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Oral Health Literacy and Psychosocial Factors and its Relation with the Dental Behavior of Child Carers

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Abstract

The main objective of the study was to assess the relation of oral health literacy and psychosocial factors with dental behavior of child carers. This cross-sectional study conducted among the carers of the child studying class V of Mohammadpur Preparatory and model school of Dhaka, during January to December 2015. The sample size was 370, selected by Purposive sampling. Data collected through face to face interview by using semi structured questionnaire. Oral health literacy was measured by Oral Health Literacy adult questionnaire and Psychosocial factors with additional questions to determine dental-efficacy, oral health competency and activation measure. Data analyzed with SPSS 17.0 software. The study found that all the carers were female. (46.8%) of the carer were in an age group of 31-35 years, and (83.2%) of them were housewife. (64.4%) had adequate oral health literacy, 28.6% had marginal literacy and 7.0% of the carers had inadequate literacy. These findings indicate that most of the carers had adequate literacy about oral health. Those who had more literacy about oral health their tooth brushing frequency twice a day was more (P<.05). Young aged carers (P<.05) and those were housewives in occupation (P=.05) were brushed their child teeth twice a day more than other carers. Low carer oral health competency showed more brushing frequency twice a day (P<.05). High carer activation measure -knowledge showed more dental visit by carers (P<.05) and high CAM-skill showed more brushing frequency twice a day (P<.05). High carer activation measure -confidence showed more dental visit by carers (P=.05).

Keywords: *Oral health literacy, psychosocial factor, dental behavior, child carers.*

Introduction

Health literacy in dentistry is "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate oral health decisions" (Horowitz & Kleinman, 2008). Oral health knowledge includes an understanding of the combined effects of normal oral bacteria; fermentable carbohydrates in the diet; daily personal oral health care practices (including brushing and flossing); the effects of tobacco, alcohol, and other drugs on oral health; and the importance of regular consultation with dentists and dental hygienists to maintain health and to find and address pathology in its early stages, when it is most treatable (Friedlander, Marder, Pisegna, &Yagiela, 2003). Oral health is seen from a health perspective as a balance between destructive factors such as sugar-rich diet, tobacco use, and poor oral hygiene versus protective factors including good oral hygiene and the application of fluoride, whether in toothpaste, rinses or varnishes, or in community drinking water (Sgan-Cohen & Mann, 2007).

Dentists' perspective, in contrast, is that oral health arises from the daily choices and disciplines of nutrition and oral hygiene and other habits. It is not possible for the public health system in the United States or in any area of the world to keep up with treatment of the decay rate in populations that do not take basic care of their own teeth (Treadwell & Formicola, 2005). Yet even when access is improved, as in the Oregon Health Plan dental coverage for children, unless the parent has a health belief system that includes the importance of preventive health services, the pattern of access only in situations requiring urgent care continues

(Treadwell & Formicola, 2005). Urgent care appointments for treatment of acute oral pain do not tend to allow the dialogue that might foster improved oral health literacy and improved oral health behaviors (Rustvold SR, 2012). Oral health is a mirror for general health and well-being (NIDCR, 2000). Oral health means more than healthy teeth; in addition, the health of the periodontium—the bone and soft tissue supporting the teeth is integral to general health (NIDCR, 2000; Harris & Garcia-Godoy, 2004). Identifying patients' and carers' perceptions of their information needs has been viewed as important in empowering patients and enabling them to make informed decisions regarding treatment options, and in increasing patient satisfaction (Luker et al., 1995).

Likewise, health care professionals have a responsibility to use education materials that will meet the special learning needs of carers. Providers tend to be unaware of their patients limited literacy levels (Bass et al., 2002). Social Cognitive Theory (SCT) specifies a core set of determinants, the mechanism through which they work, and the optimal ways of translating this knowledge into effective health practices. The core determinants include knowledge of health risks and benefits of different health practices, perceived self-efficacy that one can exercise control over one's health habits, outcome expectations about the expected costs and benefits for different health habits, the health goals people set for themselves and the concrete plans and strategies for realizing them, and the perceived facilitators and social and structural impediments to the changes they seek (Bandura, 2004a). Whereas most of the models of health behavior are concerned only with predicting health habits, and not how to change health behavior, SCT offers both predictors and principles on how to inform, enable, guide, and motivate people to adapt habits that promote health and reduce those that impair it (Bandura, 1997).

Several studies have investigated the relationship between self-efficacy and oral hygiene behavior such as tooth brushing or flossing. Study found that self-efficacy is significantly related to both the retrospectively reported and prospective self-monitored frequency of brushing and flossing. Their findings also suggested that educational programmes intended to increase the frequency of such behaviours should focus on increasing self-efficacy, reducing structural and life-style barriers to adherence, and involving significant others in educational efforts (McCaul et al). (1985). Stewart et al. (1997) also developed questionnaires to measure the self-efficacy in tooth brushing and flossing. In their cross-sectional study, they demonstrated that self-efficacy scale scores were significantly associated with brushing frequency, flossing frequency, frequency of dental visits, and dental knowledge. reported self-efficacy regarding oral health has been found to be lower than self-efficacy regarding general health and medication use among older adults, especially among non-Western ethnic minorities Kiyak (1996). Clarkson et al. (2009) developed oral hygiene self- efficacy asking patients how confident they were on a 7-point scale: following advice from their dentist about brushing their teeth; brushing their teeth as often as they should; for as long as they should; the way that they should. They showed that patients who experienced the intervention (tell-show-do approach) had better behavioural (timing, duration, method), cognitive (confidence, planning), and clinical (decrease in plaque, gingival bleeding) outcomes.

Self-efficacy is also useful to detect and predict the behavioural functioning between individuals at different levels of efficacy over time, and even variation within the same individual in the tasks performed or attempted but failed. Such measurement of changes in self-efficacy over time is important to evaluate the impact of patient education programmes. Self-efficacy beliefs also help determine how much effort people will give on an activity, how long they will persevere when confronting obstacles, and how resilient they will be in under adverse situations (Bandura, 1988). Smith et al. (1995) developed the PHCS expecting that, as an intermediate level health-specific measure, it would be useful in a variety of studies designed to examine diverse health-related behaviours and outcomes across a range of conditions or situations, in a way that more specific or more general measures would not be. It would also be relevant for studies in which individuals have had little experience with the behaviour and have not had a chance to develop more specific expectancies yet.

