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Nurses' knowledge regarding oral and dental health across the life span: A survey study"

Basma Mohamed Osman¹, Effat Elkarmalawy¹, Heba Magdy Sharaa¹ and Amara Farid²

¹Community Health Nursing, Faculty of Nursing, Cairo University, **Egypt**

²Conservative Dentistry, Faculty of Dentistry, Cairo University, **Egypt**

*Correspondence: Basma_3m@hotmail.com Accepted: 18 Sep, 2018 Published online: 30 Nov. 2018

Oral health promotion is a fundamental need across the whole life course. Aim: the current study aimed to investigate knowledge of oral & dental health across life span among dental nurses. Settings and Design: a cross-sectional survey design was utilized and the study was conducted at the primary health care (PHC) settings. Methods and Materials: Data was collected from 112 nurses using dental nurses' knowledge on oral & dental health promotion across life span questionnaire developed by researcher under main five domains as the following: oral systemic health, oral health during (pregnancy, childhood, adulthood and elderly). Statistical analysis used: Data were analyzed using the descriptive statistics. Results: The majority of nurses have poor knowledge regarding oral health across life span. Most of them didn't receive any oral & dental health topic in their nursing curriculum. Majority of nurses didn't receive any training programs related to oral and dental health in their nursing carrier. Significant relationship was found between nurses' knowledge and years of experience but no significant relationship was detected between total knowledge scores and nurses' age or education. Conclusion: Oral health promotion knowledge was poor among nurses working at primary dental clinic. There was a great need for addressing gaps in nursing education and training regarding oral & dental health. Oral and dental health across lifespan training program regarding was recommended. Also, corporation of oral and dental health topics into the nursing curriculum was highly recommended to improve dental nurses' knowledge at PHC level

Keywords: Oral & dental health, life span, nurses, knowledge.

INTRODUCTION

Oral and dental health is an important component of general health and wellbeing. Oral health promotion is essential to enable individuals to communicate effectively and enjoy a wide range of foods, improves overall quality of life, self-esteem and social confidence. Maintaining good oral health during childhood provides a strong foundation for good oral health in adulthood (Public Health England, 2013).

The first nationwide survey of oral health in Egypt conducted by World Health Organization,

(2015) involved different sectors of the society, including orphanages, school children, adults and pregnant mothers showed that nearly 70% of examined children had some untreated caries experience; meanwhile, 80% were suffering from some form of periodontal disease. Forty percent of participants reported that they experienced dental problems at the time of examination but did not seek a dentist for treatment. 20% had never been to a dentist. Diabetics and smokers were at a higher risk to develop gingival and periodontal problems (WHO [Eastern Mediterranean Regional

Office] WHO EMRO, 2015).

Growing evidence reveals a potential bidirectional relationship between periodontal diseases and several systemic diseases as respiratory disease, cardiovascular disease, cancer and diabetes (Halfon, Forrest, Lerner, & Faustman, 2018). Poor oral health also has been associated with adverse pregnancy outcomes. Tooth decay and periodontal disease are the most common oral diseases, yet they are largely preventable (Kaur. S, Kaur B, 2015). Proper self and professional oral care combined with a healthy lifestyle and avoiding risks, such as high sugar consumption and smoking, make it possible to retain a functioning dentition through life (Baseer, Alenazy, Alasqah, Algabbani, & Mehkari, 2012).

Primary health nurses are more likely to encounter underserved and vulnerable populations than dental professionals, particularly family health and community nurses (Messenger, 2015). As more primary care providers become active in oral health promotion in their practice there can be further growth in the public's awareness of the importance of oral health as it related to overall health. Over time this can eventually help in the reduction in dental disease and ultimately reduce the cost for future dental restoration and dental diseases (Mattheus and Mattheus, 2014)

Although, Nurses, have an important role to play in oral health care as well as overall health and significance at oral health holds. Even so, the training of nurses in oral health and hygiene remains highly variable and inadequate (IOM (Institute of Medicine) and NRC (American National Research Council), 2011). The aim of the current study was to investigate knowledge of oral & dental health promotion across life span among dental nurses working at primary health care (PHC) setting.

