Oral condition, treatment needs and demands of geriatric "Denture Wearers" in three different Jordanian communities

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ABSTRACT

Objective: To study basic clinical findings, treatment needs and demands in a three communities' population of a geriatric "Denture Wearers", aged 65 years or over on attendance for follow up at the prosthetic clinic in three different main referral military hospitals in the three main territories in Jordan.

Methods: A random sample of 2409 subjects from three different communities who attended the prosthetic clinic at three different military hospitals in Jordan were selected on the basis of their age ($\geq$ 65 years) who has been wearing complete dentures for more than 6 months period. The assessment of oral and general status was based on questionnaire adopted from criteria used in the WHO Manual 1997, detailed history, medical records and intraoral examination. Dentures were evaluated for retention, stability, occlusion, soft and hard deposits and any obvious damage; and oral mucosa was examined for the presence of any pathological change.

Results: Among subjects studied, the condition of the complete dentures worn by many of the patients was unsatisfactory and about (36.2%) needed denture replacement. High proportion (39.7%) of the subjects had lesions of the oral mucosa. Denture needs for male and female elderly was significantly different (P <0.05) and it was almost twice in rural geriatrics (69.5%) when compared with urban geriatrics (31.6%). Both location and age group were highly significant correlated with denture needs. (47%) complain from loose denture and this was increased with age. (39.1%) complained of oral pain and (13.6%) claimed to have difficulty in chewing. Also, (25%) of the subjects were mainly embarrassed by being wearing removable prostheses, while (13.5%) were embarrassed by their dentures dropping during social contact. More than (37%) of the dentures showed hard and/or soft deposits. About (25.7%) of the "denture patients" were not satisfied with their denture and wished an adjustment or a new one.

Conclusion: The present study demonstrated that among geriatric "Denture Wearers" living in three different Jordanian communities, prevalence of oral lesion, treatment needs and patients' demands is relatively high. It reinforces the notion that continuous provision of preventive and educational strategies essential.

Keywords: Denture status, denture wearers, geriodontology, oral mucosal lesions.

Introduction

Interest in the provision of care for the elderly began in the 1960s, when the two federally sponsored health programs, medical and Medicare underscored the enormous and disproportionate cost of health services to this group.[1] The catalysts for this are the rising proportion of the older people, the psychological effects of tooth loss between elderly people, the increase of age-related

diseases and problems (e.g. edentulousness),[2] also because of the finding of the majority of the studies which assessed the dental health of the elderly as being very poor and many of them are in need to dental treatment and follow up.[3-5]

Studies have demonstrated that a large number of people still depend on removable dentures for oral function.[6,7] In fact, adequate complete dentures are capable of restoring function and promoting social and psychological well being.[8] Although, patient ability to wear and adapt any removable prosthesis is still a challenge in the prosthetic treatment [9] and the majority of these prosthesis are in an unsatisfactory condition for use which compromises oral health, with impact on quality of life.[10]

Geriatric denture wearers assessed their dental prosthesis from the point of view of their personal satisfaction and demands comfortable dentures without considering the technical criteria and scientific base of the adequate dentures. Thus the patients' satisfaction is a strong determinant of success in complete denture patients and should be considered during treatment and follow up.

Moreover, oral lesions, such as stomatitis, inflammatory hyperplasia, traumatic ulcers and angular cheilitis are directly associated with the use of inadequate dentures and should be treated if they are detected by routine oral check up or from patients' complains. [11]

This study reports the basic clinical findings, treatment needs and demands in a three communities' population of a geriatric "Denture Wearers", aged 65 years or over. It compares the findings according to residence, age, gender, and social status. This research intended to study the oral health status, treatment needs and patients demands of a group of geriatric 'Denture Wearers' to high light some of the major social and geographical variations so that future trends in health and management strategies can be improved.

Methods

Geriatric 'Denture wearers' aged 65 years and over who attended the prosthetic clinics at three main referral military hospitals in three different locations of Jordan (i.e; King Hussein Medical Hospital in Amman at the middle of Jordan, Prince Rashid Ben Al-Hassan in Irbid at the north of Jordan and Prince Ali Ben Al-Hussein in Al-Karak at the south of Jordan) were sampled for this study and distributed according age, gender, medical status, social group. All participants were edentulous and wearing upper and lower complete dentures aged for 6 months or more. The study was conducted following the guidelines of the ethical review committee of the Royal Medical services-King Hussein Hospital in Jordan. A structured questionnaire using Arabic language was administered to 2409 edentulous "Denture wearers" patients between August 2010 and July 2014. The clinical examination criteria was based on the (WHO Manual 1997).[12] It was based on the protocols of the oral health assessment proforma which was modified to satisfy the basic requirements of this research.