Identification of factors that explain participation in oral health behaviours would be useful for healthcare professionals in all practice settings to design intervention programmes to enhance participation in oral health behaviours. The main idea of PAM is that by using reliable and valid measures, consumers can be grouped based on their capability or readiness to engage in productive health behaviours. Activation is developmental in nature, with the different knowledge, belief, and skill elements constituting activation having a hierarchical order in the progression from low to high activation (Hibbard et al., 2004). Behaviours that are more challenging are unlikely to be adopted among those who are less activated. Findings indicate that when activation changes, behaviours change in the same direction (Hibbard et al., 2007a).

For patients in each level, experiencing a series of successes, with the particular challenges they face at that level, will likely build a sense of self-efficacy and increase activation (Bandura, 2004a) and feel more competent to manage their health. Tailoring care based on activation level improves outcomes of disease management and has shown more improvement in clinical indicators (Hibbard et al., 2009). The knowledge and skills of carers have an impact not only on the provision of oral care for their care recipients but also their perception of need, and may influence the frequency of contact with dental services. Their knowledge and practice of oral health care has generally been demonstrated to be inadequate (Simons et al., 2000), thus requiring basic oral health care training. Study reported that the oral health care education was well received and resulted in improved oral health care knowledge, attitudes and skills, resulting in reductions in plaque, denture stomatitis and improved gingival health of the residents, nevertheless still short of the acceptable level of oral health (Frenkel et al., 2002).

However, constraints on progress in the realm of oral health literacy with this population include the assumptions and methods of traditional dental treatment access, whether in private dental offices or public health clinics; personal and public health finance; individuals' health beliefs; and severe dental anxiety (Martino, 2011). Oral hygiene instruction is only the tip of the iceberg of oral health literacy. For oral hygiene instruction to be successful in improving oral hygiene practices, the recipient of this instruction must already have an orientation toward health promotion behaviors. This orientation is undergirded by a health stance of internal locus of control; understanding of the oral environment and the rationale for cleaning teeth; and motivation to practice the tooth brushing, flossing, and other activities recommended (Harris & Garcia-Godoy, 2004).

Background

One of the ways to reduce oral health disparities and improve the quality of dental care is by improving the public's oral health literacy (Horowitz and Kleinman, 2012). Oral health literacy (OHL), like general health literacy is critical for empowering individuals' ability to find and process oral health information from different and complicated sources in everyday life to promote and maintain good oral health (Kanj & Mitic, 2009). Dental caries is the most common chronic disease of children ages 5-17 and is five times more common than asthma. Although oral health in the United States (US) has improved significantly since the 1960s, preventable and untreated oral diseases remain widespread, particularly among children of low-income and minority status.

The General Accounting Office has reported that poor children have five times more untreated caries than children from higher income families. Untreated dental caries in children can lead to problems with eating, speaking, attending school, learning, and general health (CDC, 2009). Many reasons explain why preventable oral diseases remain widespread in children and why caregivers may not adopt preventive practices that are effective in maintaining oral health. Finances and access are major reasons but other reasons are plausible. We hypothesized that caregiver literacy may be an important explanatory variable in oral health behavior and the development of dental caries among children. Caregiver literacy is related to other health outcomes among young children and may represent a mutable factor for overcoming dental health disparities. Literacy skills are associated with general health and intersect with other health determinants in a myriad of ways (NIDCR, 2005). According to the most recent National Assessment of Adult Literacy (NAAL) Survey, almost half (43%) of

US adults are unable to accurately and consistently use available print materials for everyday activities such as those related to health and safety, finance, or civic engagement (Kutner M et al, 2006).

Similarly, in a nationally representative study, found that 28% of parents had below basic health literacy and greater than 2/3 were unable to correctly enter demographic information on health insurance forms (Yin HS et al, 2009). This disturbing trend in poor literacy is not improving; in fact, the total number of adults with inadequate literacy skills to function in the US increases by approximately 2.25 million persons annually (Education portal, 2009).The most recent NAAL was the first to measure health literacy of US adults, finding that both literacy and health literacy are highly correlated (Kunter M et al, 2006). Literacy is defined as "the degree to which individuals have the capacity to obtain, process, understand and act on (health) information and services needed to make appropriate (health) decisions." (USDHHS, 2000). Because of difficulty reading, processing, and acting upon the types of health information encountered in everyday life, approximately 77 million Americans may struggle in our current health-care system (Kunter M et al, 2006). Growing evidence of the importance of literacy in health outcomes has led a variety of professional and governmental organizations to prioritize interventions that improve health and health care for people with inadequate literacy skills. Indeed, efforts to address health literacy have emerged as a major goal of the research agenda of health professionals, policy makers, and advocates, as well as for the goals for Healthy People 2010 (USDHHS, 2000). Individuals with low literacy skills often have poorer health knowledge and health status, unhealthy behaviors, less utilization of preventive services, higher rates of hospitalizations, higher rates of chronic diseases, increased health care costs, and ultimately poorer health outcomes than those with higher literacy levels.

Although most published literacy studies have assessed adult health outcomes, there is a growing body of evidence that has examined the implications of low caregivers' literacy for children's health. Because children are dependent on their caregiver for access to health care, low adult literacy has potential detrimental implications for the pediatric population. In the mid-1990s, a series of studies linked low literacy to patient health behaviors with several studies suggesting associations between maternal literacy skills and health behaviors important for infant health such as smoking, immunizations, initiation of breastfeeding, and adherence to medical treatment. Two recent investigations measured parental literacy and pediatric health outcomes. The first found that glycemic control was directly related to the literacy of the parent. The second demonstrated that parents with low literacy had less asthma-related knowledge and their children were more likely to have moderate or severe persistent asthma, greater use of rescue medications, increased incidence of emergency department visits and hospitalizations (Miller EK, 2010). Despite advances in caries prevention over the past several decades, analysis of data from the National Health and Nutrition Examination Surveys (NHANES) indicates that the prevalence of caries in children ages 2 to 4 yrs increased from 18% in 1988-94 to 24% in 1999-04 (Tomar and Reeves, 2009). Changes in biological or proximal early childhood caries (ECC) risk factors (Tinanoff et al., 2002; Harris et al., 2004) cannot fully explain this phenomenon. Rather, demographic changes in tandem with emerging and re-emerging distal risk factors or determinants, such as being of minority racial status and certain family characteristics, appear to be a major driving force behind these current trends (Amstutz & Rozier, 1995).

