Original Article

Oral Health-Related Quality of Life of Adult Orang Asli in Jelebu, Malaysia: A Cross-Sectional Study

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ABSTRACT

Aims: This study aimed at exploring the self-perception of *Orang Asli* (OA) from the Temuan tribe in Jelebu by using the Global Self-rated Oral Health (GSROH) and General Oral Health Assessment Index (GOHAI). **Materials and Methods:** It was a cross-sectional study involving a two-stage sampling to select the district and villages. A total of 325 participants were selected based on convenience sampling. **Results:** Almost half of the participants rated their oral health as poor or average. The mean GOHAI score was 52.96 ($\pm$7.749), ranging from 29 to 60. The GOHAI score was statistically significantly lower for female gender ($P = 0.025$), lower education level ($P = 0.001$), and elderly ($P = 0.001$). The GSROH score was also statistically significant with GOHAI score ($P = 0.001$). **Conclusions:** A limited number of studies were conducted in this area, particularly in the vulnerable population of OA. Our study found that half of the OA living in the fringe had a poor GOHAI score. It is, therefore, suggested that potential study and intervention programs concentrate on the low GOHAI score group; the male, lower educational context, and the elderly.

KEYWORDS: *GOHAI, GSROH, indigenous people, OHRQoL, Orang Asli*

INTRODUCTION

There are several indigenous groups in Malaysia and the group who resides in Peninsula Malaysia is referred to as *Orang Asli* (OA). They are categorized into three ethnic groups, namely Senoi, Proto-Malays, and Negrito. Each ethnic group has six different tribes.[1] A total of 178,197 OA in Peninsular Malaysia were distributed to different states, including 10,531 who resided in Negeri Sembilan. The OA in Jelebu belongs to the Proto-Malays group of the Temuan tribe.[2] They live in the periphery of the forests close to the Malay settlements.[3] Jelebu District is located not far from cities; about 35 km from Seremban City and 99 km from Kuala Lumpur, and those neighboring the Malay communities may have a modernistic influence on these OA communities compared with others. In 2010, Gill *et al.* discovered the similarity of consumerism trends among OA in Jelebu with the mainstream population and this could be influenced by world modernization.[4]

In 2010, the OA comprised 0.8% of the population in Peninsula Malaysia. It was found that 76.9% of OA were living below the poverty line.[5] Poverty among the OA often led to the neglect of their health.[6] Although the health of the OA improved over the years, their level of health status remained poor.[7,8] Rusaslina noted that the infant mortality rate of the OA was 51.7 out of 1,000

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live births, which was almost six times higher than the national infant mortality rate of 8.9 per 1,000 live births; the average life expectancy of OA at 53 years was lower than the average for Malaysians at 73 years.[9] It was found that about 67% of OA had dental caries and 66% had periodontitis.[10] Modernization had influenced their lifestyles, leading to the shift from infectious to chronic diseases such as obesity and cardiovascular-related problems.[11]

The conditions of oral health affect the functions of chewing food, aesthetics, and speech; cause pain and discomfort; and influence the psychosocial disposition. These oral health outcomes are collectively known as oral health-related quality of life (OHRQoL). These factors may have an influence on the OHRQoL of the OA. Therefore, the aim of the study was to determine the perception of the OA in Jelebu, Negeri Sembilan on their oral health status by using the GSROH and assessing their OHRQoL with its associated factors by using the GOHAI. The data on OHRQoL obtained from this study can provide the information to plan intervention strategies for improvement of the oral health of OA.

MATERIALS AND METHODS

STUDY DESIGN

This was a cross-sectional study on OHRQoL of the OA Temuan tribe residing in the Jelebu district settlement in Negeri Sembilan, Malaysia. The self-rated GSROH and GOHAI questionnaires were used. The study was conducted from January to December 2018.