Two qualified prosthodontics with previous experience in epidemiological surveys were carried out the data collections, 3 and 6 months after initial training, using WHO criteria traditionally used in epidemiological surveys[12], after being calibrated by a "gold standard" examiner; a measurement that is widely accepted as being the best available to measure a construct. Data were analyzed by Kappa statistics, considering distinct data approach. The clinical training consisted of 4 periods of 4 hours each, and was conducted in the prosthetic clinic in a comfortable atmosphere. Each participant interviewed and examined 10 to 13 edentulous elderly "denture wearers". During this phase, each examiners discussed clinical diagnosis, study codes and criteria, recording and other errors in order to reach an acceptable level of agreement (Kappa>0.85).

A Microsoft Excel program was used to calculate the inter and intra examiner reliability by means of the Kappa statistics that has been recommended by the WHO[12]

and the British Association of Community Dentistry[13] for evaluation of agreement among examiners in this survey. The results showed a high means of inter and intra examiners reliability for both diagnosis thresholds when considering the entire geriatric "denture wearers".

In addition to that, the Functional Assessment of Dentures which includes 10-item criteria [14] describing clinical factors of denture quality was also used to include a range of clinical factors to produce an overall assessment of complete dentures. Both intra- and inter-examiner agreement for all 10 dichotomous scale criteria were all good or very good; the intra-examiner Kappa values were 0.86 to 0.95 and inter- examiner values were 0.85 to 0.91.

Information regarding the medical and dental histories was taken from the subjects themselves using an interview form. In order to standardize the examinations as far as possible, each one was conducted in the same systematic manner and the examiner stood in the same relative position to each subject. Subjects who were unable to understand the questions, or reply were excluded from the study. The interview included questions about the subjects' assessments of their own oral health and function, including denture satisfaction and their requirement of replacement, oral pain and chewing ability. Information was also obtained about social aspects of dental condition e.g; appearance, mouth smell and embarrassment caused by wearing a denture and if the patient demanded for new denture.

Dentures were inspected inside the mouth for poor retention, instability and unbalanced occlusion, and outside the mouth for soft or hard deposits and any obvious damage. Treatment needs for fabrication of a new dentures was evaluated. Oral mucosa was also examined for the presence of any obvious pathological change. Reflector illumination, dental mirror and a wooden spatula were used.

For statistical treatment of the data the Statistical Package for Social Science (SPSS), version 15.0 Software was used. The level of significance was set at 5%. Percentages for categorical variables were calculated. Statistical tests such as Chi-square and descriptive summary statics were employed to check the statistical association among variables.

Results

In total 2409 completely edentulous subjects were examined. The mean age of the patients was 69.5 years old (range 65 – 90), (53.1%) of them were male, (84.1%) came from the urban area. The normative need for dentures was professionally verified in 36.2% of the participants while patient demands for new dentures were in (25.7%) of them. Clinical assessment of denture needs was almost twice in rural geriatrics (69.5%) when compared with urban geriatrics (31.6%). The overall total needs varied from (29.1%) in Amman to (39.4%) in Al-karak (Fig.1).

The total sample and the number of edentulous subjects broken down by area, age, gender and social class is presented in Table I. These figures represent the base from which percentage and means in the following tables were calculated. There was a significant difference in characteristics between sex, age, location, presence of chronic diseases and social classes between 'Denture Wearer' in the three areas surveyed.

Table I: Geriatric "denture wearers" studied broken down by area, age, gender and social class.

