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Research Paper

Dental Caries amongst elderly people in a Southern province, Vietnam: A cross-sectional study

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ABSTRACT

The present study aimed to investigate the prevalence and association of dental caries amongst elderly people in Can Tho, a Southern Province in Vietnam. A community-based, cross-sectional study amongst 1,350 elderly respondents (aged ≥ 60 years) was conducted using cluster sampling design. Face-to-face questionnaires survey and dental examination were used to evaluate the prevalence of dental caries. The criteria used to assess dental caries were decayed teeth with crown or root caries (DT), missing teeth due to caries (MT), filled teeth due to caries (FT), decayed and filled teeth (DFT) and decayed, missing and filled teeth (DMFT) index. Prevalence of dental caries was 32.5% amongst elderly people (a mean DFT around 1.06 and DMFT around 13 teeth per person). Logistic regression analysis indicated significant and positive association with the odds of dental caries amongst elderly females (OR=1.21; 95% CI=1.15 to 1.28), and elderly people aged 60 to 64 years (OR=2.15; 95% CI=1.82 to 2.47). Elderly people who were previously government officials was inversely associated with the odds of dental caries (OR=0.68; 95% CI= 0.52 to 0.80). In conclusion, dental caries is still a common and frequently-occurring disease amongst elderly people in Southern Vietnam despite the decreased trend of the disease. The current study provided representative data on oral health status amongst the elderly people in urban areas in Southern Vietnam.

Keywords: Elderly, dental health survey, dental caries, oral health, Vietnam.

INTRODUCTION

Despite great successes in improving the oral health of populations globally, dental caries still remains a major oral health condition amongst elderly people (Barmes, 1999). Population-based studies amongst community-dwelling people have shown that dental caries is remarkably common amongst older people with a prevalence rate from a half to three-fourths (Anusavice, 2002; Bourgeois et al., 1998; Liu et al., 2013).

Dental caries can result in pain and chewing difficulties, thus, decreasing the overall health and quality of life. In developing countries, little information about oral health status and oral health service is available. Thus, research urges the need to conduct epidemiological research to provide further insights on the current situation of the diseases and conditions given that oral health amongst elderly people in developing countries should be prioritized (Barmes, 1999).

Vietnam is a lower middle income country in Southeast Asian with about two-thirds of the population living in rural areas (General Statistic Office of Vietnam, 2016). The current oral health status of the elderly population has not been well documented. According to the National Oral Health Study of Vietnam in 1999, prevalence of caries amongst adults aged ≥ 45 years is as high as 78% (Loc et al., 2011). Recently, aging population, which accounts for more than 11% of the country's population (General Statistic Office of Vietnam, 2016) is becoming a major challenge for social and economic development and sustainability.

Alongside the inexorable growth of older people, a dental transition has been occurring in Vietnam. Unfortunately, there has been scarce data on dental caries amongst the elderly people in Vietnam (Campbell and Graham, 2006). Studies conducted in elderly people could be a valuable contribution in identifying the situation and thus providing evidence for preventive strategies.

There are insufficient dental resources in Vietnam (Loc et al., 2011; Nguyen et al., 2010). Most dental practices are located in urban areas and only few rural residents have access to any dental health services (van Palenstein et al., 2000). The importance of appropriate oral health care interventions is widely recognized. The present cross-sectional study aimed to estimate the prevalence of dental caries amongst elderly people in Southern Vietnam, while the second aim was to analyze the influence of several socio-demographic variables on dental caries amongst elderly people.

MATERIALS AND METHODS

Sampling

This cross-sectional study applied a cluster sampling design to draw 1,350 elderly respondents aged ≥ 60 years in Can Tho province, a Southern province in Vietnam. This urban province was chosen for the reason that it was considered representative for the urban population of Southern Vietnam. Thereafter, three districts and five communes in each of these districts were randomly selected. Finally, from each commune, 45 respondents were randomly selected from lists of elderly people. Data for this study were collected in 2015.

Data collection tools

After obtaining verbal consent, respondents were asked to complete a face-to-face interview to collect their background characteristics. Background variables comprised of age, gender, marital status, education attainment, and income level.