MATERIALS AND METHODS

Research Design:

Cross sectional survey design was utilized to dental nurses' knowledge regarding oral and dental health promotion across life span.

Setting:

This study was conducted at (46) PHC centers, Cairo governorate, Egypt including thirty one family medicine centers, nine mother and child health centers and six general clinics which randomly selected through coding all centers

providing primary dental health care services in Cairo (92) then the odd number from centers was randomly selected.

Sample:

A cross-sectional sample of all nurses (112 nurses) working at dental clinics in the previous randomly selected primary health care setting at the period of six months from March 2017 till the end of September 2017 was performed.

Tools of data collection

After reviewing the related literature, Based on the theoretical framework of the Family developmental life cycle theory by Evelyn Duvall, (1957) and The American Oral Health Curriculum "Smiles for Life" designed for primary health care providers to ensure the integration of oral health and primary care, Data collection tool was developed by researcher to assess dental nurses' knowledge regarding oral & dental health across life span as the following: Nurses' knowledge on oral & dental health promotion across life span questionnaire: It consists of (43 questions) distributed in two parts as the following:

The first part- Nurses' demographic characteristics and dental health in nursing practice: it included questions related to: demographic data and questions about oral health in nursing curriculum and career.

The second part – Nurses' knowledge regarding oral & dental health promotion across life span: it was categorized in five domains as the following:

- 1-Oral and systemic health: composed of questions related to the relationship between systemic and periodontal diseases.
- 2-Oral and dental health during pregnancy: questions were related to common oral health problems in pregnancy, dental treatment during pregnancy and effects of oral Disease on pregnancy.
- 3-Oral and dental health during childhood: questions were related to normal dentation, feeding and nutrition, oral hygiene and Early Childhood Caries (ECC).
- 4-Oral and dental health during adulthood: it contained questions related to periodontal Disease, effect of chronic illness on dental health.
- 5-Oral and dental health in elderly: it contains questions regarding, oral changes with aging and common oral diseases in the elderly.

Tools validity and reliability:

The questionnaire items were tested for content validity by a panel of experts in dentistry and community health nursing fields. Each of the experts asked to examine the instrument for content clarity, wording, time duration, format and overall appearance. Based on experts' comments and recommendations, some items had been added, modified and/or cancelled in the tool. Internal consistency and reliability were determined using Cronbach's alpha coefficient of internal consistency was used to estimate the reliability of knowledge questionnaire: Internal consistency using Cronbach's alpha was 0.83.

Statistical design

The data collected from the observations (handoff procedure and continuity of care) were coded and entered into (SPSS), Version 21.0, Statistical analyses were made and all the tests had the significance level of 0.05.

Ethical Consideration:

An official permission to conduct the study was obtained from the ethical committee faculty of nursing, to carry out the study. Another approval was granted from The Human Research Ethics Board Committee (HREBC) of the Central Directorate for Research & Health Development, Training & Research Sector affiliated to the Ministry of Health and Population after reviewing the research tools and discussing the main objectives of the research, ethical consideration.

Participation in the study was voluntary and based on the subjects' acceptance to give informed consent; where informed consent was signed by the participants after reading all its details; the ethical issues, considerations included an explanation of the purpose and nature of the study, the subjects were reassured that they have the right to withdraw at any time, and the information wouldn't be accessed by any other party without taking permission from them.

RESULTS

Table (1) reveals that the study subjects consist of 112 nurses, More than half of nurses (53.6%) aged between 23 to less than 28 years old with a mean age = 26.150±1.731. Regarding educational level, less than three quarters (71.4%)

of nurses completed the secondary nursing school. More than one third of nurses (35.7%) have from five to less than ten years of experience in nursing carrier with mean years of experience= 4.46 ±1.40.