Another potential determinant that has yet to be investigated is health literacy. Health literacy is now recognized as an important component of health care (Nielsen Bohlmanet al., 2004). Based on a nationally representative sample, Yin and co-workers reported that nearly 30% of US parents have difficulty understanding and utilizing health information (Yin et al., 2009).Systematic reviews in medicine have confirmed that low literacy is associated with adverse health outcomes such as poor knowledge, morbidity measures, general health status, and the use of health resources (Andrus and Roth, 2002; DeWaltet al., 2004). Two recent comprehensive reviews were conclusive in linking low parental health literacy and deleterious health behaviors that affect child health (Sanders et al., 2009a) and child health outcomes (DeWalt & Hink, 2009). Most studies

have found a direct association between caregiver health literacy and knowledge (DeWaltet al., 2004).

In dentistry, caregivers' infant and early childhood oral health knowledge is of paramount importance, because oral health behaviors are the exclusive domain of the caregiver during the early years of life. In "Oral Health in America," the Surgeon General stressed that if parents are unfamiliar with the importance and care of their child's primary teeth, they are unlikely to take the appropriate action that may prevent ECC or may fail to seek professional services (USDHHS, 2000).

Methods

Study design and sample

This study was under taken with the objective to assess the relation of oral health literacy and psychosocial factors with dental behavior of child carers according to the following methodologies

This cross-sectional study was conducted from 01st January, 2015 to 31st December, 2015. The study was conducted in two selected schools of Dhaka City named Mohammadpur Preparatory School (Bengali medium) and Mohammadpur model school and college. For the current study the populations were the child carers of the selected schools. From the respondents the sample was taken by non-probability purposive sampling and sample size was 370. Data were collected through face to face interview. Oral health literacy measured by a newly developed instrument, the Oral Health Literacy Adults Questionnaire (OHL-AQ), which was tested in a pilot study and showed to be reliable and valid (Naghibi Sistani *et al*., 2013).

It contains 17 items in four sections: reading comprehension comprises six questions which assess reading and the ability to comprehend oral health knowledge; numeracy comprises 4 questions assessing ability to calculate numbers in a dental prescription and a mouth-rinse instruction; listening comprises 2 questions evaluating effectiveness of communication skills; and decision-making comprises 5 questions related to common oral health problems and items extracted from medical history form. The correct answers were scored 1 and those wrong or unanswered, 0, giving a total score for the questionnaire ranging from 0 to 17. For analysis, the OHL-AQ scores were classified into three levels: inadequate, 0-9; marginal, 10-11; and adequate, 12-17 based on piloting (Naghibi Sistani *et al*., 2013b).

Psycho-social factors among carers were assessed with additional questions to determine the carer dental-efficacy (CDE), carer oral health competency (COHC) and carer activation measure (CAM) in managing oral health for their care recipients. For this study, a number of slight modifications were made to the original instruments to ensure that items were relevant to a carer. The five CDE items about oral care behaviours were constructed based on Bandura's social cognitive theory (Bandura, 1977).

It included

a) brushing teeth
b) maintaining regular dental check-up
c) giving a high priority for any dental problem
d) controlling snacking between meals
e) following instructions from dental professionals.

Similar to the perceived health competence scale developed by Smith et al. (1995), five COHC items were constructed about competency in managing oral health. It included

a) responsibility in caring for oral health
b) ability to do things for oral health as well as most other people
c) succeeding in the projects undertaken to improve oral health
d) achieving goals with respect to oral health
e) active role in maintaining their oral health.

Further, thirteen CAM items were modified from the patient activation measure (PAM) developed by Hibbard et al. (2004) to determine capability or readiness of carers to engage in productive oral health behaviours for care recipients.

Based on the statements, three subscales were formed

Knowledge, with four items on

1) prescribed medications
2) oral health problems and what causes them
3) what treatments are available
4) how to prevent further oral health problems.

Skills, with three items on

5) following instructions from dental professionals (also included in CDE)
6) responsibility in caring for oral health (also included in COHC)
7) active role in maintaining the oral health of care recipients (also included in COHC).

Confidence, with six items on

8) preventing or reducing oral health problems
9) need to go to the dentist
10) telling a dentist about possible dental concerns
11) maintaining a healthy diet
12) maintain a healthy diet, even during times of stress
13) figure out solutions when new problems arise with oral health condition.

Data were collected through pre-tested semi structured questionnaire. Oral health literacy was measured by Oral health literacy adult questionnaire (OHL-AQ) developed by Naghibi Sistani et al., (2013). Psychosocial factor among carers was assessed by additional questions to determine carers dental-efficacy, carer oral health competency, and carers activation measure

Analysis

Collected data were analyzed after thorough checking, cleaning, editing and compiling by using the SPSS (Statistical package for social science, version 19 for windows) software and scientific calculator. Continuous variables were recorded into categorical variable by creating groups. The data were presented in different Tables, charts. The data were presented in different tables in order to the variables. Frequency tables according to the variables. Cross tables to see the reproductive health practice according to the socio-demographic variables. Chi-square test was done to see the relation of oral health literacy and psychosocial factors and some selected variables. The test statistics was used to analyze the data is descriptive statistics and inferential statistic according to the demand of the study with 95% confidence interval. Level of significance was set at 0.05. Qualitative data were analyzed on the basis of themes.

Results

This was a cross sectional study, conducted in two selected schools with the main objective of assess the relation of oral health literacy and psychosocial factors with dental behavior of child carers. A total of 370 respondents were interviewed.