	Amman (middle of Jordan) N (%)	Irbid (North of Jordan) N (%)	Al-Karak (south of Jordan) N (%)	Total N (%)	P-value*
Age:					
65-70	303 (33.9%)	252 (32.5%)	216(29.2%)	771 (32%)	0.006
71-79	387 (43.2%)	373(48.0%)	372(50.4%)	1132 (46.9%)	
80+	205 (22.9%)	151 (19.5%)	150 (20.3%)	506 (21%)	
Gender:					
Males	455 (50.9%)	414 (53.3%)	410(55.6%)	1279 (53.1)	0.00

Females	440 (49.1%)	362 (46.7%)	328(44.4%)	1130 (46.9%)	
Presence of chronic disease	368 (41.1%)	380 (48.9%)	394 (53.4%)	1142 (47.4%)	0.05
Social class:					
Urban	833(93.1%)	639 (82.4%)	565 (76.5%)	2026 (84.1%)	0.00
Rural	62 (6.9%)	137 (17.6%)	173 (23.5%)	383 (15.9%)	
All	895 (37.2%)	776 (32.2%)	738 (30.6%)	2409 (100%)	0.00

*P < 0.05

About (25.7%) of the subjects were not satisfied with their removable denture and wished adjustment or a new one. (39.1%) complained of oral pain due to wearing dentures and (13.6%) claimed to have difficulty during chewing. Also, (25%) of the subjects were mainly embarrassed by being wearing removable prostheses, while (13.5%) were embarrassed by their dentures dropping during social contact (Table II, Fig. 2).

The condition of the dentures worn by many of the surveyed subjects was unsatisfactory; (24.3%) showed gross occlusal errors, more than (32%) of the inspected dentures were not fitted well, about (36.2%) needs new dentures and in many cases the causative faults were due to the excessive age of the dentures, (33.6%) of which were over 10 years old (Table III, Fig.3).More than (37%) of the dentures showed depositions of plaque and /or calculus and about (63%) of the subjects do not clean their dentures daily as shown in (Table V).

The oral cavity of the surveyed subjects was carefully examined clinically to detect the presence of any pathology (Table IV). A high proportion (39.7%) had pathological lesions. Traumatic ulcers from denture wearing occurred in (33.1%) of the cases while denture hyperplasia of the so called fibroma type was present in (18.6%) of the cases. The commonest condition associated with denture wearing was denture stomatitis, which was present in (33.8%) of all cases, (16%) had concomitant angular cheilitis and (42.2%) wearing their dentures during the night. The total angular cheilitis was (28.4%), which was significantly related to the low vertical dimension P<0.05. Retained roots of teeth were clinically evident in (5.9%) of subjects.

Table II: Percentage (%) of the questionnaire findings for the geriatric "denture wearers" studied broken down by area, age, gender and social class.

	Area (%) Amman Irbid Al-Karak			Sex (%) Male Female		Age (%) 65-70 71-79 80+			Social class Urban Rural		Total (%)	*P-value
Denture over 10 years of age*	29.1	35.8	36.7	31.9	35.4	26.2	27.2	59.1	27.6	65.3	33.6	.000
Looseness of the dentures*	39.9	50.8	51.5	55.9	39.2	38.9	44.5	64.8	36.5	59.3	47	.000
Pain / discomfort	33.5	41	43.9	44.	334.5	41	43.3	28.9	41.6	25.8	39.1	.001
Chewing difficulty	14.1	13	13.6	12.5	14.9	13	11.4	19.6	16.4	20.6	13.6	.001
Embarrassment due to:	30.3	22	21.7	19.5	31.1	35	22.3	21.7	57	24	25	.007
	15.4	12.5	12.1	12.9	12.5	15.3	14	9.4	14.6	10.5	13.5	.000
	13.7	10.6	9.8	9.3	13.8	13.4	12.5	6.3	12.2	7.8	11.5	.005
Denture wearing at night*	29.6	48.1	51.4	37.4	47.7	45	30.7	63.6	39.6	56.1	42.2	.000
patient perceived treatment needs (demands)*	38.9	32.4	26.5	26.8	31.3	45.6	36.2	10.7	35.7	17.8	25.7	.0003

*P < 0.05

Table III: Percentage (%) of the clinical findings of complete dentures worn divided by area, age, gender and social class

	Area (%)			Sex (%)		Age (%)			Social class (%)		Total (%)	*P-value
	Amman	Irbid	AL-Karak	Male	Female	65-70	71-79	80+	Urban	Rural		
Poor retention	29.9	33.2	35.1	30.3	29.9	24.6	34.6	67	28.6	61.1	32.2	.000
Poor stability	25.6	39.7	43	30.4	35.4	30.4	35.1	72.3	32.4	61.6	35.5	.013
Un-even occlusion	13.1	29.4	32.5	21.5	27.4	12.3	27.4	35.6	18.5	54.8	24.3	..00
Damaged denture	22.6	31.2	34.1	24.9	33.5	22	20.3	58.5	21.7	66.8	28.9	.000
Patients' needed new denture	29.1	34.4	39.4	32.6	43.1	15.4	35.3	79	31.6	69.5	36.2	.000

Table IV: Percentage (%) of the oral pathology found in members of the sample Percentage (%) of the oral pathology found in members of the sample.