SAMPLING METHOD

A two-stage random sampling method was used. The first sampling stage was to determine the district with the OA population in the Negeri Sembilan state of Malaysia. From nine districts in Negeri Sembilan, Jelebu district was randomly selected. According to the Department of Statistic Malaysia in 2010, Jelebu had the highest number of OA population compared with the other nine districts in Negeri Sembilan. The selected community was from the Proto-Malay group of OA. Proto-Malay constitutes 99.1% of the OA group in Negeri Sembilan. Their settlement was categorized as a fringe category, as it was located near Malay villages, which were accessed by a premix road; had basic amenities, clean water, and 24-hour electricity supply; and had a land development project and a sustainable economic source (JAKOA, 2010).[12]

After the villages were selected, the respondents were recruited by using the convenience sampling method as participation from the OA was voluntary. Among the barriers faced in this study were the accessibility, reticence factor of the respondents and their availability during the data collection. Convenience sampling approaches are nonrandom sampling methods, which may have limitations but are usually used in OA research.[13,14] The interview sessions were conducted at the community hall of each designated village.

The required sample size was calculated by using the formula by Krejcie and Morgan,[15] with the confidence level of 95%, the population proportion of 0.50, and the margin of error of 0.05. The formula used for these calculations was

$$n = \frac{X^2 NP(1-P)}{[ME^2(N-1)] + [X^2 P(1-P)]}$$
$$= \frac{1.96^2 \times 2195 \times 0.5 \times (1-0.5)}{(0.05^2 \times 2195 - 1) + [1.96^2 \times 0.5 \times (1-0.5)]}$$
$$= 327$$

where n = sample size

X^2 = critical value at 95% confidence interval
N = population size
P = sample proportion
ME = margin error.

The inclusion criteria included OA residents aged 18 years and older, who are able to communicate in the Malaysian national language, and who have been living in this settlement for at least one year.

DATA COLLECTION

The data on general health of the participants were obtained from the questionnaire and physical examination. A uniform protocol for the questionnaires, physical examination procedures, and the inclusion and exclusion criteria for each measurement was used to minimize error and bias. The interviewers were trained on the method of data collection, including physical examination, to avoid variations in techniques and ensure uniformity in the measurement.

The questionnaire consisted of three parts. The first part was based on sociodemographic characteristics of sex, age, and educational status. The second part was based on the presence of noncommunicable diseases (hypertension and diabetes mellitus). Diabetes mellitus and hypertension were defined as self-reported, of being told to have diabetes mellitus or hypertension by a doctor or an assistant medical officer (AMO) as adopted by the Malaysia National Health and Morbidity Study 2015.[16]

The physical examination of height and weight was performed in relation to the assessment of Body Mass Index (BMI). Height was measured to the nearest 0.1 cm by using a portable and rigid measuring tape.

The calibrated weight scale was used to measure the weight of the subjects. The weight scale was calibrated for each participant by laying it flat on the ground and ensuring the indicator was pointed to 0. When recording the weight, each participant was required to remove all items on the body, such as watches, wallets, shoes, and others; as well as the participant had to stand upright on the scale with the face looking forward. This was to ensure that there would be minimal random errors made. The BMI was determined by weight in kg divided by the square of height in meters. It was dichotomized into <25 and with ≥25 as the cutoff point for overweight.

For the third part, the GSROH approach was used by asking the participants "How would you rate your own oral health?" They were required to respond as excellent, very good, good, average, or poor. This was followed with the assessment of OHRQoL by using the GOHAI questionnaire that was validated in the Malaysian national language.[17]

DATA ANALYSIS

The GOHAI questionnaire consists of 12 items, with item number three, five, and seven worded in a positive manner. The response option for the questionnaire was based on the experiences of the participants for the past three months. A 5-point Likert scale of 1 (always), 2 (often), 3 (sometimes), 4 (seldom), and 5 (never) was used. The responses for the items with positive statements were reversed during data processing. The score for each participant ranged from 12 to 60. The higher the score, the better was the OHRQoL. Atchison and Dolan[18] categorized the scores as good (score 57–60), fair (score 51–55), or poor (score 50 or less). In analyzing the GOHAI scores, responses of "always" and "often" for the items with negative statements and the responses of "never" and "seldom" for the items with positive statements were combined.