Socio-demographic status of female workers

Table 1 shows the descriptive statistics of the age of the carers respondents. Their age ranged from 23 to 40 years. Mean age of the carer were 32 years and Sd=3.262. Among 370 children, minimum age was 4years and maximum age was 9 years. Mean=6.25 and Sd =1.374. Among 370 respondents 78.11% (n=289) were belong to Islam religion and 21.89% (n=81) were belong to Hindu religion. Table shows that 70.5% (n= 261) of the mother and 31.4% (n=116) was graduated or less. And 68.6% (n=254) of the father were post graduated and this number in case of mother was 29.5% (n=109), which illustrate that mother of the children were post graduated and none of them are below higher secondary education. It shows that number of businessmen is higher in profession which is 46.8% (n=173) and then the numbers whom are involved in other profession 44.6% (n=165) like doing jobs in some organization or banking sector. Among them teacher and doctor were respectively 7.0% (n=26) and 1.6% (n=6). Table shows that average monthly income of the carers ranged from 30000- 100000tk. (mean=58202tk). Among all of them 7.0%(n=26) carers income ranged from below 50000tk. All most 83.2% (n=308) carers income ranged from 50000-70000 tk. And rest of the carers income ranged from 80000- 100000tk.

Distribution of the characteristics of the child carers

Table 2 illustrates the overall characteristics of the child carers. The age of the carers ranged from 23 to 40 years (mean 32 years). A higher number of carers were in the 31-35 years age group. There was no significant difference in the sex distribution as the respondents mentioned that mother is the main carers of the children. 78.11% (n=289) of the carers belongs to Islam religion and 21.89% (n=81) of them belongs to Hindu religion. A higher proportion of the carers

had the highest qualification as graduate or less (70.5%) and (29.5%) of them as postgraduate or more. Among 370 sample, most of the respondent comprised of housewife group of people which is 83.2% (n=308). This higher proportion of the housewife reflect that this group of women were more available during data collection period and others were less because of the involvement in job sector. Average income of the carers ranged from 30,000 -100000 tk per month.

Distribution of carer by oral health literacy

Table 3 shows the distribution of oral health literacy of the child carers. Some 64.4% (n=238) had adequate oral health literacy, 28.6% (n=106) had marginal literacy about oral health and 7.0% (n=26) of the carers had Inadequate literacy.

Table 1. Socio-demographic characteristics of the respondents/ carer n=370

Characteristics	Frequency	Percent %
Age of respondents (Years)		
≤30 years	139	37.6
31-35 years	173	46.8
≥36 years	58	15.7
Mean=32.04 SD=3.262		
Age of children (Years)		
Upto 5 years	132	35.7
6-9 years	238	64.3
Religion of respondents		
Islam	289	78.11
Hindu	81	21.89
Respondent's father education level		
Up to graduate	116	31.4
Post graduate and above	254	68.6
Respondent's mother education level		
Up to graduate	251	70.5
Post graduate and above	109	29.5
Occupation of the father		
Businessman	173	47
Service	197	53
Monthly family income of the child carers		
< Tk 50000	26	7.0
Tk 50000 -	308	83.2
80000-100000	36	9.7
Mean=58202.70, SD=13183.076		

Distribution of sex of the children by their educational level

Figure 1 shows that the total number of the children were 370 of whom 98 were from playgroup/kg, 44 were from class 1, 70 were from class 2, 90 were from class 3, 56 were from class 4 and 12 of them were from class 5. The boys' and girls' proportion were almost the same.

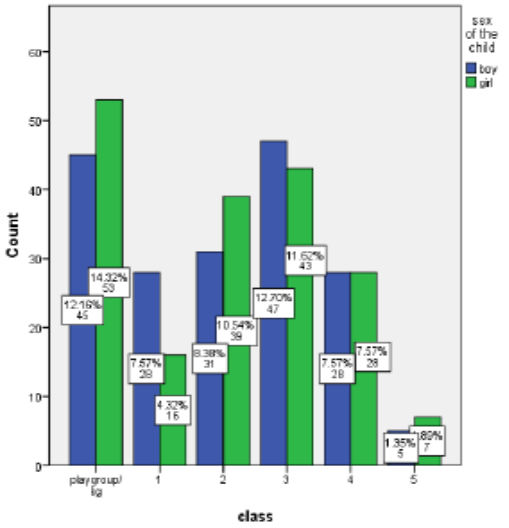

Figure 1. Distribution of sex of the children by their educational level

Table 2. Distribution of the characteristics of the child carers

Carers characteristics	Frequency	Percentage
Age		
≤ 30	139	37.5
31-35	173	46.8
36-40	58	15.7
Religion		
Islam	289	78.11
Hindu	81	21.89
Educational qualification		
Less than graduate	59	15.9
Graduate	202	54.6
Post graduate and above	109	29.5
Occupation		
Housewife	308	83.2
Service	62	17.0

Table- 3. Distribution of Carer by oral health literacy n= 370

Carer oral Health Literacy	Frequency	Percent
Inadequate	26	7.0
Marginal	106	28.6
Adequate	238	64.4
Total	370	100.0

Distribution of carers opinion about importance of oral health care for the children

This table 4 illustrates the importance of oral health care for the children. No carers mentioned oral health care to be less important for their children. 46.2% (n=171) of carers gave priority of oral health care for their children as very important. 35.4% (n=131) have reported it as extremely important and rest of 370 have mentioned it as important.

Table 4. Distribution of carers opinion about importance of oral health care for the children

Carers opinion about oral health care	Frequency	Percentage
Important	68	18.4
Very important	171	46.2
Extremely important	131	35.4

Distribution of the child's self-cleanliness of tooth

Table 5 shows the distribution of whether the child cleans his or her teeth by themselves or with/without some assistance. Number of children who clean their teeth without any assistance is higher than who clean teeth with some assistance.

Carers have reported 71.1% (n=263) of the child clean his/her teeth without any assistance. And 28.9% (n=107) clean their teeth with some assistance.

Table 5. Distribution of the child's self-cleanliness of tooth

Child's self-cleanliness of tooth	Frequency	Percent
With some assistance	107	28.9
Without any assistance	263	71.1

Distribution of tooth brushing frequency of the child

Some 64.9% (n=240) carers reported that their child tooth is cleaned twice a day and 35.1% (n=130) of them said that their children's teeth are brushed once a day.

Table 6. Distribution of tooth brushing frequency of the child

Tooth brushing frequency	Frequency	Percentage
Twice a day	240	64.9
Once a day	130	35.1
Total	**370**	**100.0**

Distribution of regular dental visit pattern of the children

Table 7 illustrates the regular dental visit pattern of the children. About 41.1% of the carer took their child to their dental visits. And 58.9% (n=218) reported that they do not maintain regular dental visit pattern for their child.

