต่างๆกับพฤติกรรมการป้องกันฟันผุในเด็กเล็กของแม่ด้วยสถิติไคว์สแควร์

ผลการศึกษาพบว่า เกินกว่าครึ่งหนึ่งของแม่มีพฤติกรรมการป้องกันฟันผุที่ไม่ถูกต้อง เกือบสองในสามมีอายุระหว่าง 25 ถึง 35 ปี เกือบครึ่งหนึ่งเรียนสำเร็จชั้นประถมศึกษา และประมาณสองในสามเป็นกลุ่มแม่บ้าน รวมทั้งมีรายได้เฉลี่ย 2,759,933 รูเปียห์ (9,570.49 บาท) ต่อครอบครัวต่อเดือน นอกจากนี้ ยังพบว่า อายุของแม่ ระดับการศึกษา และอาชีพ มีความสัมพันธ์อย่างมีนัยสำคัญกับนิสัยการดูแล (ด้านอาหาร) ลูกของแม่ที่เป็นกิจวัตรประจำวัน แรงสนับสนุนทางสังคมก็มีความสัมพันธ์การนำเด็กเล็กได้ตรวจฟันเป็นประจำ

ปัจจุบันแม่ทั้งหลายต้องทำงานนอกบ้านไม่ใช่เหตุผลทางด้านเศรษฐกิจเท่านั้น แต่ยังรวมถึงความสำเร็จส่วนตัวของผู้หญิงด้วย สิ่งเหล่านี้ทำให้มีเวลาดูแลลูกน้อยลง บทบาทของโรงเรียนอนุบาลและศูนย์ดูแลเด็กเล็ก จึงมีความสำคัญในการปิดช่องว่างนี้ ดังนั้น จึงควรยกระดับคุณภาพของความรับผิดชอบของหน่วยงานดังกล่าวให้บรรลุการมีสุขภาพฟันที่ดีของเด็กเล็ก

คำสำคัญ ฟันผุ เด็กก่อนวัยเรียน แม่ พฤติกรรมการป้องกันฟันผุ ประเทศอินโดนีเซีย

Introduction

Dental caries is the most prevalent oral disease in several Asian countries, particularly as a result of growing sugar consumption and inadequate exposure to fluoride.[1] A high percentage of untreated dental caries in children, known as Early Childhood Caries (ECC), makes it a global 'pandemic' disease.[2] In 2004, the World Health Organization (WHO) noted that the number of Teeth Decayed, Missing due to caries (extracted), and Filled, in terms of the DMFT index for 12- year- old children was 1.61 in 188 countries. This score includes 60 to 90 percent of school children around the globe.[3]

It should be noted that a mother and her young child often share food and eating utensils, and the mother usually blows, pretastes or prechews the child's food.[4] As a chronic and infectious oral disease, ECC remains one of the most common and costly diseases of childhood. It is difficult to manage in the dental practices, and antibiotics, general anesthesia and hospital admission may be required.[5, 6]

As very young children are dependent on their mothers, primary prevention programs which aim to reduce ECC by improving the oral health of mothers are likely to improve the oral health of their offspring.[6] However, a more recent study in Japan (2008) revealed that dental caries was associated more strongly with child-related health behavior than mother-related health behavior.[7] Thus, even though a mother does not have good health behavior, if she pays more attention to her child, then the child will have fewer dental caries problems. It has been suggested that encouraging mothers to have good knowledge about preventing dental caries in child-rearing could result in children enjoying better oral health.[8]

The prevalence of ECC in most developed countries ranges between 1 to 12 percent. On the other hand, it reaches 70 to 90 percent in many developing countries. This disparity is likely due to lack of access to fluoridated water and dental services, and differences in socio-economic status, [6] as is currently the case in Indonesia. According to WHO in 1995, 90.5 percent of preschool children in Indonesia in urban areas and 95.9 percent in rural areas were affected by ECC and had DMFT scores of 7.92 and 7.98 respectively.[3]

The aim of this study was to describe the dental caries preventive behavior of mothers with preschool children in Martapura, Banjar district, Indonesia, and to assess the relationship between socio-demographic characteristics, knowledge, perception, sources of information about dental caries and its prevention, social support, and dental caries preventive behavior of mothers with preschool children.