The responses were entered and analyzed by using IBM SPSS Statistics for Windows, Version 20.0. The sociodemographic profile of respondents, GSROH status, and the GOHAI items were presented as frequencies and percentages. For inferential analysis, the data were tested for normality by using the Shapiro-Wilks test. It was found that the GOHAI score was not normally distributed. Therefore, the Mann-Whitney test was used for two categorical variables and the Kruskal–Wallis test was used for more than two categorical variables to determine the level of significance of the variables, which was set at $p < 0.05$.

ETHICAL CONSIDERATION

Ethical approval was obtained from the Medical Ethics Committee of the Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM/FPg-MEC/2016/No (17) to conduct the study. Permission was also obtained from the State Government of Negeri Sembilan, Malaysia Department of Orang Asli Development (JAKOA), and the District Health Office of Jelebu. Written informed consent was obtained from the participants before the interview.

RESULTS

SOCIODEMOGRAPHIC CHARACTERISTICS

A total of 325 OA from the Temuan tribe participated in this study. Table 1 shows the sociodemographic and health profile of the subjects. The mean age was 39.94 (±13.196) and it ranged from 18 to 83 years old. Most of the participants were in the age group of 35 to 44 years old. The elderly, considered as those 60 years old or older, formed 7.7% of the participants. Most of the participants were female (71.1%). In terms of formal education, 32% never attended school and only 4.0% pursued to tertiary

Table 1: Sociodemographic and health profile of the participants

Variables	Frequency	Percentage
Age category, years (*n* = 325)		
18–19	9	2.8
20–24	33	10.2
25–29	41	12.6
30–34	48	14.8
35–44	72	22.2
45–54	71	21.8
55–64	39	12.0
65–74	10	3.1
75+	2	0.6
Age category, years (*n* = 325)		
18–59	300	92.3
≥60	25	7.7
Gender (*n* = 325)		
Male	94	28.9
Female	231	71.1
Level of education (*n* = 325)		
No formal education	104	32.0
Primary education	127	39.1
Secondary education	81	24.9
Tertiary education	13	4.0
Hypertension (*n* = 325)		
Yes	48	14.8
No	277	85.2
Diabetes mellitus (*n* = 325)		
Yes	14	4.3
No	311	95.7
BMI category, m²/kg (*n* = 325)		
<25.00	133	40.9
≥25.00	192	59.1

BMI = body mass index

level of education. From the perspective of health, 14.8% of the participants presented with hypertension and 4.3% with diabetes mellitus. Almost two-thirds of the participants had a BMI more than 25m²/kg (59.1%).

GSROH STATUS

Figure 1 shows the perception of the participants on their oral health. Almost half of the participants rated their oral health as either poor or average. However, about one-third of the participants (35.4%) indicated that their oral health was good.

OHRQoL

The mean GOHAI score was 52.96 (±7.749), and it ranged from 29 to 60. Figure 2 shows the GOHAI score category of the participants. It was found that most of the participants (46.2%) had GOHAI scores of 57 or more and were considered to have good OHRQoL. This was followed by 30.2% of the participants who perceived their oral health as poor and 23.7% as fair.

