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Knowledge and Use of Oral Rehydration Therapy among Mothers of under-five children in a Military Barrack in Ibadan, Nigeria

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ABSTRACT

This study was designed to assess the knowledge of diarrhoea and ORT and identify diarrhoea management practices involving use of SSS among mothers of under-five children in a Military Cantonment, Akinyele Local Government Area, Oyo State, Nigeria. A two-stage random sampling technique was used to select 403 mothers of under-five children in the Military Cantonment. A validated semi-structured questionnaire was used for data collection. The questionnaire included 20-point diarrhoea knowledge and 16-point ORT/SSS knowledge scales. Diarrhoea knowledge scores of 0-8, >8-13 and >13-18 were rated as poor, fair and good while the ORT/SSS knowledge scores of 0-5, >5-10 and >10-16 were considered poor, fair and good, respectively. The age of respondents was 29.8 ± 5.5 years. Their main occupations are petty-trading (43.0%), full-time "housewives" (35.7%) and artisanship (12.9%). Most respondents (98.0%) were aware of ORT, 95.0% correctly stated the composition of SSS and 43.9% were able to state the correct proportions of sugar, salt, and water in SSS. Respondents' sources of information about ORT included health personnel (78.7%), relatives (11.4%) and television (6.0%). The listed causes of diarrhoea included teething (51.7%) and dirty environment (29.0%). Diarrhoea was perceived by 46.0% to be a serious health condition. Respondents with good, fair and poor knowledge of diarrhoea were 26.8%, 60.8% and 12.4% respectively. Majority (79.9%) of respondents reported that their child (ren) had diarrhoea within the three months preceding the study and the home treatment given included use of ORT (49.5%); others gave orthodox (22.6%) and native medicine (3.7%). Seventy per cent of respondents stated that they could prepare SSS, but 72.7% preferred taking children with diarrhoea to the hospital instead of using SSS. Forty-nine per cent of the respondents were of the view that cleanliness of the environment was one of the preventive measures against childhood diarrhoea. No significant association was found between mothers' knowledge of diarrhoea and the use of oral rehydration therapy ($p=0.243$). However, mothers' parity significantly influenced management of diarrhoea positively ($p=0.003$). Knowledge about diarrhoea diseases and oral rehydration therapy was high among respondents, but their use of oral rehydration was low. Training, public enlightenment and social marketing strategies are needed to promote the use of oral rehydration therapy among mothers of under-five children in military cantonment.

Key words: Diarrhoeal diseases knowledge, under-five caregivers, Oral rehydration therapy, Military Cantonment.

INTRODUCTION

Diarrhoeal diseases remain one of the leading causes of preventable death, especially among children aged

under-five years in developing countries (Yilgwan and Okolo, 2012; Keusch et al., 2006). Global mortality estimates from diarrhoea and its complications range from 1.5 to 5.1 million deaths per year for children

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under the age of five (Karambu et al., 2013; Yilgwan and Okolo, 2012). Eight out of ten of these deaths occur in the first two years of life (UNICEF/WHO, 2009; Mengistie et al., 2013). On the average, children below three years of age in developing countries experience three episodes of diarrhoea each year. In many countries, diarrhoea including cholera is also an important cause of morbidity among older children and adults (WHO, 2005). Frequent or prolonged diarrhoea can lead to poor nutritional status, and repeated episodes of diarrhoea can also leave children susceptible to other infections. Furthermore, malnutrition can increase the severity, duration, and frequency of bouts of diarrhoea (Mirza et al., 1997).

Diarrhoea leads to death through dehydration. Although in developing nations the number of deaths from diarrhoea remains high, there has been a substantial decrease, mainly attributed to the use of Oral Rehydration Therapy (ORT). Oral rehydration therapy is a simple and inexpensive; potentially effective treatment for dehydration related to diarrhoea which has been promoted widely throughout the developing world since the late 1970s (Pakenham-Walsh, 2007). According to Bellemare et al. (2004) and Guandalini (2005), despite the success of oral rehydration therapy (ORT), its proven efficacy and recommendations for use by various organizations, studies show that ORT continues to be underused globally, and specifically by physicians in high-income countries. A recent report showed that ORT is being delivered to only 20% of the world's children who could benefit and that widespread use could prevent 15% of deaths among children under five years (World Health Organisation [WHO], 2009). Postulated reasons for underuse include the fear of inducing iatrogenic hypernatremia, time requirements, questionable efficacy in moderate dehydration, and parental preference (Jadad and Enkin, 2007).