Methods

This study utilised a cross-sectional design, and data were collected by interviewing mothers with preschool children about their dental caries preventive behavior by using a structured questionnaire. The sample was comprised of 300 mothers with preschool children whose children were registered in a kindergarten or playground during data collection, and who agreed to participate by signing an informed consent.

The study site was in Martapura subdistrict, the capital of Banjar district. This city is the most populous city in Banjar district, with 87,319 inhabitants in 2009. Among them, 6.05 percent were children under five years old. With all the vast economical, social

and educational facilities that this city could offer compared to other cities in this district, Martapura has become the densest city, reaching 2,078 people per square kilometres.[9]

There were 16 kindergartens and 16 playgrounds in Martapura subdistrict. Eight kindergartens and 8 playgrounds were randomly selected as study sites. Based on the proportion to size method, 150 mothers were selected from those 8 kindergartens and another 150 from those 8 playgrounds. Data were collected by 17 trained interviewers in February 2011.

The instrument used for collecting data was a structured questionnaire which contains six parts: Part 1 consists of six questions about socio-demographic characteristics, including age, education, occupation, ethnicity, monthly family income and number of children. Part 2 had 11 questions asking about knowledge of mothers regarding dental caries and its prevention. Based on the number of correct answers, each respondent was scored to judge their level of knowledge about dental caries, based on Bloom's criteria. In the third part, there were 13 statements which covered perceived susceptibility, seriousness, benefit and barrier, to be responded to by the respondents. A Likert scale was used to determine the perception of mothers toward dental caries in their children. The perception of the mothers was then categorized into three levels based on the mean and standard deviation. In part 4, sources of information about dental caries in preschool children and its prevention were ascertained by two questions, which cover mass media andindividuals. In part 5, there were four "Yes-No" questions asking about social support from the mothers' surrounding communities and if these communities supported their dental caries preventive behavior. In the last part, the level of respondents' preventive behavior was scored based on the mean value for seven questions, which asked about mothers' preventive behavior, including oral hygiene, dietary habits and regular dental check ups for their children.

To describe more specifically the respondents' preventive behavior, each criterion was scored separately. One question in the oral hygiene habits part and one question in regular dental check ups part were "yes-no" questions. The answer "yes" was considered as good preventive behavior and answer the "no" was considered as poor behavior. In the dietary habits part, there were five questions which were scored according to their mean value.

A reliability test was performed on the questionnaire before conducting the study with a score of 0.48 (Kuder-Richardson formula) for the knowledge part and 0.71 (Cronbach's alpha) for the perception part. Descriptive statistics were used and further analysis was done by using the chi-square test to describe the relationships between dental caries preventive behavior and the related factors.

Results

Table 1 shows the number and percentage distribution of the socio-demographic characteristics of the respondents. The age of the respondents ranged from 18 to 52 years, and the average age was 30.4 years old. Nearly two-third of them (65.7%) were 25 to 35 years old. With regard to educational background, almost half of the respondents (45.7%) has finished high school, and 19.3% were college or university graduates. Over two-thirds (69.3%) were housewives, while the rest worked as merchants, government or

private employees. Seventy-eight percent of them were Banjarnese, the ethnicity of the original inhibitans of South Kalimantan province, and 18 percent were Javanese, originally from Java Island (immigrants). The respondents' monthly family incomes ranged widely from 200,000 to 20,000,000 rupiahs. The great majority of the respondents (95%) were from the lowest level of income, which was between 200,000 and 6,800,000 rupiahs. Almost half of them (48%) had only one child, and 37.7 percent had two children.

Table 1 Number and percentage of respondents by socio-demographic characteristics

Socio-demographic characteristics	Number (n = 300)	Percent (%)
Age group:		
<25	45	15.0
25 – 35	197	65.7
>35	58	19.3
Mean=30.4 SD=5.9 Min=18 Max=52		
Education		
Primary school	39	13
Secondary school	66	22
High school	137	45.7
College/university	58	19.3
Occupation		
Government employee	40	13.3
Private employee	29	9.7
Merchant	23	7.7
Housewife	208	69.3
Ethnicity		
Banjarnese	234	78.0
Javanese	54	18.0
Other	12	4.0
Family income		
Rp. 200,000 – Rp.6,800,000	285	95.0
Rp. 6,800,001 – Rp.13,400,001	11	3.7
Rp.13,400,002 – Rp.20,000,002	4	1.3
Median=2,759,933 QD=2,595,460 Min: 200,000 Max: 20,000,000		
Number of children		
1	144	48.0
2	113	37.7
> 2	43	14.3

A majority of respondents (62.7%) were considered to have poor levels of knowledge and only 7.7 percent had good knowledge levels. Regarding perception, 78.7% of the respondents had moderate perception scores, as shown in Table 2.