Following the completion of the interview, dental examination was carried out for all respondents [http://www.who.int/oral_health/publications/9789241548649/en/]. The WHO criteria were employed to assess tooth status (decayed teeth with crown or root caries (DT), missing teeth due to caries (MT) and filled teeth due to caries (FT). [http://www.who.int/oral_health/publications/9789241548649/en/]. Decayed and filled teeth (DFT) (sum of DT and FT) and decayed, missing, and filled teeth (DMFT) index (sum of all the DT, MT and FT) were also calculated. The prevalence of dental caries was counted as the percentage of respondents who suffered from crown or root caries to the total number of respondents.

Statistical analysis

Data was entered using EpiData 3.0 and analyzed with SPSS 16.0. For continuous variables, T-test (for normally distributed variables) or Mann-Whitney test (for non-normally distributed variables) was used for comparison in two groups. Kolmogorov-Smirnov was applied to test normality prior to these tests. For categorical variables, chi (χ^2) square tests were applied (McDonald, 2009). When the expected values in any of the cells of a contingency table are below 5, Fisher's exact test was calculated as it is more accurate than the χ^2 test in this situation (McDonald, 2009). Statistical significance was considered if p-value was <0.05. To identify possible risk factors for dental caries, univariate analysis (χ^2 - chi square test) was conducted for background variables (age, gender, marital status, education attainment and income level). The significant variables were included in the final multivariate logistic regression analysis in which the dental caries status was the dependent variable.

Ethical consideration

Ethical clearance was obtained from the institutional review board of Hanoi Medical University. Ethical guidelines were followed and respondents recruited after obtaining informed written consent. The target population included all elderly people who were present during the study.

RESULTS

Sample characteristics

Table 1 shows the study sample characteristics. A total of 1,350 respondents completed the face-to-face interviews and were consequently examined with dental caries. Significantly, more females took part in the survey as compared to males. The rural population was much lower than urban population in this study. Respondents with lower education and lower income were also significantly higher.

Prevalence of dental caries

Amongst all 1,350 elderly people participated in this study, about a third (32.5%) had some decayed, missing, or filled teeth with a mean DFT around 1.06 and DMFT around 13 teeth per person (Table 2). Table 1 shows that elderly females were significantly more likely to have the disease

Table 1: Univariate analysis of background characteristics in relation to prevalence of dental caries in the elderly people in a Southern province, Vietnam.

S/No.	Variable	Dental caries		Total	p (χ^2)
		N	%	N = 1350	
	Sex				
1	Male	160	28.9	554	p=0.017*
	Female	279	35.1	796	χ^2=5.67
	Age				
2	60-64	156	39.1	399	p=0.001**
	65-74	175	32.1	546	χ^2=14.24
	≥75	108	26.7	405	
	Living areas				
3	Rural areas	122	31.2	390	p=0.536
	Urban areas	317	33.0	960	χ^2=0.38
	Educational level				
4	Secondary school and under	103	37.6	274	p=0.045*
	High school and higher	336	31.2	1076	χ^2=4.03
	Previous occupation				
5	Simple work (housework, farming, unemployment)	409	33.6	1218	p=0.011*
	Government officials	30	22.7	132	χ^2=6.39
	Household economic				
6	Poor and near poor	324	31.1	1042	p=0.039*
	Average and rich	115	37.3	308	χ^2=4.22

*p< 0.05; **p< 0.01.

Table 2: Dentition status of elderly people in a Southern province, Vietnam population.

Dental caries		DT		MT		FT		DFT		DMFT	
n	%	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD
439	32.5	1311	0.97 ± 1.93	16682	12.36 ± 9.86	125	0.09 ± 0.89	1436	1.06 ± 2.82	18118	13.41 ± 9.58

Abbreviations: DT: decayed teeth with crown or root caries, **MT:** Missing teeth due to caries, **FT:** Filled teeth due to caries, **DFT:** Decayed and filled teeth, **DMFT:** Decayed, missing, and filled teeth, **SD:** Standard deviation.

Table 3: Multivariate logistic regression analysis of background characteristics to prevalence of dental caries amongst elderly people in a Southern province, Vietnam.

S/No.	Variable	β	SE	OR	95% CI	p
1	Female	0.54	0.13	1.21	1.15-1.28	0.025*
2	Aged 60-64 years	0.61	0.20	2.15	1.82-2.47	0.001**
3	Attaining high school and higher	0.38	0.30	0.95	0.90-1.02	0.055
4	Being government officials	0.64	0.20	0.68	0.52-0.80	0.001**
5	Have average or higher income level	0.45	0.20	1.10	1.00-1.21	0.050

*p< 0.05, **p <0.01. **β:** Regression coefficient; **SE:** Standard error; **OR:** Odds ratio; **CI:** Confidence interval.

than elderly males. The youngest aging group (60 to 64 years old) was the group with highest prevalence of dental caries. Elderly groups with lower income, doing simple work previously and attaining lower education tended to have higher disease prevalence. No significant difference was observed between respondents in urban areas (31.2%) and rural areas (33.0%).