The World Health Organization's (WHO) definition of ORT includes oral rehydration salt (ORS) solution, recommended home fluids (RHF) also known as Salt Sugar Solution (SSS) and breastfeeding. Oral rehydration therapy includes rehydration and maintenance fluids with oral rehydration solutions (ORS) combined with continued age-appropriate nutrition. The Oral Rehydration Therapy (ORT) involves rehydrating children by replacing fluids and electrolytes lost through diarrhoea. According to current World Health Organisation/United Nations Children Education Fund (WHO/UNICEF) guidelines, ORT should begin at home with "home fluids" or a home-prepared "salt and sugar" solution at the first sign of diarrhoea to prevent dehydration. Feeding should be continued at all times (WHO, 2005). The home management of diarrhoea with oral rehydration solution

is beneficial in preventing dehydration and death of young children (Saurabh et al., 2014; Adimora et al., 2011). It has been a key intervention in improving health outcomes among under-five children in developing countries.

It has been reported that managing diarrhoea at home is quite common among mothers of under-five children especially in the rural areas, however, their level of knowledge on the use of ORT is poor (Ansari et al., 2012; Ogunrinde et al., 2012). Few studies carried out on home management of diarrhoea in Nigeria have shown an unsatisfactory level of knowledge and poor methods of home management of childhood diarrhoea (Okoh and Alex-Hart, 2014; Uchendu et al., 2011; Adimora et al., 2011). Therefore mothers of under-five children's poor knowledge in the management of diarrhoea is a contributory factor to its morbidity and mortality. Despite universal popularity of oral rehydration solution (ORS) in preventing dehydration due to diarrhoea, its use in practice is very low (Ogunrinde et al., 2012; Ahmed et al., 2009). Under-utilization is further complicated by incorrect preparation of ORS which is related to lack of mothers' prior experience (Azim et al., 2005; MacDonald et al., 2005). Unfortunately, millions of children die every year due to failure to replace fluid effectively (Mengistie et al., 2013). Often the caregivers are late in recognising diarrhoea as a major cause of dehydration which is a major cause deaths among children with diarrhoea (Saurabh et al., 2014; Adimora et al., 2011; Cézard et al., 2007). This study investigated mothers of under-five children's knowledge and home management of diarrhoea using oral rehydration as part of efforts to develop appropriate intervention to promote use of ORS during episodes of diarrhoea.

METHODOLOGY

The Setting: The study was a descriptive cross-sectional survey conducted in a military cantonment in Ibadan, a metropolis inhabited by approximately five million persons. The barrack, which was founded in 1972 and headed by a General Officer Commanding (GOC), is second largest in Nigeria with 23 units under its control. Garrison units, which is the residential area of the cantonment, is divided into three blocks namely; Soldiers' blocks (48 blocks, each block contains 30 rooms making a total of 1440 rooms), Senior Non-commission Officers' blocks (214 flats) and Officers' blocks (107 flats) beside the administrative section. The population of people who lived in the barracks was 3000 as at 2009 when the study was conducted. The study population consisted of mothers of under-five (U-

5) children who permanently reside in the military cantonment in Akinyele Local Government Area, Oyo State, Nigeria.

Sampling Procedures: A simple random sampling technique was used in selecting a total of 403 mothers of U-5. The number of respondents selected from each of the three strata in the barracks namely the Soldiers', Non-commissioned Officers and officers' quarters were 299, 71 and 33 respectively. Respondents were selected proportionately from the three strata, however, some rooms and flats were occupied by unmarried soldiers and officers while others do not have under-five children.

In each selected household, a 44-item semi-structured questionnaire was administered to a consenting mother of under-five. The questionnaire was divided into five sections for ease of administration namely socio-demographic characteristics, knowledge on diarrhoea, ORT and home management of diarrhoea in U-5 children. Prior to its administration, the questionnaire was field-tested to assess clarity of the questions and respondents ability to understand them.

