

Sinking Teeth into Dental Health of Older Adults in Jamaica

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ABSTRACT

Objectives: To describe the prevalence of tooth loss, denture use and dental care utilization among older persons by age, gender, union, residence, education, chronic illness and health insurance status and to identify independent predictors of dental service use and tooth loss.

Methods: A cross-sectional survey utilizing a nationally representative sample of 2943 older persons in Jamaica was conducted. Data related to tooth loss, dental care use and sociodemographic data were obtained. Relationships between variables were assessed in bivariate analyses and logistic regression models subsequently developed to identify predictors of tooth loss and dental care use.

Results: Tooth loss (any) prevalence was 94% and among those who reported tooth loss, 61.1% had dentures: the majority of those with dentures reported using them. Non-use was mainly related to damaged denture or discomfort. Only 35% of persons reported a dental visit within the last 12 months. Age, union status and educational level were significant predictors of both tooth loss and dental visit within the past year. Additionally, gender, residence and having health insurance predicted dental care utilization.

Conclusion: Dental health issues are important in the care of older persons and assume increasing relevance given rapid ageing of the population. Jamaica must craft strategies to address emergent needs in its response to the challenges of oral healthcare for older persons.

Keywords: Dental health, oral health, older persons, Jamaica

Compromiso Entusiasta con la Salud Dental de los Adultos Mayores en Jamaica

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RESUMEN

Objetivos: Describir la prevalencia de la pérdida de dientes, el uso de prótesis dentales, y la utilización de la atención dental entre las personas mayores por edad, género, estado civil, residencia, educación, enfermedad crónica, y posesión de seguro médico, e identificar predictores independientes de la utilización de la atención dental, así como de la pérdida de dientes.

Métodos: Se realizó una encuesta transversal utilizando una muestra representativa de 2943 personas de edad a nivel nacional en Jamaica. Se obtuvo datos sobre la pérdida de dientes, el uso de los servicios dentales, y la demografía. Las relaciones entre las variables se evaluaron en análisis bivariados y modelos de regresión logística desarrollados posteriormente para identificar los predictores de la pérdida de dientes y la utilización de la atención dental.

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Resultados: La prevalencia de la pérdida de dientes (cualesquiera) fue 94%, y entre los que informaron pérdida de dientes, un 61.1% utilizaban prótesis dentales: la mayoría de los que utilizaban prótesis dentales reportaron su uso. El no uso se relacionó principalmente con prótesis dentales dañadas o molestias. Sólo el 35% de las personas reportaron una visita dental en los últimos 12 meses. La edad, el estado civil, y el nivel educacional fueron predictores significativos de la pérdida de dientes y la visita dental el año anterior. Además, el género, la residencia y la posesión del seguro médico fueron predictores de la utilización de la atención dental.

Conclusión: Los problemas de salud dental son importantes en el cuidado de las personas de edad y adquieren una relevancia creciente dado el rápido envejecimiento de la población. Jamaica debe elaborar estrategias para abordar las necesidades emergentes en su respuesta a los desafíos de la salud oral de las personas mayores.

Palabras clave: Salud dental, salud oral, personas mayores, Jamaica

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INTRODUCTION

The Caribbean has been described as the second most rapidly ageing region of the world (1). In Jamaica, the third largest country in the Caribbean, the proportion of elderly is expected to increase from its current 12% (2) to 16.8% by 2025 (3). As individuals age, they undergo biological and physiological changes which affect tooth form and tooth integrity. These changes include tooth wear and attrition, pigmentation, dental sclerosis, tooth blood supply reduction, calcification, narrowing of root canals and alteration in structure and chemical composition (4, 5).

Age itself is not a risk factor for tooth loss (6). However, factors allied with the ageing process as well as sociodemographic variables have been identified as independent predictors of dental problems in older persons. The literature notes that age, gender, race, education, income, geographic region, chronic disease, frailty, smoking, as well as, health and behaviour factors such as dental services use, having health insurance and perceptions and belief about oral healthcare are determinants of tooth loss and oral health (6–10).