Table 2 Number and percentage of respondents by psycho-social factors

Psycho-social factors	Number (n = 300)	Percent (%)
Level of knowledge[a]		
Good	23	7.7
Moderate	89	29.7
Poor	188	62.7
Level of perception[b]		
High	25	8.3
Moderate	236	78.7
Low	39	13.0

[a]Score: Good=9-11, Moderate=7-8, Poor=0-6; [b]Score: High=38-39, Moderate=33-37, Low=0-32

Regarding the sources of information about ECC and its prevention, most of the respondents (98.7%) obtained information from the mass media and 92 % of them received information from individuals.

Concerning social support, the results show a great majority of respondents (78.7%) had poor levels of social support. Only 21.3 percent of the respondents had good levels of social support. Table 3 also shows that more than half of the respondents (54%) had poor preventive behavior and the rest had good behavior.

Table 3 Number and percentage of respondents by level of social support and preventive behavior

	Number (n = 300)	Percent (%)
Social supports[a]		
Good	64	21.3
Poor	236	78.7
Preventive behavior[b]		
Good	131	43.7
Poor	169	56.3

[a]Score: Good=2-4, Poor=1; [b]Score: Good > 3, Poor ≤ 3

In order to give a complete picture of the respondents' preventive behavior, each aspect of preventive behavior was analyzed separately. The results are shown in table 4. Based on their oral hygiene habits, 96 percent of respondents had good preventive behavior; based on their dietary habits, 40 percent had good behavior; meanwhile based on regular dental check ups, only 3.7 percent had good behavior.

Table 4 Respondents' preventive behavior inlation to the preventive behavior aspects

Preventive behavior	Good		Poor	
	n	%	n	%
Oral hygiene habits (brushing teeth everyday)	288	96.0	12	4.0
Dietary habits**	120	40.0	180	60.0
Regular dental check ups*	11	3.7	289	96.3

Association between independent variables and preventive behavior

None of the independent variables had a significant association with the overall score for preventive behavior, which was shown in Table 5 below.

Table 5 Associations between independent variables and preventive behavior

Independent Variables	Dental caries preventive behavior				$\chi 2$ (df)	p-value
	Good		Poor			
	n=131	%	n=169	%		
Age group (years):					0.334	0.846
<25	18	40.00	27	60.00	(2)	
25 – 35	88	44.67	109	55.33		
>35	25	43.10	33	56.90		
Education:					0.140	0.932
Primary school	18	46.15	21	53.85	(2)	
Secondary school	28	42.42	38	57.58		
High school and higher education	85	43.59	110	56.41		
Occupation:					1.110	0.292
Have jobs	36	39.13	56	60.87	(1)	
Housewives	95	45.67	113	54.33		
Ethnicity:					0.110	0.740
Banjarnese	101	43.16	133	56.84	(1)	
Non-Banjarnese	30	45.45	36	54.55		
Family income:					0.685	0.408
≤ Rp. 6,800,000	126	44.21	159	55.79	(1)	
> Rp. 6,800,000	5	33.33	10	66.67		
Number of children:					1.457	0.483
1	58	40.28	86	59.72	(2)	
2	54	47.79	59	52.21		
> 2	19	44.19	24	55.81		

Table 5 Associations between independent variables and preventive behavior (cont.)

Independent Variables	Dental caries preventive behavior				$\chi 2$ (df)	p-value
	Good		Poor			
	n=131	%	n=169	%		
Knowledge:					0.955	0.620
Good	8	34.78	15	65.22	(2)	
Moderate	38	42.70	51	57.30		
Poor	85	45.21	103	54.79		
Perceptions:					0.118	0.943
High	11	44.00	14	56.00	(2)	
Moderate	102	43.22	134	56.78		
Low	18	46.15	21	53.85		
Sources of information:						
Mass media					3.142	0.135[f]
Yes	131	44.26	165	55.74	(1)	
No	0	0	4	100		
Persons					2.230	0.135
Yes	124	44.93	152	55.07	(1)	
No	7	29.17	17	70.83		
Social Support:					0.072	0.788
Good	27	42.19	37	57.81	(1)	
Poor	104	44.07	132	55.93		

[f] p-value from the Fisher-exact test

Associations between independent variables and oral hygiene habits, dietary habits, and regular dental check ups

None of the independent variables had a significant association with the oral hygiene habits of mothers. As for regular dental check ups, a significant association between level of social support and regular dental check ups was found with a p-value of 0.001. However, data were insufficient to perform further analysis. These results are not shown.