Two trained female interviewers approached each potential respondent and explained the purpose of the study and invited them to participate in it. Official permission for the study was obtained from the GOC. Verbal informed consent was obtained from each respondent after she was told that participation in the study was voluntary, that data collected will be used for research purposes and that the data collected will be kept confidential.

Data analysis: The completed questionnaires were checked for completeness in the field; open-ended questions were coded and the data were analysed with Statistical Package for Social Sciences version 15. A 20-point knowledge scale on prevention of diarrhoea was developed and categorised into three: poor (0-8 points), fair (>8-13 points) and good (>13-20 points). A 16-point knowledge scale on Oral Rehydration Therapy/SSS was also developed; a score of 0-5, >5-10 and >10-16 were categorised as poor, fair and good respectively. Data were analysed using descriptive statistics, t-test and ANOVA at p=0.05.

RESULTS

Socio-demographic profile of respondents: The ages of respondents ranged from 17 to 47 years with a mean of 29.8 years (SD 5.5). The highest percentage (47.1%) belonged to the 20-29 years age group. Most (99.3%) of the respondents were

married and about two thirds were Christians (63.1%). Sixty-two per cent of the respondents had secondary school education while a few (6.0%) had no formal education. The highest proportion of respondents were Hausa (39.5%) (Table 1).

Table 1:
Socio-demographic profile of the respondents (N=403)

Demographic Information	No	%
Age		
10–19 years	5	1.2
20–29 years	190	47.1
30–39 years	184	45.7
40–49 years	24	6.0
Religion		
Christianity	254	63.1
Islam	142	35.2
Traditional	7	1.7
Marital Status		
Married	400	99.3
Divorced	2	0.5
Widow	1	0.2
Occupation		
Petty trading	172	42.7
Housewives	144	35.7
Artisan	52	12.9
Public Servants	13	3.2
Teaching	7	1.7
Farming	6	1.5
Others (auxiliary nurse, students)	9	2.2
Ethnicity		
Hausa	159	39.5
Igbo	123	30.5
Yoruba	117	29.0
Others	4	1.0
Educational Level		
No formal education	24	6.0
Primary education	89	22.1
Secondary education	251	62.2
Tertiary education	39	9.7

Awareness and knowledge about diarrhoea

All (100%) the respondents had heard about diarrhoea disease. Sixty-six per cent of the respondents heard about diarrhoea from healthcare workers. Eighty-three per cent of the respondents wrongly identified cough as incorrect symptoms of diarrhoea, 2.0% specified noise in the stomach, and 1.7% stated high temperature and loss of appetite while 1.5% indicated stooling. More than half of the respondents (51.6%) stated that teething was a cause of diarrhoea and 38.2% associated dirty environment as a cause. Less than half of the respondents (45.9%) reported that diarrhoea is a 'very serious disease', 40.9% stated that it is 'serious' while 9.4% believed it is 'not serious'; 3.2% did not answer the question. Testing for association between factors, respondents' educational level did not significantly influence level of knowledge of diarrhoea (p=0.408), however, mothers' perception of seriousness of the disease significantly positively influenced practice (p=0.000) of use of ORS/SS in the home management of diarrhoea (Tables 3 and 4).

Knowledge of prevention of diarrhoea

Overall, the mean knowledge score of respondent for the prevention of diarrhoea was 13 ± 2.4 out of a maximum of 20. Majority (77.2%) of the respondents disagreed with the notion that washing hand without

soap while preparing food for the child could prevent diarrhoea. Virtually all (97%) respondents were in the affirmative that one should ensure that water is clean before giving the child to drink. About two thirds (64.5%) agreed that early treatment of the child can help prevent diarrhoea complications (Table 5). Respondents with good, fair and poor knowledge of diarrhoea were 26.8%, 60.8% and 12.4% respectively.