Older persons experience a multiplicity of dental and oral problems. The most commonly reported are periodontitis, tooth loss, dental caries, chronic dry mouth and oral lesions including cancers and pre-cancers (7, 11, 12). These problems are of public health importance because they are prevalent, cause significant morbidity and are costly. Tooth loss prevalence has been reported between 83.5% and 90% in developing country settings (13) and varying rates of edentulism (loss of all teeth) from 3% through to 44% (9, 14) in community based

studies. Infections, pain, malnutrition, challenges with chewing, diction, and esthetics are consequences associated with poor oral health and tooth loss (10, 15). Tooth loss is associated with lower quality of life (16) and can lead to coronary disease, stroke, hypertension, diabetes mellitus and chronic obstructive airway disease (17). Out of pocket dental care expenditures increase with age and are especially challenging for the uninsured (18, 19) and in the United States of America, the cost for dental healthcare has continued to decline for all age groups except for the elderly (19).

Dentures are popular prosthetic devices used by the older population to cope with tooth loss. Denture prevalence of 46% and 54% have been reported in studies from East Asia (20, 21). Having dentures, however, does not guarantee their use as there may be problems with form and fit, irritation, ulceration and poor esthetics being consequences of malaligned or ill-fitting dentures (22).

To date in Jamaica, there are no published, peer-reviewed studies that have focussed on dental and oral health issues in older persons (age 60 years and over). This paper describes the prevalence of tooth loss, denture use and dental care utilization among older persons by age, gender, union, residence, education, chronic illness and health insurance status. Independent predictors of dental service use and tooth loss are identified.

SUBJECTS AND METHODS

In 2012, a nationally representative survey of 2943 persons aged 60 years and above was done to describe the health, lifestyle, and socio-economic status of older

adults in Jamaica and to document health-seeking behaviours in this population. A two-stage cluster sample with a probability proportional to size sampling strategy was used to select participants for the survey. Methodological details of this study have been described elsewhere Mitchell-Fearon *et al*, 2014a; Kathryn Mitchell-Fearon *et al*, 2014b). The questionnaire used contained items pertaining to tooth loss, denture use, oral health problem, dental service utilization and health insurance status in addition to sociodemographic variables.

Data obtained were entered into a database and analysed using the SPSS software, version 20, *p*-values of less than 0.05 were deemed significant. Data were summarized using frequencies and proportions and relationships examined in bivariate analyses. Variables found to be associated with dental service utilization were entered into logistic regression models to identify independent predictors of tooth loss and dental service use. Informed consent was obtained from each subject or proxy person acting with power of attorney. Ethical approval was obtained from The University of the West Indies Ethics Committee, Mona, Jamaica.

RESULTS

Sociodemographic profile

There were 2943 persons in the study, with the majority (52%) being female. The median age of participants was 71 years (IQR = 13 years). The largest proportion (44.1%) of persons was in the age group 60–69 years. As seen in Table 1, there were statistically significant differences in age categories by gender. More females were in the 70–79-year and 80-year and older age categories when compared to males. The majority (74.3%) of respondents lived in urban areas, with statistically more males reporting rural residence. More females compared to males were not in union with regards to education, almost 78% of those surveyed had primary and below as their highest level of education with no differences by gender. Proportionally, more females reported having health insurance and one or more chronic illnesses. The overall prevalence of chronic illness among the respondents was 76%.

Tooth loss

Ninety-four per cent of respondents reported having tooth loss; the majority (52.1%) was female, but no

Table 1: Sociodemographic characteristics by gender

Variables	Gender %(n)		Total	Chi-square <i>p</i> -value
	Male	Female		
Age (years)				
60–69	52.2 (676)	47.8 (618)	100.0 (1294)	
70–79	46.4 (459)	53.6 (530)	100.0 (989)	< 0.001
80 and greater	42.0 (273)	58.0 (377)	100.0 (650)	
Residence				
Rural	57.1 (427)	42.9 (321)	100.0 (748)	< 0.001
Urban	44.8 (969)	55.2 (1195)	100.0 (2164)	
Union status†				
In union	63.4 (690)	36.6 (398)	100.0 (1088)	< 0.001
Not in union	38.8 (714)	61.2 (1126)	100.0 (1840)	
Highest level of education				
Primary and below	47.8 (1085)	52.2 (1183)	100.0 (2268)	
Secondary	50.0 (181)	50.0 (181)	100.0 (362)	0.735
Post-secondary and tertiary	50.0 (181)	52.4 (152)	100.0 (290)	
Health insurance				
Yes	42.8 (678)	57.2 (905)	100.0 (1583)	< 0.001
No	53.9 (714)	46.1 (611)	100.0 (1325)	
Chronic illness				
None	71.0 (489)	29.0 (200)	100.0 (689)	< 0.001
One or more	41.0 (896)	59.0 (1288)	100.0 (2184)	