Oral pathology	Area (%)			Sex (%)		Age (%)			Social class		Total (%)	*P-value
	Amman	Irbid	Al-Karak	Male	Female	65-70	71-79	80+	Urban	Rural		
Ulceration associated with dentures	36.2	40.3	45.1	33.3	37.5	26.1	35.4	55.1	32.1	51.1	33.1	.000
Denture stomatitis	30.5	45.9	48	35.4	45.7	23.1	38.3	53.8	24.8	65.3	33.8	.000
Angular Cheilitis	23.6	30.3	32.2	25.2	32	12.3	32.8	43.1	23.2	55.9	28.4	.000
Hyperplasia (DIH)	14.4	20.5	21.7	15.8	21.8	13	10.5	29.4	15	37.8	18.6	.002
Retained root	4.5	6.8	6.6	5.5	6.4	7.3	5.9	3.4	5.5	8.1	5.9	,000
Others	7.9	9.7	10.3	8.8	9.6	7.6	5.6	21.9	5.4	5.5	9.2	..000
Total	24.4	44.6	54.2	35.8	44.1	29.1	46	69.2	17.7	35.5	39.7	.000

(P<0.05)

Table V: Denture cleanliness of 'Denture Wearers' subjects surveyed broken down by area, age, gender and social class in percent (%)

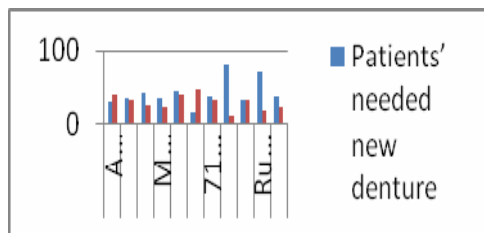|	Area (%)			Sex (%)		Age (%)			Social class (%)		Total (%)	*P-value
	Amman	Irbid	Al-Karak	Male	Female	65-70	71-79	80+	Urban	Rural		
Plaque / Calculus accumulation	27.7	42.1	49.7	38	35.9	25.9	25.9	78.9	32	63.4	37	.004
Dentue cleaning habits:- * Daily	42.5	33.5	33.9	31.3	43.9	49.3	42.4	6.9	39.3	25.6	37.2	.015
* Weekly – monthly	37.9	37.9	38.2	36.5	39.6	41.9	36.7	23.7	37.5	25.8	35.7	.004
* Rarely or never	20.1	30.4	32.4	21.7	33.4	13	15.9	74.1	23.1	48.6	27.2	.002

Fig. 1: 'Denture Wearers' needs and demands in different geriatric groups surveyed
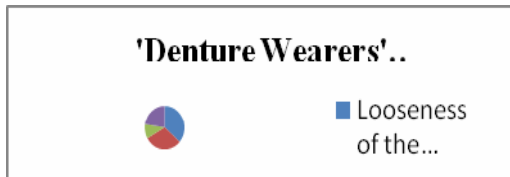

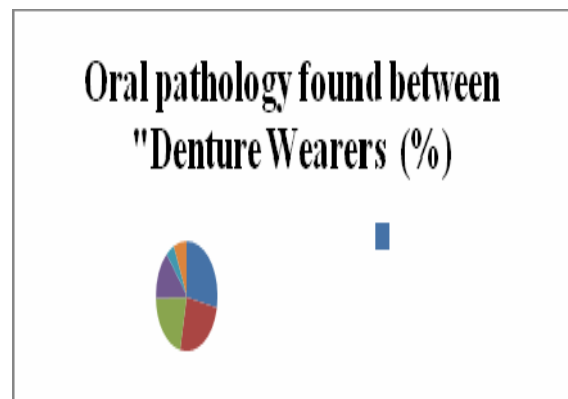
Fig. 2: 'Denture Wearers' satisfaction

Fig. 3: Oral pathology found between 'Denture Wearers' subjects surveyed

Discussion

The main aim of this paper was to draw out the major geographic and social variations in the oral condition of geriatric denture wearers in three different areas in Jordan, in order to obtain information about the oral health, treatment needs and demands of geriatric "Denture Wearers" in these communities since this information affects the estimation of treatment needs and demands is essential for the future planning of dental services. Moreover, this study based on self-evaluation of oral health which has also been considered one of the indicators of quality of life widely used in dentistry as it reflects the subjective experience of individuals about their functional, social and psychological well being.[15]