Table 7. Distribution of regular dental visit pattern of the children

Regular dental visit pattern	Frequency	Percentage
No	218	58.9
Yes	152	41.1
Total	**370**	**100.0**

Distribution of last dental visit of the children

Table 8 shows the distribution of last dental visit of the children. As children depend on their carers for their dental visits, this distribution describes the dental visit pattern of the child as practiced and 47.3% (n=175) of the carer reported that they took their child to a dental visit only with a dental problem. 8.1% (n=30) within two years, 1.1% (n=4) within one year, 5.9% (n=22) within six months and 37.3% (n=138) of the carer reported that they never took their child for a dental visit.

Table 8. Distribution of last dental visit of the children

Last dental visit - Child carer	Frequency	%
Never had a	138	37.3

dental visit		
Only with a dental problem	175	47.3
Within two years	30	8.1
Within one year	4	1.1
Within six months	22	5.9
Don't know	1	.3
Total	**370**	**100.0**

Distribution carer oral health competency

Table 9 shows the distribution of carer oral health competency. 80% (n=296) of the carer agreed for their child that they take responsibility in caring for their oral health. Over 50% (n=200) of the carer agreed that they are able to do things for their oral health as well as most other people. 62.7% (n=232) of the carer agreed that they take an active role in maintaining their oral health.

Association between carer characteristics and oral health literacy

Table 10 shows that there is no association between Carer's age, religion, highest qualification, occupation and average monthly income with Oral health literacy.

Association between oral health literacy and dental behavior

Table 11 shows that there is statistically significant association between Oral Health Literacy and Tooth brushing frequency of the children. (P-value<.005) and there is no significant association between dental visit pattern of the carer's for their children with oral health literacy. It shows that the carer's with marginal literacy are more in number who took their child for dental visit whenever there is any problem.

Association between carer characteristics and dental behavior (tooth brushing frequency)

Table 12 shows that Tooth brushing frequency has a significant association with the age of the carer, p=.001. And carer occupation has a statistically significant association with tooth brushing frequency. P=.048. but carer educational qualification, occupation and average monthly income has no significant association with tooth brushing frequency.

Association between carer characteristics and carer oral health competency

Table 13 shows that age of the carer is significantly related with carer oral health competency (p=.037). But there is no statistically significant relation between carer religion, occupation, highest qualification, occupation and average monthly income with carer oral health competency.

Association between carer characteristics and carer activation measure-knowledge

Table 14 shows that there is statistically significant association between Carer age. religion, qualification, occupation, and average monthly income with Carer activation measure subscale Knowledge.

Association between carer characteristics and carer activation measure-Skill

Table 15 shows that carer's qualification and average monthly income is statistically significantly related with carer activation measure subscale-skill. P-value for qualification and average monthly income is respectively .027 and .003. But there is no significant association between carer age, religion, and occupation with carer activation measure subscale – skill.

Association between carer characteristics and carer activation measure-confidence

Table 16 shows that carer age is significantly associated with carer activation measure-confidence. P-value is .047. But there is no significant association between carer religion, highest qualification, occupation, and average monthly income with carer activation measure-confidence.

Association between carer oral health competency and dental behavior

Table 17 shows that, Tooth brushing frequency has statistically significant association with Carer oral health competency. P-value is .007 and dental visit pattern of the carers for their child has no association with carer oral health competency.

Association between CAM-skill and dental behavior

Table 18 shows that tooth brushing frequency has statistically significant association with CAM-Skill. P= .010 and dental visit pattern of

the carers for their child has no association with CAM-Skill.

Table 9. Distribution carer oral health competency

Carer oral health competency	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	fr	%	fr	%	fr	%	fr	%	fr	%
1.I take responsibility in caring for their oral health	0	0.0	0	0.0	17	4.6	296	80.0	57	15.4
2. I am able to do things for their oral health as well as most other people	3	.8	17	4.6	128	34.6	200	54.1	22	5.9
3. I succeed in the projects I undertake to improve their oral health	15	4.1	60	16.2	183	49.5	106	28.6	6	1.6
4. I am generally able to achieve my goals with respect to their oral health	15	4.1	67	18.1	196	53.0	90	24.3	2	.5
5. I take an active role in maintaining their oral health	0	0.0	3	0.8	30	8.1	232	62.7	105	28.4

Table 10. Association between carer characteristics and oral health literacy

Carer characteristics		Oral health literacy		
		Inadequate	Marginal	Adequate
		fr (%)	fr (%)	fr (%)
Carer Age	30 years and less	15(11%)	38(27.3%)	86(62%)
	31-35 years	5(3%)	50(28.9%)	118(68.2%)
	36 years and above	6(10.3%)	18(31%)	34(59%)
Religion	Islam	19(7%)	83(29%)	187(65%)
	Hindu	7(9%)	23(28.4%)	51(63%)
Highest qualification	Less than graduate	4(7%)	14(24%)	41(69.5%)
	Graduate	17(8.4%)	56(28%)	129(64%)
	Post graduate & above	5(5%)	36(33%)	68(62.4%)
Occupation	Housewife	24(8%)	87(28.2%)	197(64%)
	Service	2(3.2%)	19(31%)	41(66.1%)
Average monthly income	< Tk 50,000	2(8%)	5(19.2%)	19(73.1%)
	Tk50,000-70,000	21(7%)	92(30%)	195(63.3%)
	Tk80,000-100000	3(8.3%)	9(25%)	24(67%)

Table 11. Association between oral health literacy and dental behavior

Dental behavior	Oral health literacy			Chi-square value	p-value
	Inadequate	Marginal	Adequate		
	fr (%)	fr (%)	fr (%)		
Tooth Brushing Frequency				20.068	.000
Twice a Day	10(38.5%)	57(54%)	173(73%)		
Once a Day	16(61.5%)	49(46.2%)	65(27.3%)		
Dental Visit Pattern				3.311	.191
Never had a Dental Visit	14(54%)	39(37%)	85(36%)		
Whenever problem occurs	12(46.2%)	67(63.2%)	153(64.3%)		

Table 12. Association between carer characteristics and dental behavior (tooth brushing frequency)