† In union – married or living as married/common-law

Not in union – single, separated, divorced and widowed

statistical difference existed by gender. The proportion of persons reporting tooth loss significantly increased by age category. Similar rates of tooth loss were seen among rural (93.2%) and urban (94.9%) residents. Almost 78% of tooth loss occurred in those with primary level education. There was no statistically significant difference in tooth loss among persons with no chronic disease compared to those with one or more chronic diseases, however, significantly more persons without health insurance had tooth loss than those who did. No statistically significant difference in tooth loss was noted by smoking status.

Denture use

Among respondents with tooth loss, 61.1% (n = 1687) reported having dentures. The majority (83.9%, n = 1323) of persons reported using the dentures. Among the 183 persons who had dentures but were not using them, 42.1% (n = 77) indicated that they were either damaged or lost, 37.7% (n = 69) reported discomfort or dissatisfaction with how the denture was made; 9.3% (n = 17)

did not like them or think they were unnecessary. The remaining portion (10.9%) cited maintenance cost and use of dentures for special occasions as reasons for not routinely wearing them. Denture use was not statistically associated with having a dental visit in the last 12 months ($\chi^2 (1) = 3.11, p = 0.078$).

Dental visits

The majority (81.4%, n = 2358) of persons did not report having a problem with the mouth or teeth in the last 12 months. Among those who reported having a problem with the mouth and teeth in the last 12 months (n = 527), 64.3% reported that it affected eating.

Thirty-five per cent of older persons reported having a dental check in the last 12 months. Significantly greater percentages of females, younger old and urban respondents reported a dental visit in the last 12 months, so did persons in union and persons with health insurance. As educational levels increased, the proportion reporting a visit also increased (Table 3).

Table 2: Tooth loss disaggregated by sociodemographic variables

Variables	Tooth Loss % (n)		Total	Chi-square p-value
	Yes	No		
Gender				
Male	93.9 (1321)	6.1 (86)	100.0 (1407)	0.380
Female	94.6 (1148)	5.4 (82)	100.0 (1530)	
Age category (years)				
60–69	92.3 (1193)	7.7 (99)	100.0 (1292)	< 0.001
70–79	95.4 (940)	4.6 (45)	100.0 (985)	
80 and greater	96.6 (628)	3.4 (22)	100.0 (650)	
Area of residence				
Rural	93.2 (696)	6.8 (51)	100.0 (747)	0.154
Urban	94.6 (2043)	5.4 (117)	100.0 (2160)	
Union status				
Not in union	95.4 (1752)	4.6 (85)	100.0 (1837)	0.001
In union	92.4 (1002)	7.6 (83)	100.0 (1085)	
Educational level				
Primary and below	95.0 (2150)	5.0 (113)	100.0 (2263)	< 0.001
Secondary	93.9 (340)	6.1 (22)	100.0 (362)	
Post-secondary and tertiary	88.6 (256)	11.4 (33)	100.0 (289)	
Chronic illness				
None	94.0 (647)	6.0 (41)	100.0 (688)	0.722
One or more	94.4 (2057)	5.6 (122)	100.0 (2179)	
Health insurance				
Yes	94.1 (1488)	5.9 (94)	100.0 (1582)	0.018
No	96.0 (1268)	4.0 (53)	100.0 (1321)	
Ever smoke				
Yes	95.1 (1345)	4.9 (70)	100.0 (1415)	0.072
No	93.5 (1411)	6.5 (98)	100.0 (1509)	

The time since last dental visit ranged from 0–86 years with a median of three years (IQR = 11 years). The median time since last dental visit statistically differed by gender, age category, union status, level of education, area of residence and having health insurance. The pattern and direction of associations of these variables with time since last dental visit mirrored those of having a dental check in the last twelve months. No statistically significant difference was noted by chronic disease status (Table 3).