Table 2:
Respondents' knowledge of causes of diarrhoea (N=403)

Causes	No	%
Teething	208	51.6
Dirty environment	154	38.2
Contaminated food	69	17.2
Contaminated water	48	11.9
Lack of personal hygiene	17	4.2
Sugary or sweet food	17	4.2
Flies	8	1.9
Undigested food	3	0.7
Dirty feeding bottle	2	0.4
No idea	47	11.6

*Multiple responses included

Table 3:
Respondents' educational level and knowledge of diarrhoea (N = 403)

Educational attainment	Knowledge of diarrhoea				X ²	df	p-value
	Poor No (%)	Fair No (%)	Good No (%)	Total No (%)			
No formal	12 (50.0)	6 (25.0)	6 (25.0)	24 (100)	6.138	6	0.408
Primary	11 (12.4)	53 (59.6)	25 (28.1)	89 (100)			
Secondary	25 (10.0)	165 (65.7)	61 (24.3)	251 (100)			
Tertiary	2 (5.1)	21 (53.9)	16 (41.0)	39 (100)			
Total	50 (12.4)	245 (60.8)	108 (26.8)	403 (100)			

Table 4:
Association between respondents' perceived seriousness of diarrhoea and use of ORS/SSS (N = 403)

Perceived level of seriousness	Used ORS/SSS No (%)	Used other methods No (%)	Total No (%)	X ²	df	p-value
Serious	70 (42.4)	95 (57.6)	165 (100)			
Very serious	114 (61.6)	71 (38.4)	185 (100)			
Not serious	12 (30.0)	28 (70.0)	40 (100)			
Don't know	3 (23.1)	10 (76.9)	13 (100)			
Total	199 (49.4)	204 (50.6)	403 (100)			

Knowledge of prevention of diarrhoea

Overall, the mean knowledge score of respondent for the prevention of diarrhoea was 13 ± 2.4 out of a maximum of 20. Majority (77.2%) of the respondents disagreed with the notion that washing hand without soap while preparing food for the child could prevent diarrhoea. Virtually all (97%) respondents were in the affirmative that one should ensure that water is clean before giving the child to drink. About two thirds (64.5%) agreed that early treatment of the child can help prevent diarrhoea complications (Table 5). Respondents with good, fair and poor knowledge of diarrhoea were 26.8%, 60.8% and 12.4% respectively

Knowledge of oral rehydration therapy

The mean knowledge score of respondents for oral rehydration therapy was 7.61 ± 1.76 out of 16. Almost all the respondents (98.3%) had heard about Oral Rehydration Therapy (ORT) and 93.4% agreed with the statement that ORT is used for the home management of diarrhoea, while 1.5% disagreed. Most of the respondents (80.1%) heard of ORS from health care personnel. In Table 6, majority of the respondents (87.3%) stated that ORT consists of Salt, Sugar and Water. Twenty-seven per cent of the respondents had good knowledge of ORT, 63.3% had fair knowledge while 9.9% had poor knowledge. Regarding the safe utensil to use to give oral rehydration solution to a child who has diarrhoea, 82.9% indicated cup and spoon, 7.7% feeding bottle while 8.9% had no idea. Many of the respondents (65.3%) knew when the unused

prepared solution of ORS should be thrown away; that is within twenty four hours. Eighty-six per cent agreed that ORS should be given with other food while 6.2% disagree and 7.2% did not know.

Home management of diarrhoea

Majority, 322 (79.9%), of the respondents reported that their U5 children had ever had diarrhoea and 21.1% said their children had never. Among mothers who reported that their children had diarrhoea, majority (61.8%) gave ORT/SSS as home treatment while 4.6% gave native medicine (Table 7). In addition to home management of diarrhoea, majority (79.6%) took their children to the military hospital within the barracks for treatment of diarrhoea, 16.1% private hospital, 1.7% traditional healer, 1.4% chemist while 1.1% said University College Hospital (UCH). No significant association was found between mothers' knowledge scores on diarrhoea and the use of oral rehydration therapy ($p=0.243$) (Table 8). However, mothers' parity significantly influenced management of diarrhoea positively ($p=0.003$) (Table 9).

Suggestions for preventing diarrhoea among under-five children

Respondents' suggested measures for preventing diarrhoea are shown in Table 10. Highlights of the suggestions were clean home environment (66.0%), cleaning of feeding of feeding utensils (24.9%) and adequate diet for the child (13.6%).