Carer characteristics		Tooth brushing frequency		Chi-square value	p-value
		Twice a day	Once a day		
		Fr%	Fr%		
Carer age	30 years and less	107 (77%)	32(23%)	15.021	.001
	31-35 years	97(56.1%)	76(44%)		
	36 years and above	36(62.1%)	22(38%)		
Religion	Islam	187(65%)	102(35.3%)	.015	.904
	Hindu	53(65.4%)	28(35%)		
Educational qualification	Less than graduate	39(66.1%)	20(34%)	.418	.811
	Graduate	133(66%)	69(34.2%)		
	Post graduate & above	68(62.4%)	41(38%)		
Occupation	Housewife	193(63%)	115(37.3%)	3.912	.048
	Service	47(76%)	15(24.2%)		
Average monthly income	< Tk 50,000	20(77%)	6(23.1%)	5.156	.076
	Tk50,000-70,000	192(62.3%)	116(38%)		
	Tk80,000-100000	28(78%)	8(22.2%)		

Table 13. Association between carer characteristics and carer oral health competency

Carer characteristics		Carer oral health competency		Chi-square value	p-value
		Low	High		
		Fr%	Fr%		
Carer Age	30 years and less	86(62%)	53(38.1%)	6.579	.037
	31-35 years	102(59%)	71(41%)		
	36 years and above	45(78%)	13(22.4%)		
Religion	Islam	178(62%)	111(38.4%)	1.080	.299
	Hindu	55(68%)	26(32.1%)		
Educational qualification	Less than graduate	32(54.2%)	27(46%	2.424	.298
	Graduate	132(65.3%)	70(35%)		
	Post graduate & above	69(63.3%)	40(37%)		
Occupation	Housewife	191(62%)	117(38%)	.726	.394
	Service	42(68%)	20(32.3%)		
Average monthly income	< Tk50,000	13(50%)	13(50%)	2.538	.281
	Tk50,000-70,000	195(63.3%)	113(37%)		
	Tk 80,000-100000	25(69.4%)	11(31%)		

Table 14. Association between carer characteristics and carer activation measure-knowledge

Carer characteristics		CAM-Knowledge	
		Low	High
		Fr%	Fr%
Carer Age	30 years and less	80(58%)	59(42.4%)
	31-35 years	82(47.4%)	91(53%)
	36 years and above	28(48.35%)	30(52%)
Religion	Islam	146(50.5%)	143(49.5%)
	Hindu	44(54.3%)	37(46%)
Educational qualification	Less than graduate	25(42.4%)	34(58%)
	Graduate	105(52%)	97(48%)
	Post graduate & above	60(55%)	49(45%)
Occupation	Housewife	156(50.6%)	152(49.5%)
	Service	34(55%)	28(45.2%)

Average monthly income	<Tk 50,000	10(38.5%)	16(61.5%)
	Tk50,000-70,000	159(52%)	149(48.4%)
	Tk80,000-100000	21(58.3%)	15(42%)

Table 15. Association between carer characteristics and carer activation measure-skill.

Carer characteristics		**CAM-Skill**		**Chi-square value**	**p-value**
		Low	**High**		
		Fr%	**Fr%**		
Carer Age	30 years and less	88(63.3%)	51(37%)	2.302	.316
	31-35 years	95(55%)	78(45.1%)		
	36 years and above	35(60.3%)	23(40%)		
Religion	Islam	173(60%)	116(40.1%)	.485	.486
	Hindu	45(56%)	36(44.45%)		
Educational qualification	Less than graduate	26(44.1%)	33(56%)	7.198	.027
	Graduate	121(60%)	81(40.1%)		
	Post graduate & above	71(65.1%)	38(35%)		
Occupation	Housewife	176(57.1%)	132(43%)	2.395	.122
	Service	42(68%)	20(32.3%)		
Average monthly income	<Tk 50,000	9 (35%)	17(65.4%)	11.638	.003
	Tk50,000-70,000	181(59%)	127(41.2%)		
	Tk80,000-100000	28(78%)	8(22.2%)		

Table 16. Association between carer characteristics and carer activation measure-confidence

Variable		**CAM-Confidence**		**Chi-square value**	**p-value**
		Low	**High**		
		Fr%	**Fr%**		
Carer Age	30 years and less	87(63%)	52(37.4%)	5.735	.047
	31-35 years	130(75.1%)	43(25%)		
	36 years and above	40(69%)	18(31%)		
Religion	Islam	198(68.5%)	91(31.5%)	.559	.455
	Hindu	59(73%)	22(27.2%)		
Highest qualification	Less than graduate	38(64.4%)	21(36%)	1.350	.509
	Graduate	145(72%)	57(28.2%)		
	Post graduate & above	74(68%)	35(32.1%)		
Occupation	Housewife	213(69.2%)	95(31%)	.080	.777
	Service	44(71%)	18(29%)		
Average monthly income	<Tk 50,000	15(4.05%)	11(2.97%)	2.082	.353
	Tk50,000-70,000	218(58.9%)	90(24.3%)		
	Tk80,000-100000	24(6.49%)	12(3.24%)		

Table 17. Association between carer oral health competency and dental behavior.

Dental behavior	**Carer oral health competency**		**Chi-square value**	**p-value**
	Low	**High**		
	Fr (%)	**Fr (%)**		
Tooth Brushing Frequency			**7.160**	**.007**
Twice a day	163(70%)	77(56.2%)		
Once a day	70(30%)	60(44%)		
Dental Visit Pattern			**.755**	**.385**
Never had a dental visit	83(36%)	55(40.1%)		
Whenever problem occurs	150(64.4)	82(60%)		

Table 18. Association between CAM-skill and dental behavior

Dental behavior	CAM-Skill		Chi-square value	p-value
	Low	High		
	Fr (%)	Fr (%)		
Tooth Brushing Frequency			**6.587**	**.010**
Twice a day	153(70.2%)	87(57.2%)		
Once a day	65(30%)	65(43%)		
Dental Visit Pattern			**.254**	**.614**
Never had a dental visit	79(36.2%)	59(39%)		
Whenever problem occurs	139(64%)	93(61.2%)		

Discussion

The main purpose of the study was to assess the relation of oral health literacy and psychosocial factors with dental behavior of child carers. The study populations were the child studying in playgroup to class V (Bengali medium) of Mohammadpur Preparatory School and College and Mohammadpur model School and college of Dhaka city during data collection period. The study was conducted within the time period of January to December 2015. The sample size was 370. Purposive sampling was used to collect data. Data collection tool was face to face interview with questionnaires containing structured and semi-structured questions according to the objectives and variables of the study. All data were entered into SPSS 17.0 software and will be analyzed. In this chapter the findings of the study are discussed under the following headings