Independent predictors of tooth loss and dental visits

Logistic regression models subsequently developed, identified significant predictors of tooth loss and dental care visit within the last 12 months. Variables entered in the model were those significantly associated with the outcomes of interest in the bivariate analyses displayed previously in (Tables 2 and 3). Common predictors for tooth loss and dental care visits within the last 12 months were age, union status and educational level. For tooth loss, persons 60–69 years were 64% less likely to report tooth loss than persons > 80 years: persons in union

were 32% less likely than those not in union, while those with primary education and secondary education were approximately, 2.5 and 2.0 times more likely to report tooth loss compared to those with post-secondary/tertiary level education.

Within the last 12 months, the young old (60–69 years) were 1.9 times more likely to have had a dental check compared to the older persons (≥ 80 years) and persons in union were 1.3 times more likely to have had a dental check *vis-à-vis* those not in union. In the past year, respondents with primary level education were 59% less likely to have had a dental visit compared to those with post-secondary/tertiary level education. Females, urban dwelling residents and those with health insurance were 1.28, 1.49 and 1.52 times more likely to have had a dental check in the last year than their referent groups (Table 4).

DISCUSSION

Good oral health is critical to the well-being of older persons. Tooth loss was prevalent among older participants (94%), a figure comparable to those reported from

Table 3: Associations between sociodemographic variables and dental visit within the last 12 months and time since last visit, respectively

Variables	Visit in Last 12 Months % (n)		Chi-square <i>p</i> -value	Median time since last visit (years)	Kruskal-Wallis <i>p</i> -value
	Yes	No			
Gender					
Male	31.5 (321)	68.5 (698)	0.005	4	0.002
Female	37.5 (377)	62.5 (629)		3	
Age category (years)					
60–69	38.6 (362)	61.4 (607)	< 0.001	2	< 0.001
70–79	32.6 (216)	67.4 (447)		4	
80 and greater	26.6 (97)	73.4 (288)		6	
Area of residence					
Rural	25.7 (137)	74.3 (396)	< 0.001	5	< 0.001
Urban	37.5 (551)	62.5 (920)		3	
Union status					
Not in union	31.9 (382)	68.1 (816)	0.004	4	< 0.001
In union	38.0 (311)	62.0 (507)		3	
Educational level					
Primary and below	29.3 (442)	70.7 (1069)	< 0.001	4	< 0.001
Secondary	45.0 (121)	55.0 (148)		2	
Post-secondary/ tertiary	55.9 (132)	44.1 (104)		1	
Chronic illness					
None	64.6 (968)	35.4 (531)	0.172	4	0.151
One or more	68.0 (323)	32.0 (152)		3	
Health insurance					
Yes	40.3 (461)	59.7 (683)	< 0.001	2	< 0.001
No	26.3 (225)	73.7 (630)		5	

Table 4: Predictors and odds ratios of (a) tooth loss and (b) dental check within the last 12 months

Variable	Tooth loss			Dental check within the last 12 months		
	B	SE	OR (95% CI)	B	SE	OR (95% CI)
Age Category (years)						
60–69	-1.018	0.28	0.36 (0.21 -0.63)*	0.642	0.147	1.9 (1.43 - 2.54)*
70–79	-0.290	0.31	0.75 (0.41 -1.37)	0.287	0.156	1.33 (0.98 -1.81)
80 and greater	-	-	Reference	-	-	Reference
Union status						
Not in union	-	-	Reference	-	-	Reference
In union	-0.392	0.18	0.68 (0.48 - 0.95)*	0.265	1.05	1.30 (1.06 - 1.60)*
Educational level						
Primary and below	0.920	0.22	2.51 (1.62 - 3.88)*	-0.896	0.150	0.41 (0.31 - 0.55)*
Secondary	0.667	0.30	1.95 (1.09 -3.49)*	-0.293	0.185	0.75 (0.52 - 1.07)
Post-secondary/ tertiary	-	-	Reference	-	-	Reference
Health insurance						
Yes	- 0.342	0.18	0.71 (0.50 - 1.02)	0.458	0.110	1.52 (1.19 - 1.95)*
No	-	-	Reference	-	-	Reference
Gender						
Male	-	-	Reference	-	-	Reference
Female	-	-	Reference	0.250	0.104	1.28 (1.05 - 1.57)*
Area of residence						
Rural	-	-	Reference	-	-	Reference
Urban	-	-	Reference	0.396	0.122	1.49 (1.17 - 1.89)*