The studied population was Geriatric "denture wearers" from the main and largest provinces of the administrative areas in Jordan; Amman in the middle, Irbib in the north and Al-Karak in the south. Amman and Irbid consists also of more than half of Jordanian population.[16]

The study reveals significant differences (P<0.05) between those elderly subjects living in Al-Karak in the south from those living in Irbid in the north or Amman in the middle of Jordan in relation to denture status, treatment needs and demands which can be attributed to the Socio- demographic factors, life styles, and behaviors of the three samples surveyed in the three locations. This finding was consistent with the findings Allen (1999) who suggested that cultural and economic factors could have strong influence on oral health care outcomes.[17]

The denture status of this elderly population was generally poor and a large proportion had unsatisfactory dentures which were related to the patient's age. Professionally determined prosthetic treatment needs were (16%) higher than the patient's demands. A high percentage (39.9%) of the sample had oral pathology. These results were similar to that found by others.[18,19] Early diagnosis and treatment of dental disease are indicated because as the demaneating illness progresses communication and cooperation are lost and management becomes more difficult.[20]

The poor stability and retention of full dentures worn by elderly people has been widely reported, a finding confirmed in the present study. Significantly were more in rural and eldest groups confirming the finding of Smith and Sheiham (1979) and Emami etal (2013). [21,22] A number of reasons may be suggested for the high percentage of unsatisfactory retention and stability of the denture. Firstly, many of the dentures were old. Indeed, more than (33.6%) of the dentures had been worn for over than 10 years. According to Ettinger (1993) patients from rural groups were most likely to be wearing the same denture long period of time and may not replace or reline these dentures

in a timely manner because of financial constraint,[23] Murariu and Hanganu (2011) found that one of the reasons for that is their long time in use[24] because functional qualities such as stability, retention and occlusion become progressively unfavorable over time, and a specialized follow up is necessary for the maintenance of these dentures.[25] Secondly, about (29%) of the full dentures were damaged in many cases because their owners had difficulty in handling them due to poor general health condition.

Overall, the common impacts reported by denture wearers were chewing difficulty, physical pain, embarrassment due to wearing denture and dropping. There was no significant difference in the results between denture wearers studied.

In agree with the findings of Esan et al. (2004), Zainab, (2008) [26,27] more females demanded and needed for dentures compared to males. It is possible that there may be a difference in perception between genders regarding the use of dentures.

About (37%) of the examined patients reported cleaning their dentures at least once daily. A substantial proportion reported nocturnal denture wear, and this behaviour emerged as an independent risk factor for denture stomatitis in multivariate analysis, consistent with previous researches.[28]

It is understood that with getting old, dental and oral problems increase. Other factors could have an effect on oral health status such as chronic diseases, socio-economic factors which increase the neglect of personal and oral health and hygiene. Garrett et al (1996) and Shah (2001) explained that more than 50% of patients were more or less satisfied with their dentures which have been found by examining dentist in need for replacement. [29,30] In order to help patients, the dentist should communicate efficiently with them thus giving them the technical advice they need. [22,31]

In fact, this survey point out a big need for prosthodontic therapy among the 'Denture Wearer' subjects. However, detailed medical and dental history has to be taken to diagnose any systemic or oral disorder from which the patient might complain or suffer from since it may interfere with the patient ability to use his denture properly.

Further research on implant-supported prosthesis is indicated since this treatment could have a more positive effect on patients' well-being than conventional denture replacements.

Conclusion

Based on our findings, the following conclusions can be drawn:

• The results of this study reveal a number of adverse effects of complete dentures on oral health status, treatment needs and demands of the studied group of elderly population.

• It reinforce the notion that continuous provision of preventive and educational strategies coupled with accessible treatment services by the dentist and through public health measures, and good oral self care and regular professional recall for people who wear denture are essential.

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