A significant association was found between age and dietary habits (p-value = 0.04). Regarding the age of the respondents, 28.9 percent of those younger than 25 and 31 percent of those older than 35 had good behavior. The 25 to 35 age group contained the highest percentage (45.2%) of respondents with good levels of behavior.

With regard to educational background, the respondents who finished secondary school had the highest percentage (53%) of respondents with good behavior. There was a significant association between educational background and dietary habits (p-value = 0.006).

Regarding their occupational background, 43.8 percent of respondents who were housewives had good behavior, which was higher compared to 31.5 percent in the group of working mothers. There was a significant association between occupation and dietary habits (p-value = 0.046).

The rest of the socio-demographic characteristics, i.e. ethnicity, family income, and number of children, had no significant association with the dietary habits.

Table 6 Associations between independent variables and dietary habits

Independent variables	Dietary habits				χ^2 (df)	p-value
	Good		Poor			
	n=120	%	n=180	%		
Age group (year)					6.458	0.040*
<25	13	28.9	32	71.1	(2)	
25 – 35	89	45.2	108	54.8		
>35	18	31.0	40	69.0		
Education					10.349	0.006**
Primary school	20	51.3	19	48.7	(2)	
Secondary school	35	53.0	31	47.0		
High school and higher education	65	33.3	130	66.7		

Table 6 Associations between independent variables and dietary habits (cont.)

Independent Variables	Dietary habits				$\chi 2$ (df)	p-value
	Good		Poor			
	n=120	%	n=180	%		
Occupation					3.974	0.046*
Working	29	31.5	63	68.5	(1)	
Housewives	91	43.8	117	56.2		
Knowledge					0.613	0.736
Good	10	43.5	13	56.5	(2)	
Moderate	38	42.7	51	57.3		
Poor	72	38.3	116	61.7		
Perceptions					2.837	0.242
High	8	32.0	17	68.0	(2)	
Moderate	92	39.0	144	61.0		
Low	20	51.3	19	48.7		
Information from mass media					0.380 (1)	0.652[f]
Yes	119	40.2	177	59.8		
No	1	25.0	3	75.0		
Information from individuals					0.030 (1)	0.862
Yes	110	39.9	166	60.1		
No	10	41.7	14	58.3		
Social support					1.751	0.186
Good	21	32.8	43	67.2	(1)	
Poor	99	41.9	137	58.1		

[f] p-value from Fisher exact test; *Significant at p-value < 0.05; **p-value < 0.01.

Discussion

Dental caries preventive behavior

The results of this study show that there was a higher percentage of mothers with poor levels of preventive behavior, than with good behavior. More than one-third of the mothers (43.7%) had good levels of overall preventive behavior. Two studies in Thailand gave contradictory results. A study by Sithan (2003) reported lower percentages (24.2%) and one by Khue (2000) showed higher percentages (62.3%) of mothers with good preventive behavior.[10, 11]

Oral hygiene habits

It is quite surprising that almost all (96%) of the mothers had children whose teeth were brushed everyday, which was reflected in their oral hygiene habits. This number is higher than the daily tooth-brushing habit score in South Kalimantan province, which was 94.4 percent.[12] It is even higher the than national score. According to national basic health research (Riskesdas 2007), 91.1 percent of Indonesian people aged more than 10 years old were brushing their teeth on a daily basis.[13] However, the score is relatively similar to that of a study by Gultom M. (2010) in North Sumatera, which found 96.7 percent of mothers brushed their children's teeth daily.[14]

Dietary habits

The data collection process revealed that many preschools also provide extra services, in effect acting as day care centers, which allowed the mothers to leave their children all day long, even after school hours were over. So these schools were also responsible for providing snacks or even lunch for the children. Considering that nowadays, even more mothers have to join the workforce, not just for economical reasons, but also for self-achievement, the role of these preschools and day care centers is becoming more important, especially in relation to the dietary habits of the children.