1) Findings regarding socio demographic information of the respondents
2) Findings related dental behavior
3) Findings related to the Psychosocial factor related variables
4) Findings related to the Oral health literacy

Findings regarding socio demographic information of the respondents

In this study it was revealed that, maximum (46.8%) of the respondents were in between the age group of 31-35 years which was followed by 37.6% carers were less and equal 30 years of age. Young aged carers (P<.05) and those were housewives in occupation (P=.05) were brushed their child teeth twice a day more than other carers. Young aged carers had high Carer Oral Health Competency (COHC) than old aged carers but Religion, educational qualification and average monthly income were not related with COHC (P>.05). The mean age± SD was 32.04±3.262 ranged from 23-40 years these findings were not similar with study conducted Naghibi Sistani et al at 2013 in Iran to assess oral health literacy where the mean age was 36.2 (sd 12.9) and ranged from 18 to 65 years as because the study was carried out among adults of 22 districts of Tehran were considered as strata each weighted according to its population. Any unable to read or write Persian (the local language) was excluded (Sistani N et al, 2013) but in case of current study the study sample were the carers of child studying in playgroup to class V (Bengali medium) of the selected schools. In regards their child's age majority (64.3%) of the child were in between the age group of 6-9 years with the mean age± SD was 6.25±1.374 which was much higher than the findings of Miller K study conducted in North Carolina to assess the impact of caregiver literacy on children's oral health outcome where the age range of the children recruited was as follows: 8% were one, 25% were two, 18% were three, 18% were four, 19% were five, and 12% were six where children ages six and younger who presented for an initial dental appointment in the teaching clinics at the University of North Carolina at Chapel Hill School of Dentistry (Miller KE, 2010) but in case of current study the study children were selected by their educational status. Among 370 respondents maximum (26.5%) were from class playgroup/kg followed by 24.3% were from class 3 and majority (50.3%) were boy which was almost same with the girls (49.7%) which was much lower than the Miller K study where 59% of the children were male (Miller KE, 2010).

In this study we also found that, Majority (68.6%) of the child's father were completed postgraduate and above education as most (70.5%) of child's mother had completed graduation. Less educated carers were more skilled (P<.05) and confident (P=.05) in carer activation measure. In case of occupational status, maximum (53.0%) child's father were in service and on the other hand most (83.2%) of the child's mother were occupied as housewife. Most (83.2%) of the child's average monthly family income were in between the range of 50,000-70,000 BDT with the mean ± SD was 58,202±13183.076. Those who had less monthly income they had high carer activation measure than others (P=.05) and more skilled (P<.05).

Findings related dental behavior

In this study it also found that, among 370 respondents maximum (46.2%) carers were mentioned that oral health care is very important for their child followed by 35.4% were mentioned that as extremely important and rests (18.4%) were as important for their child. High carer dental efficacy showed more dental visit (P<.05) and not related with the brushing frequency (P>.05). These findings were not similar with the findings of Pradhan A study conducted in Adelaide where all carers reported oral health to be very important for their care recipientsn as care recepients depend on their careers for their daily oral hygiene and dental visits, information on the tooth brushing and dental visit pattern of care recipients was obtained from their carers as they were disable. (Pradhan A, 2012). Majority (71.1%) of the carers child cleaned their tooth without any assistance and rests (28.9%) were cleaned with some assistance which was differ from Pradhan A where 91.0% of care recipients needed assistance from their carers because in Pradhan A study the study samples were adulds with disabilities (Pradhan A, 2012) but in current study the care recipients were school going children, so many of them can cleaned their toth without any assistance.

Among 370 respondent's majority (64.9%) child were brushed their tooth twice a day and maximum (58.9%) were not maintained regular dental visit pattern for their child. Low carer oral health competency showed more brushing frequency twice a day (P<.05) but not related with the dental visit pattern (P>.05). In regards the last dental visit of the carers out of 370 carers maximum (58.1%) were visited last only with a dental problem and maximum (47.3%) carers were taken their child in last dental visit only with a dental problem. High carer activation measure showed more dental visit (P<.05) and not related with the brushing frequency (P>.05). All these findings were not similar with the findings of Pradhan A where a majority (91%) of them took their care recipients to their dental visits, some 77% of carers had personally visited the dentist within the last two years and 18% of them had visited only with a problem and 5% had never visited the dentist (Pradhan A, 2012) as the carers provided care to a different category of care recipients.

Findings related to the psychosocial factor related variables

From the current study we also found that out of 370 respondents, in case of carers dental efficacy most (72.7%) of the carers agreed that they give a high priority for any dental problem of their children and they (73.0%) carefully follow any instructions, their dental professional gives them about home care. Majority (68.9%) of them were disagreed for their child that they don't brush their teeth at least once a day and (52.4%) also they don't take their child for regular dental check-up. Only few (18.1%) of them were agreed that they control snacking between meals of their child these findings were. which were quite different from the findings of Pradhan A where over 65% of the carers strongly agreed that for their care recipients, they brush their teeth at least once a day, take them for regular dental check-up, give a high priority for any dental problem and carefully follow any instructions from their dental professional about home-care and only 37% of them strongly agreed that they controlled snacking between meals (Pradhan A, 2012) whether carers gave a high priority for any dental problem or followed professional instructions at home were also considered dental behavior specific judgment and accordingly included in the assessment but in case of current study as many care recipients were independent they can ate what they liked, whenever they wanted.

In case of carers oral health competency, most (80%) of the carers were agreed for their

child that they take responsibility in caring for their oral health and maximum (54.1%) of the carer agreed that they are able to do things for their oral health as well as most other people. Majority (62.7%) of the carer agreed that they take an active role in maintaining their oral health. On the other hand, maximum (53.0%) were remained neutral about that they generally able to achieve my goals with respect to their oral health and (49.5%) succeed in the projects they undertake to improve their oral health. These findings were slightly similar with the findings of Pradhan A where about 60% of the carers strongly agreed that they take responsibility in caring for their care recipients‟ oral health and are able to do things as well as most other people. Furthermore, only 55% of the carers strongly agreed that they take an active role in maintaining their care recipients‟ oral health. A much lower 40% of the carers strongly agreed that they are generally able to achieve their goals and succeed in the projects they undertake to improve the oral health of their care recipients (Pradhan A 2012). These differences indicate that the outcomes did not depend on an individual carer alone, but on all carers for that care recepients.