Association of dental caries in the study population

In the multivariate logistic regression analysis, government officials were negatively associated with the odds of dental caries (OR=0.68; 95% CI=0.52 to 0.80), while females (OR=1.21; 95% CI=1.15 to 1.28) aged 60 to 64 years (OR=2.15; 95% CI=1.82 to 2.47) were positively associated with the odds of the disease (Table 3).

DISCUSSION

This study aimed to investigate the dental caries of a large-scale sample of elderly people living in an urban province in Southern Vietnam. The sampling procedure was conducted using the method design employed in epidemiological surveys with the aim to assure the representativeness of the study. Although the sample cannot be considered to be representative for Southern Vietnam, our findings can be considered as representative of the elderly people in urban provinces in Southern Vietnam.

The prevalence of dental caries was 32.5% amongst elderly people in Southern Vietnam. Our findings is much lower than those observed in previous studies conducted in Southern Vietnam (>60%) (Nguyen et al., 2010) in other developing countries such as China (>65%) (Liu et al., 2013). India (65%) (Shah and Sundaram, 2004) and developed countries such as Canada (50%) (Arpin et al., 2008). In addition, the DFT and DMFT index in our study is lower than that reported in adult population of Western countries (Winn et al., 1996; Spencer et al., 1994) and other Asian countries (Liu et al., 2013; Shah and Sundaram, 2004). This suggested that dental caries was still a common and frequently-occurring disease in Southern Vietnam despite the decreased trend of prevalence of the disease.

As an independent municipality in Vietnam, Can Tho was one of the most advanced urban provinces of Southern Vietnam. The availability of dental services and oral hygiene might have resulted in the decreased prevalence of dental caries in this province. The rapid economic growth significantly improves the people's health care, lifestyle and behaviours, which might have affected the behaviours of oral health amongst the elderly people in urban areas (Barmes, 1999).

Moreover, there could also be other factors facilitating the accessibility of elderly people to dental care, including geographical proximity and the availability of transportation (public and private vehicles). Jointly, these factors could facilitate the access to dental care services by elderly people in our study, who mostly lived in urban areas and thus lead to a lower prevalence of dental caries.

Prevalence of dental caries amongst elderly people was not significantly different from dental caries in urban and rural areas. Our findings are not in line with two previous population-based studies in Vietnam where the oral health status of the adult population was strongly related to geographical location (Loc et al., 2011; Nguyen et al., 2010). However, recent evidences in other developing countries suggested that the differences in prevalence of dental caries between urban and rural areas are narrowing along with the socio-economic development (Winn et al., 1996; World Health Organization, 2015). The socio-economic development in rural areas could lead to changes in healthy behaviours such as diet and lifestyle amongst elderly people in rural areas.

The present survey showed that prevalence of dental caries in the elderly females was higher in elderly males (OR=1.21; 95% CI=1.15 to 1.28), which is in accordance with results from other studies conducted in Asian countries (Shah and Sundaram, 2004; Arpin et al., 2008). This could be due to longer life span and lower rate of missing teeth amongst the elderly females than the elderly males. Furthermore, elderly people aged 60 to 64 years were significantly and positively associated with the higher odds of dental caries than that of older people. The low prevalence of dental caries in older population could be due to the fact that most of the elderly people prefer to remove the decayed tooth rather than having it restored. This posed a challenge to the local health authorities and called

on further efforts to raise attention to oral health in the elderly females and elderly people aged 60 to 64 years. Oral health education and health promotion program should orient to the elderly people aged 60 to 64 years or even younger population.

Conclusions

The current study aimed to explore the dental caries of elderly people living in an urban province in Southern Vietnam. The prevalence of dental caries was 32.5% in elderly people. This suggested that dental caries is still a common and frequently-occurring disease amongst the elderly people in Southern Vietnam. This study was conducted with a large sample size, which was adequate to gain general estimates of dental caries and the association of background characteristics. With a cluster sampling strategy for data collection, the studied respondents were expected to be reasonably representative for elderly people in urban areas in Southern Vietnam.

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