*denotes significant predictors at the 0.05 alpha level

NB: Gender and area of residence not entered into regression model for tooth loss as they were not significant in bivariate analyses

previous developing country studies (13), but higher than related statistics (79%) from the United Kingdom (25). Tooth loss is a common measure of oral health in a population and therefore, the high local prevalence of tooth loss among older persons demands attention. Having dentures was, in contrast, reported by only 61.1% of those with tooth loss and the routine use of dentures even lower. Lack of appropriate use of dentures can compromise nutrition intake and quality of life of older persons (26, 27) and in our study, problems with the mouth, teeth and dentures were reported to negatively impact eating. Given the study findings, denture use in Jamaica warrants inquiry. Efforts to address the factors associated with non-use such as discomfort and care of the denture to avoid damage may improve usage and enhance overall elder health.

Regular dental check-ups are recommended, the frequency varying according to individual profile and health conditions. However, a useful rule of thumb is one to two visits per annum (28). Only 35% reported a dental check within the last twelve months and the median time since last visit was three years, indicating sub-optimal dental care utilization among older persons in Jamaica. Possible reasons for this include accessibility barriers (cost and

availability), lack of awareness of the importance of oral health and fear of dental treatment (15). In the Jamaican context, accessibility barriers may be present since lack of health insurance and rural residence were factors associated with non-visit for dental care in the last 12 months. Additionally, lower level of education, found in our study to be an independent risk factor for dental care utilization and tooth loss, may exert its influence by mediating socioeconomic variables (example, income and participation in health insurance schemes) as well as cultural attitudes towards dental care.

Union status was a predictor of both dental care visit and tooth loss. The association may reflect partner support and motivation to maintain good health inclusive of oral health. Partners may also identify oral health problems more readily due to better visualization of the oral cavity. Being in an intimate relationship may stimulate better self-care and personal hygiene, indirectly contributing to better dental health and dental service utilization.

The age gradient observed in our study is consistent with biologically purported changes which increase tooth damage and loss. Other conditions (such as arthropathies, stroke and dementia) which occur in tandem with ageing may affect mobility, accessibility,

and performance of instrumental activities of daily living and ultimately affect dental self-care and ability to seek care for dental-related issues.

Strategies to address oral and dental care issues among older persons cannot be divorced from macro-level public health efforts to improve health. Public health and gerontology must embrace gerodontology! The basic public health package of services for older persons should include quality dental services. The current low dentist to population ratio (0.34 dentists per 10 000 population) in the public sector (29) will over-time need to be increased. Expanding health insurance benefits to cover dental care should be considered with implementation on a phased basis in light of cost. In clinical practice, dental examination should be rightly recognized as a critical component of the comprehensive assessment of an older person. At the micro-level, individuals need to embrace good oral health practices throughout the life course to prevent and mitigate oral health problems in later life. Dietary planning and meal preparation should take into account individual's dentition and oral health to reduce nutrition-related problems.

Good oral health improves self-esteem, facilitates social interaction and reduces social isolation at all ages. The challenges of providing quality oral health-care are likely to increase with population ageing, as a result, the application of active ageing which seeks to seize the opportunities to optimize health is critical (30). Developing countries like Jamaica must be proactive about dental care in older persons.

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AUTHOR CONTRIBUTIONS

C Thompson performed statistical analyses, and wrote the manuscript. K James participated in study design, performed statistical analyses, and contributed to manuscript writing. D Holder-Nevins contributed to the statistical analysis and writing. D Eldemire-Shearer participated in study design and contributed to manuscript writing. D Willie-Tyndale contributed to the statistical analysis and writing. All authors approved the final version. The authors declare that they have no conflicts of interest.

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