In case of carer activation measure (knowledge), maximum had knowledge about (56.2%) how to prevent further oral health problems and (43.2%) about understand their oral health problems and what causes them. On the other hand, maximum remained neutral about (49.7%) known what treatments are available for their oral health problems and about (47.6%) known what each of their prescribed medications do. High carer activation measure -knowledge showed more dental visit by carers (P<.05) but not related with brushing frequency (P>.05) But in case of Pradhan A study only 22–39% of carers strongly agreed that they knew or understood oral health problems, causes, available treatments, prescribed medications and how to prevent further oral health problems (Pradhan A, 2012).

In case of carer activation measure (skills), most of the carers agreed about that (73.0%) they carefully follow any instructions of their dental professional gives them about home-care and (80.0%) take responsibility in caring for their oral health and also (62.7%) take an active role in maintaining for their oral health high CAM-skill showed more brushing frequency twice a day (P<.05) but not related with dental visit pattern (P>.05). But in case of Pradhan A study here was a higher proportion of carers (55–72%) in strong agreement (Pradhan A, 2012).

In case of carer activation measure (confidence), majority of the carer agreed that (67.6%) they are confident about the need to go to the dentist, (71.4%) maintain a healthy diet, (73.0%) figure out solutions when new problems arise with their child's oral health condition and also (68.4%) can maintain a healthy diet for their child during times of stress. On the other hand, maximum of the carer were confident that (41.4%) they can tell a dentist about their possible dental concerns and also (30.3%) can help to prevent or reduce their oral health problems. High carer activation measure - confidence showed more dental visit by carers (P=.05) but not related with brushing frequency (P>.05), these findings were differ from the study conducted by Pradhan A where 32–45% of carers strongly agreed that they are confident about the need to go the dentist, tell about the possible dental concerns, help prevent or reduce the oral health problems, maintain a healthy diet, even during times of stress, and figure out solutions when new problems arise with the oral health condition for their care recipients.

In this present study it also appears that, Carer dental efficacy (CDE) and Carer oral health competency (COHC) scores ranged from 11.00 – 23.00. Mean of CDE is 16.6 and COHC is 17.9. The median scores for CDE and COHC is 16 and 18 respectively. Carers CAM – knowledge score ranged from 7.00-17.00. (mean= 12.3) CAM-skill score and CAM-confidence score respectively ranged from 9.00-15.00 (mean=12.3) and 18.00-28.00 (mean=22.5). The median score for CAM-knowledge is 12, for CAM-skills is also 12 and for CAM- confidence is 23. These median scores indicate that the data are skewed towards the higher scores.

In Pradhan A study CDE and COHC scores ranged from 15.0–25.0 (mean = 22.2 for CDE and 22.0 for COHC). CAM scores ranged from 31.0–65.0 (mean = 54.4). The median scores of 23.0, 22.0 and 54.0 for CDE, COHC, and CAM respectively, indicated that the data were skewed towards the higher scores. Carers‟ CAM-Knowledge, CAM-Skills and CAM-Confidence scores ranged from 7.0–20.0 (mean = 15.9), 9.0–

15.0 (mean = 13.7), 12.0–30.0 (mean = 24.8) respectively. The median scores of 16.0, 14.0 and 25.0 for CAM-Knowledge, CAM-Skills and CAM-Confidence indicated that the data were skewed towards the higher scores. Due to the skewed nature of the distributions for each of the psycho-social measures, a median split was used to dichotomise each of the variables for further analyses (Pradhan A, 2012).

Findings related to the Oral health literacy

From this study we found that, reading comprehension scores ranged from 1-6 (mean=4.1). Numeracy score ranged from 2-4 (mean=3.7). Listening scores ranged from 1-2 (mean = 1.6). Appropriate decision-making scores ranged from 0-5 (mean=2.5). Lowest score 0 is obtained from appropriate decision-making skills. Those who had more literacy about oral health their tooth brushing frequency twice a day was more (P<.05) but in another study conducted by Pradhan A, Comprehension score ranged from 16.7-50.0 (mean=41.7), numeracy score ranged from 30.0-50.0 (mean=46.2), Oral health literacy (OHL) score ranged from 56.7-1000 (mean=87.9) (Pradhan A, 2012) this indicates there was a need to ensure information given to carers on dental visits, completing medical history and consent form, home care instructions and general information on accessing dental care is clearly communicated verbally and in writing. After scoring oral health literacy variables we found that majority of the carers (64.4%) had adequate oral health literacy, 28.6% had marginal literacy about oral health and 7.0% of the carers had inadequate literacy. These findings were not similar with the study of Sistani N et al, where all the participants 35% had OHL-AQ scores classified as inadequate, 25% as marginal, and 40% as adequate. All questions in the numeracy and listening sections were answered correctly by 60 to 90% of the respondents and under 55% answered correctly to four of the five questions in the decision-making section. (Sistani N et al, 2013) that indicates indicated low oral health literacy level among Iranian adults then current study samples.

Conclusion

Based on the main findings of the study, with reference to the three specific aims, the following conclusions were drawn. The main objectives of the study were to assess the relation of oral health literacy and psychosocial factors with dental behavior of child carers. The study populations were the carer of the child studying in playgroup to class V of Mohammadpur Preparatory School and Mohammadpur model school of Dhaka city during January2015 –December 2015.From this study we found that, majority of the carers (64.4%) had adequate oral health literacy, 28.6% had marginal literacy about oral health and 7.0% of the carers had inadequate literacy. These findings indicate that most of the carers had adequate literacy about oral health in the study area. Carers are responsible for communicating with health care providers, organizing appointments and medications and making treatment decisions and providing consent on behalf of their child. But in this study lowest score 0 is obtained from appropriate decision-making skills. CAM- knowledge and CAM-confidence associated with frequency of dental visit and CAM-skill associated with brushing frequency. These oral health literacy and psycho-social factors may be enhanced by providing encouragement and positive reinforcement to carers, and by specific educational interventions. Focus should also be on the socio-structural barriers to the improvement of dental behaviours and oral health outcomes. Providing such support and guidance to carers may then improve their ability to provide appropriate oral health care for their care recipients.

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