Table 1: Distribution of nurses regarding their demographic characteristics (N=112)

Demographic characteristics	No.112	%
Nurses' age		
18-	26	23.2
23-	60	53.6
28-	15	13.4
33-	9	8
>37	2	1.8
Mean ± SD	26.150±1.731	
Education		
Diploma nurse	80	71.4
Technical institute	32	28.6
Years of experiences		
0-	33	29.5
2-	20	17.8
4-	25	22.3
6-	14	12.5
8-	20	17.9
Mean ± SD	1.45.±0.58	
Receive Training program on oral and dental health		
Yes	44	39.3
No	68	60.7
Presence of dental health topics in their nursing		
yes	7	6.3
no	105	93.8
Incorporation of dental health into nursing curriculum		
yes	30	26.8
no	82	73.2

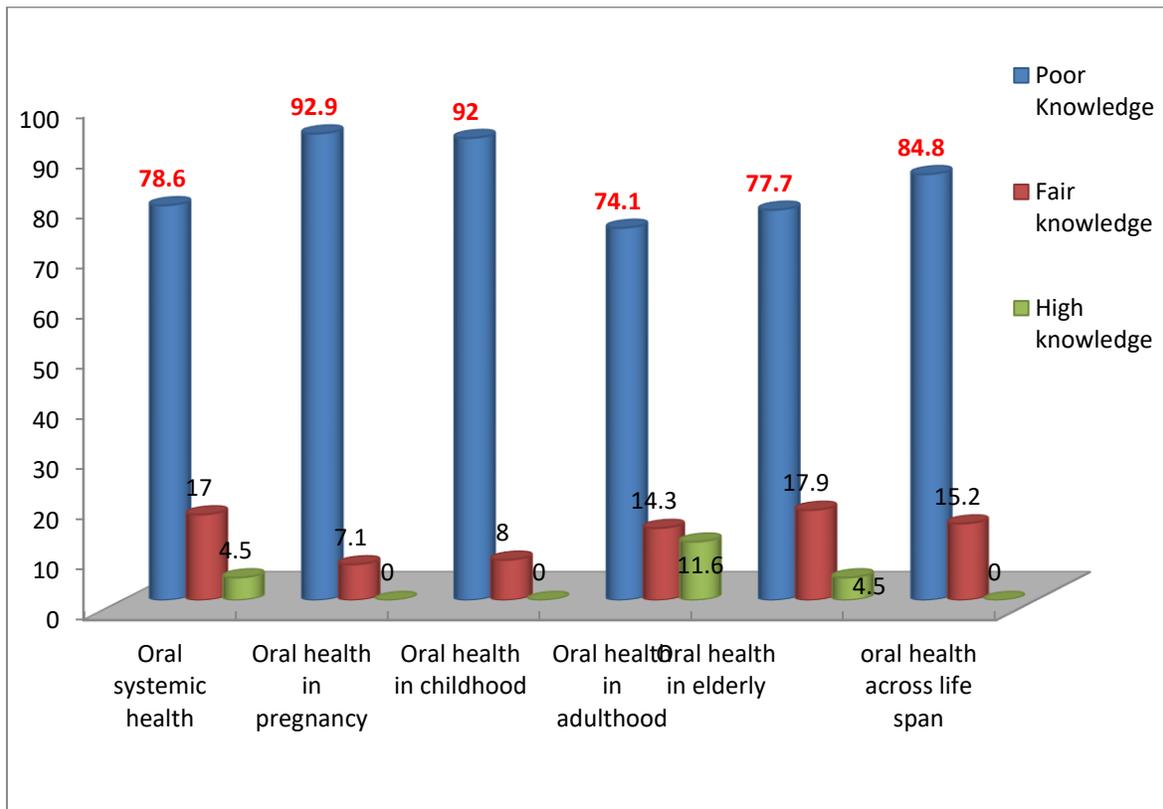


Figure 1: Distribution of nurses regarding their total knowledge scores on oral & dental health promotion (N=112)

Table2: Relationship between nurses' oral & dental health promotion knowledge and their demographic characteristics (N=112).