Table 5:

Frequency distribution of mothers' responses to statements on knowledge of prevention of diarrhoea (N = 403)

Statements on prevention of diarrhoea	True № (%)	False № (%)	Don't know № (%)
Washing of hands without soap while preparing food for the child **	86 (21.3)	311 (77.2)	6 (1.5)
Using plate which has been used by other person without washing can prevent diarrhoea**	66 (16.4)	334 (82.9)	3 (0.7)
Mother always change her cloth on daily basis to avoid diarrhoea *	373 (92.5)	25 (6.2)	5 (1.2)
Ensuring that the water is clean before giving the child *	390 (96.8)	13 (3.2)	0
Exclusive breast feeding of the child prevent diarrhoea *	285 (70.7)	87 (20.1)	37 (9.2)
Cooking child's food where uncovered refuse is close **	55 (13.4)	340 (84.4)	8 (2.0)
Early treatment of the child can help prevent diarrhoea complications *	260 (64.5)	89 (22.1)	54 (13.4)
Eating of sand while crawling**	39 (9.7)	254 (63.0)	110 (27.3)
Disposal of faeces including those of infants around the house **	48 (11.9)	348 (85.6)	10 (2.5)
Using unclean infant feeding bottles **	45 (11.2)	351 (87.1)	7 (1.7)

* Correct statement; ** Incorrect statement

Table 6:
Respondents' knowledge of Oral Rehydration Therapy
(N=396)

Variable	N _e	%
Oral rehydration is used for the home management of diarrhoea		
True*	370	93.4
False	6	1.5
Don't know	20	5.1
The content of ORT		
Salt, Sugar and Water*	346	87.3
Salt, Sugar and Palm wine	37	9.4
Salt, Sugar and Oil	7	1.7
Don't know	6	1.5
Amount of sugar to salt to prepare at home		
5 cubes of sugar to 1L teaspoon salt*	177	44.7
4 cubes of sugar to 2L teaspoon salt	42	10.6
8 cubes of sugar to 5L teaspoon salt	25	6.3
WHO prepared sachet		
6 cubes of sugar to 3L teaspoon salt	12	3.0
10 cubes of sugar to 4L teaspoon salt	11	2.7
9	9	2.3
5 cubes of sugar to 5L teaspoon salt	3	0.8
Don't know	116	29.3
Quantity of water		
One beer bottle*	251	63.4
One Fanta® bottle (35cl)	84	21.2
One 75cl Eva® water bottle	19	4.8
One litre water	15	3.7
One glass cup	3	0.7
One bowl of water	2	0.5
Don't know	24	6.1
Other things that can be used as ORT		
Pap water	26	6.5
Coconut water	19	4.8
Gaari water*	14	3.5
Native medicine	10	2.5
Raw fufu	4	1.0
Rice water	3	0.7
Juice	2	0.5
Saline and gripe water	1	0.2
Don't know	315	79.9

Key * = correct answers

DISCUSSION

All the respondents have heard about diarrhoea disease and health personnel were their major source of information. This is similar to the findings of the study by Abiola and colleagues who reported (2010) that two-thirds of their respondents knew correctly what diarrhoea is. Despite the fact that majority got information about diarrhoea from health workers, more than half of the respondents still believed that teething causes diarrhoea. This is similar to the findings from

the study of AwadKamil (2012) who reported that about two-thirds of the study population believed that teething causes diarrhoea. Ige and Olubukola (2013) and Uti et al., (2005) also reported that many of their respondents associated symptoms such as diarrhoea with eruption of teeth in their children. This belief could be attributable to lack of cleanliness in the home environment where such children play, unhygienic behaviours and lack of proper child care. Moreover, during teething children get some irritation in their gums and try to rub on the gum with their fingers/hands or any objects they could lay their hands on. These in many instances are dirty and thus predispose the child to diarrhoea. The persistence of this notion may also be related to the low level of educational attainment among the respondents, 28% of whom had either primary or no formal education.

More than half of the respondents used ORT/salt for home management of diarrhoea. This could be due to the fact that ORT or the salt solution is available locally and cheap to prepare. The finding from this study is similar with the findings of Adimora et al (2011) and Agbon et al. (2010) who reported that majority of their respondents use ORT for episode of diarrhoea. However, there is still concern that about half of the respondents did not give ORT/SSS during episodes of diarrhoea indicating the need for developing appropriate intervention to promote this simple intervention.

We acknowledge one limitation of our study. The data on use of ORS/SSS is self-reported and cannot be verified. Respondents are likely to provide normative response with respect to use of interventions such as use of ORS/SSS during episodes of diarrhoea. Therefore these data must be interpreted with caution. Nevertheless, the study has provided information that is useful for planning interventions for prevention of diarrhoea and use of this simple intervention.