As shown in previous research by Adeniyi A. et al. (2009), older mothers had better dental health preventive behavior than younger ones.[15] In this study, the 25 to 35 age group contained a higher percentage of respondents with good levels of behavior than the other two age groups. Women in this group seemed to have better levels of behavior (45.2%) than mothers younger than 25 (28.9%). This age group might represent the best age for taking care of children aged 3 to 5, who are usually very lively. The oldest age group, a lower percentage of mothers in their late thirties, also exhibited good preventive behavior (31%), higher than that in the youngest group. Moreover, a significant association was found between age and mothers' dietary habits, which differs from findings in previous studies conducted in Thailand.

In the chi-square analysis, it seems that the highest percentages of mothers with good behavior were those who had finished secondary school. However, this study found a significant association between educational level and dietary habits (p-value = 0.006). This finding confirms previous studies by Chandna et al. (2010) and Eckert et al. (2010),[16, 17] but contradicts another study by Mohebbi et al. (2007).[18]

Maternal employment was significantly associated with dietary habits (p-value = 0.046). This is consistent with a study by Sithan (2003).[10] Yet, it was differs from a study by Khue (2000), who found a significant association between mother's occupation and mother's preventive behavior.[11] It can be

seen that a higher percentage of mothers who were housewives had good preventive behavior compared to those who had jobs.

In this study, age, maternal education, and occupational background were factors which were each found to have a significant association with mothers' dietary habits for their children. The percentages of respondents with good behavior fell as maternal age and educational levels rose. On the other hand, the proportion of respondents who were housewives with good preventive behavior was higher compared to those who had jobs. It seems that regardless of their age and educational background, if they were housewives they were more likely to have good preventive behavior. This might be because they had more time to devote to their children and domestic responsibilities, and thus a better opportunity to take care of their young children. It is time-consuming to make preschoolers willing to brush their teeth. This assumption surely needs further investigation.

Regular dental check ups

With regard to regular dental check ups, less than 10 percent of the mothers had ever taken their children for dental check ups. These results are surprising in view of the fact that check ups are free. Banjar district has but a policy of providing free basic health services in health centers for the community, which includes dental service, for the last few years. Based on study by Nora (2007) on evaluation of this policy, the visit rate increased significantly in most of the health centers.[22] The findings in this study may indicate that having dental check ups was not part of the higher visit rate. The question of why they failed to attend regular check ups merits further research.

Sources of information about dental caries and preventive behavior

This study reveals that mothers got most of their information from mass media, which is similar to previous findings by Sithan (2003), who found that most mothers received information from television.10 However, there was no significant association between sources of information and preventive behavior. This finding is consistent with previous studies by Khue (2000) and Sithan (2003).[10- 11]

People have the ability to expand their knowledge by learning from society, such as learning from the symbolic environment of mass media, i.e. from television, and learning by observing other people's actions and the consequences of these actions for them.[23]

Social support and dental caries preventive behavior

A significant association was found between the level of social support and regular dental check ups, which is similar to previous findings by Hallett et al. (2003) and Finlayson et al. (2007).[24- 25] This finding underlines the importance of people surrounding the mothers, especially in taking the children to have regular dental check ups.

Recommendations

Nowadays, ever more wives have to join the workforce, not just for economical reasons but also for women's self-achievement. This makes these working mothers less able to devote time to their children and domestic responsibilities. To fill this gap in child-rearing, the role of the preschools and daycare centers is becoming ever more important. Therefore, the quality of these institutions should be raised so

that they can meet the objective of achieving better dental health for young children.

The role of the key people surrounding the mothers, such as family members, health center personnel, and school teachers, is becoming ever more important, not only as sources of health information, but also as part of the mothers' social support. Therefore, they need to be encouraged to meet the objective of achieving better dental health for young children. Meanwhile, the importance of sources of information on mothers' preventive behavior need to be reassessed, and strategies need to be developed to improve levels of media health literacy within the community, and for mothers in particular, so that health information can be appropriately filtered, absorbed and applied.

Furthermore, in-depth study might be necessary to construct the knowledge items to obtain a reliable tool to measure the mothers' level of knowledge. The finding about the low level of regular check ups also merits further research.

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