Demographic characteristics			Oral & dental health promotion knowledge		Fisher's Exact Test:	Degree of freedom	P-value
			Low knowledge	fair knowledge			
Age	18 < 28	no	66	20	5.54	8	0.7129
		%	76.7%	23.3%			
	28-	no	18	8			
		%	69.2%	30.8%			
Education	2dry nursing school	no	70	10	1.60	1	0.21
		%	87.5%	12.5%			
	Tech. institute	no	26	6			
		%	81.3%	18.8%			
Yrs. of Experience	0<4	no	43	10	7.67	10	.04*
		%	81.1%	18.9%			
	4-8	no	40	19			
		%	67.8%	32.2%			

Regarding years of experience, near one third of nurses (29.5%) have less than two years of experience and 12.5% have from six to less than eight years of experience with mean years of experience at dental clinic= 1.45 ± 0.58 .

The same table indicates that less than two third of nurses (60.7%) didn't receive any training programs related to oral and dental health as part of the continuous professional development of nurses at primary care level 93.8% of nurses didn't receive any dental health topic in their academic education. The majority of nurses (73.2%) recommended incorporation of dental health into nursing curriculum.

Figure (1) displays that, the majority of nurses (78.6%, 92.9%, 92%, 74.1%, and 77.7%) respectively have low knowledge scores regarding (oral systemic health, oral & dental health promotion during pregnancy, oral and dental health at childhood, oral & dental health at adulthood, oral & dental health in elderly). As regard to total knowledge scores on health promotion across life span, figure (1) reflects that, the majority of nurses (84.8%) have low knowledge and 15.2% have fair knowledge while none of them have high scores.

Table (2) displays that, there's no significant relationship between nurses' age, education and their total knowledge scores on oral and dental health promotion. Percentages of nurses who have fair knowledge are more in more years of experience at primary dental clinic. Furthermore, statistically significant relationship between years of experience at dental clinic and total oral & dental health promotion knowledge at (p - value = 0.04).

DISCUSSION

Distribution of nurses regarding their demographic characteristics:

The findings of the present study revealed that, More than half of nurses aged between 23 to less than 28 years old with a mean age = 26.150 ± 1.731 . Regarding educational level, less than three quarters of nurses completed the secondary nursing school. These results in contrary to a study conducted by Rabiei, Mohebbi, Yazdani, & Virtanen, (2014) aimed to assess primary care nurses' knowledge of oral health care (OHC) and their attitudes toward delivering OHC, as well as to assess their willingness to obtain OHC information. The study reported that, nurses varied in age from 22 to 56 years with mean age= 37 ± 8 and majority of them had higher educational degrees (BS and MS).

Regarding nurses work experience, current study results reported that near one third of nurses have less than two years of work experience with mean years of experience = 1.45 ± 0.58 . These study results were in contrast with the study done by Skeie, Skaret, Espelid, & Misvær, (2011) who found that the mean nurse career experience was 11 years. The difference between two studies results may be due to the inclusion criteria at the current study. Nurses working at primary dental clinic were selected. There's a common work norm that newly hired nursing staff should rotate in the primary dental clinic at the beginning of work to insure orientation with the dental clinic policies, procedures and skills.

Oral and dental health in nursing education and practice

The results of the present study conveyed that majority of nurses didn't receive any dental health topic in their academic education. These study results were in the same stream with the study conducted by Smadi & Nassar, (2017) researchers reported that none of nursing students received structured training or special module regarding oral health.

This lack of integration of oral health and dental education into the nursing curriculum was also confirmed by the study done by Golinveaux et al., (2013) aimed to evaluate the effect of an oral health education program on pediatric nurse practitioner students' knowledge, confidence, attitudes, and behaviors regarding the provision of oral health care to young children during well-child visits at the University of California, San Francisco. The study declared that eighty percent of pediatric nurse practitioner students didn't receive any oral health education in their nursing curriculum.