Table 7:
Types of home treatment respondents gave their children when sick of diarrhoea (N = 322)

*Type of home treatment	N _e	%
ORS/Salt Sugar Solution	199	61.8
Orthodox medicine	91	28.3
Nothing	16	4.9
Native medicine	15	4.6
Gaari water	1	0.3

* Multiple responses

Table 8:

Association between respondents' knowledge of diarrhoea and use of oral rehydration therapy

Knowledge	Used ORT/SSS	Used other methods	Total	X ²	df	p-value
	N ₂ (%)	N ₂ (%)	N ₂ (%)			
Good	47 (54.7)	39 (45.3)	86 (100)	4.178	3	0.243
Fair	136 (49.8)	137 (50.2)	273 (100)			
Poor	16 (36.4)	28 (63.6)	44 (100)			
<i>Total</i>	199 (49.4)	204 (50.6)	403 (100)			

Table 9:

Association between respondents' parity and use of ORS/SSS

Parity	Home management of diarrhoea			X ²	df	p-value
	Used ORT/SSS	Used other methods	Total			
One child	30 (39.0)	47 (61.0)	77 (100)	26.18	10	0.003
2-4 children	152 (52.1)	140 (47.9)	292 (100)			
>5 children	17 (50.0)	17 (50.0)	34 (100)			
<i>Total</i>	199 (49.4)	204 (50.6)	403 (100)			

Table 10:

Suggestions for the preventing diarrhoea among children 0-5 years (N=403)

Suggestions	N ₂	%
Environment should always be cleaned	266	66.0
Cleaning of feeding utensils	100	24.9
Mother should give child adequate diet	55	13.6
Avoid contaminated food	51	12.6
Washing of hands before and after toileting	41	10.1
Breastfeeding of the child	28	6.9
Proper washing of the breast	18	4.4
Children should not eat sugary or sweet things	14	3.5
Hand washing after playing	10	2.4
Drinking and domestic water use in preparing under-five children's food must be cleaned	6	1.5

*Include multiple responses

Health education is concerned with helping people develop practices that ensure their best possible well-being (WHO, 2009). It is concerned with improving or reinforcing knowledge attitude and behaviour of people through effective communication of factual information

using appropriate educational materials and methods. Health Education can therefore be used to bridge the gap between health information and health practices within the context of diarrhoeal prevention and use of ORS/SSS. The goal of health education intervention in this regard is to empower mothers with knowledge and imbue them with attitudes and skills that will enable them prevent diarrhoea and or promptly give ORT/SSS during episodes of diarrhoea. This can be achieved using four strategies. First, there is need for formal training of mothers on causes, prevention and treatment of diarrhoea ORT/SSS. In addition to correcting misconceptions about cause of diarrhoea, training provides opportunity for mothers to acquire skills through return-demonstration for correct preparation of SSS and how to give this to children who have diarrhoea. This training can be done in a workshop setting where trainer/trainee interactions facilitate learning. Such training can be organized in the community through local government health office. Secondly, education can also be provided for mothers during ante-natal or post-natal visits. Diarrhoea prevention and treatment can be included as a component of mother and child welfare program. Thirdly, volunteers' mothers/caregivers may be recruited and trained as peer educators who will be charged with the responsibility of informing and teaching skills for preparation of ORT/SSS and their use during episodes of diarrhoea. Suitable women may be recruited using existing women groups within the barracks. Trained women can serve as advocates for use of ORS/SSS. Finally, educational materials like

posters and handbills with pictorial illustrations on the steps involved in preparing SSS need to be developed and distributed by trained peer educators to each household in the barracks as part of strategies to promote use of SSS in this community. This will serve as a reminder each time they read the contents of the materials (Miyaguchi et al., 2014; Chuks, 2014).

In conclusion, the use of oral rehydration therapy is a proven intervention to prevent dehydration among children during episodes of diarrhoea. Despite high level of awareness of this intervention, many women in this survey did not use ORT during episodes of diarrhoea among their children. Misconception of cause of diarrhoea was also identified in this population, indicating need for health education interventions to bridge the knowledge and practice gap. Four health promotion and education interventions have been recommended to address this problem in the community.

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