Furthermore, Current study results reflected that the majority of nurses recommended incorporating dental health into nursing curriculum. These findings were in the same line with the study done by Mohamed¹ & Barnes², (2015) Researchers found that more than eighty percent of nurses think that it was necessary to obtain oral health curriculum education and it is necessary to assess oral health curriculum competence level to pass oral health exam.

Same attitude toward incorporating oral health education course into the nursing curriculum also indicated by Smadi & Nassar, (2017) who stated that approximately eighty five percent of nursing students would like to obtain formal oral health curriculum and to implement

activities during their nursing training and career. This positive attitude toward oral health education did a reflect in the direction but not magnitude of willing to introduce oral health subjects to the curricula of nursing schools and should be met by efforts nursing academics to introduce oral health courses into the curriculum of nursing. Such courses were examined both on undergraduate or postgraduate training their proved efficacy.

For example, the study recently conducted by Cooper et al., (2017) aimed to evaluate changes in knowledge, confidence, attitude, and clinical practice in children's oral health of the students completed an interprofessional practice and education (IPE) course on children's oral health established that offering an interprofessional course on children's oral health to graduate students in dentistry, nursing, and osteopathic medicine can improve their knowledge, confidence, and practice toward children's oral health and expand their professional goals to include caring for underserved, minority children.

Nurses knowledge regarding oral & dental health promotion

Figure (1) showed that, the majority of nurses have low total knowledge scores on oral health promotion during pregnancy and none of them have high knowledge scores. These results were in the same line with the study done by Sharif, Saddki, and Yusoff, (2016) who reported that medical nurses had limited knowledge about oral health and oral health care of pregnant women and certain misunderstandings about oral health were common but contradicting with the findings of the survey conducted by Ehlers, Callaway, Zock, & Willershausen, (2015) aimed to assess midwives' knowledge about oral health and early caries prevention during perinatal care for mothers and babies.

The researchers reported that all of midwives had very good knowledge of caries prevention and oral health, and a high percentage of them passed on information concerning these issues during perinatal care. High variation in knowledge level may be attributed to the quality of the midwives' education in Hesse, Germany as dental topics are integrated in the curriculum of the midwives' education. Furthermore, the midwives see oral health care task as an integral part of their professional duties as reported by the researcher.

Results of current study showed that almost of nurses had low knowledge scores, and none of them have high knowledge scores. These results in agreement with study of Rabiei, Mohebbi, Patja,

& Virtanen, (2012) who showed a great lack of knowledge of pediatric oral health care among primary care nurses working in the public health centers of Tehran. Nurses' lack of knowledge on oral health matters demonstrated in the present study raises questions as to the adequacy of the content being offered on this subject in the nursing curriculum and nursing training programs.

Child health is predictive of adult oral health, nurses working with families at PHC settings should have particular priority focusing on early life interventions to ensure that young children and families are given the best possible start in life. Public health interventions to promote health and well-being in early life need to utilize a range of health education regarding nutrition, oral hygiene and regular checkup for families with children.

As regard to total knowledge scores on oral & dental health at adulthood, present study results revealed that near three quarters of nurses had low knowledge scores. These results were in the same line with the study done by (Odisho & Khan, 2017) who reported that nursing students had limited knowledge in oral diseases regarding development and prevention of dental caries, gingivitis and periodontitis. Added more, several nurses considered that they did not feel ready or were unsure if they have enough knowledge about oral health for their future work.

Regarding to total knowledge scores on geriatric oral & dental health promotion, results of current study revealed that, more than three quarters of nurses had low knowledge while 4.5% have high scores. These results were in contrast with the study done by Reigle, (2016) detected that, more than half of nurses had fair knowledge in the pretest furthermore, knowledge level in posttest increased to seventy five percent. Lack of knowledge among nurses at current study may be due to lack of experience and training regarding elderly oral health.

Regarding oral and dental health promotion across life span total knowledge scores, Current study results reflected that, the majority of nurses had low knowledge while none of them had high knowledge scores. These results were in the same stream with the study done by Smadi & Nassar, (2017) who reported that nursing students had limited dental knowledge related to oral health which will makes them incapable of providing the appropriate care by early detection and prevention of oral disease. Similar findings were reported by Rabiei et al., (2014) who indicated that, only 19% of primary nurses have

fair level of knowledge while the majority of them had poor knowledge regarding oral health.

Also similar results of poor knowledge were demonstrated by Mohamed¹ & Barnes², (2015) who indicated that the knowledge of nurses regarding various aspects of oral health is seriously lacking. From the research investigator point of view, lack of knowledge may be due to inadequate educational input and basic training, variations in regional training or the lack of regular updating training.

These results were less than that study done by Al-Batayneh, Owais, & Khader, (2014) who reported better level in knowledge among 78 nursing students, this difference between current study results and the other study might be explained by more specific questions related to dental diseases in present study compared to more general oral health questions other study. However direct comparison of knowledge level was difficult to ascertain with many other studies due to the different contents of knowledge questions in questionnaires used.

According to results of current study, nurses have to consider the life course nature of oral and dental health. Childhood diet and oral hygiene are related to socioeconomic and psychosocial factors, and that tooth loss is irreversible, adult oral health is rooted in early life conditions, while upward and downward social mobility influences oral health trajectories.

The relationship between Nurses knowledge and their demographic characteristics

Regarding the relationship between the study variables, current study results reflected that no statistically significant relationship was found between nurses' education and their total knowledge scores regarding oral & dental health promotion across life span. These results were in contrary to the study done by Rabiei et al., (2014) who reported that education degree is found a significantly effective factor in the nurses' knowledge of oral health care. This discrepancy may be due to, all of current study subjects with lower level of education and most of them didn't receive any basic educational curriculum regarding oral and dental health. Therefore, this problem must be solved by implementing professional education strategies in nursing academic and professional job career planning.

Current study results displayed that, the frequency of low knowledge are highest in years of experience from 0 to less than 10 years but there's no statistically significant relationship between nurses year of experience in nursing

career and their total knowledge regarding oral & dental health promotion across life span. In the same stream the study conducted by Rabiei et al., (2014) who found that years of professional experience did not significantly influence primary health nurses knowledge regarding oral health.

Also current study results were in agreement with the study done by Kahrman, Karadeniz, Tüzüner, & Kuşgöz, (2017) aimed to evaluate the knowledge of pediatric nurses about the oral health care of newborns and children in Turkey. Researchers indicated that no significant associations between knowledge years of professional experience of nurses in their study.

Results of current study also demonstrated that, Percentages of nurses who had low knowledge were higher among nurses with less years of experience at primary dental clinics and Percentages of nurses who had fair knowledge were more among nurses with more years of experience at primary dental clinic. Furthermore statistically significant relationship between years of experience at dental clinic and total oral & dental health promotion knowledge at (p - value = 0.04). These results were supported by the study done by Wooten, Lee, Boggess, & Wilder, (2011) who reported that significant relationship was detected between years of experience at primary dental clinic and nurses' knowledge regarding periodontal disease.

CONCLUSION

Overall, the study concluded that nurses working at PHC centers have poor knowledge related to oral and dental health promotion across life span. Majority of nurses didn't receive either oral & dental health topic in their academic education or training programs in their nursing career. Significant relationship was found between years of experience and nurses knowledge regarding oral dental health promotion across the life span.

Recommendations

An educational program on oral dental health should be specially developed for dental nurses at primary care level. Further research is needed to explore the facilitating and hindering factors to overcome barriers to incorporate oral health content in nursing curriculum. Another study could be conducted to assess nurses' knowledge regarding oral health promotion in other community settings.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

BMO& HMS designed, collected the study data, Literature search, perform data acquisition and data analysis, Statistical analysis and also wrote the manuscript. EE&AFE defend the intellectual content, perform manuscript editing and reviewed the manuscript. All authors read and approved the final version.

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