The items in the GOHAI questionnaire were rearranged according to the three functional dimensions: psychosocial, pain, and discomfort. The result was presented according to the percentage for each response category of the GOHAI questionnaire item, as observed in Table 2. It was found
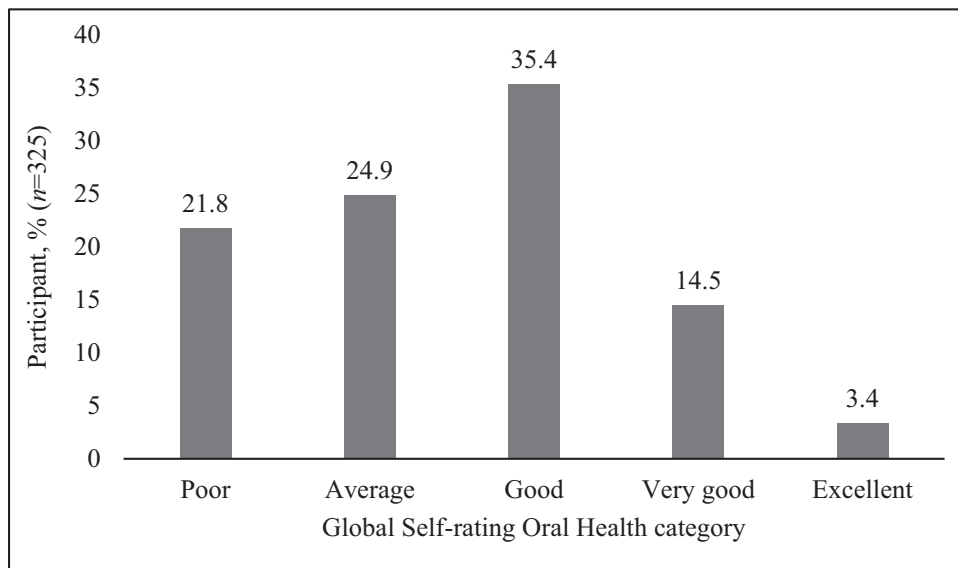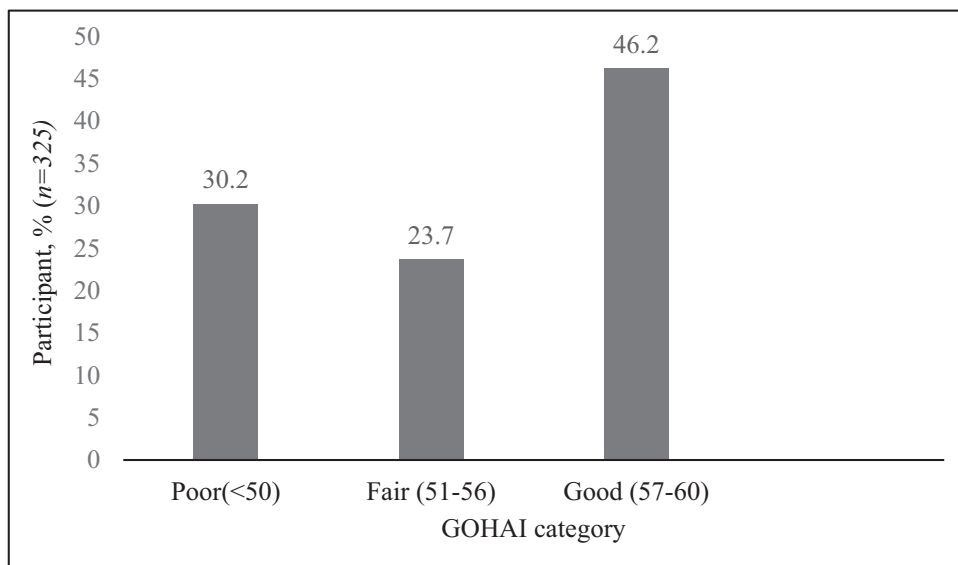

Figure 1: GSROH among participants

Figure 2: GOHAI scores of the participants according to category

Table 2: Total GOHAI score of the study population

GOHAI item	GOHAI response category (n = 325)				
	Never	Seldom	Sometimes	Often	Always
Physical function					
Limit the kinds of food consumed	184 (56.6)	73 (22.5)	26 (8.0)	35 (10.8)	7 (2.2)
Trouble biting or chewing	183 (56.3)	73 (22.5)	28 (8.6)	33 (10.2)	8 (2.5)
Able to swallow comfortably	13 (4.0)	12 (3.7)	21 (6.5)	71 (21.8)	208 (64.0)
Unable to speak clearly	229 (70.5)	62 (19.1)	20 (6.2)	11 (3.4)	3 (0.9)
Psychosocial					
Limit contact with people	249 (76.6)	48 (14.8)	20 (6.2)	7 (2.2)	1 (0.3)
Pleased with appearance of teeth	13 (4.0)	19 (5.8)	36 (11.1)	62 (19.1)	195 (60.0)
Worried about teeth, gum, or dentures	211 (64.9)	43 (13.2)	44 (13.5)	18 (5.5)	9 (2.8)
Self-conscious about teeth, gums, or dentures	252 (77.5)	47 (14.5)	21 (6.5)	5 (1.5)	0
Uncomfortable eating in front of others	242 (74.5)	48 (14.8)	26 (8.0)	8 (2.5)	1 (0.3)
Pain/ discomfort					
Able to eat without discomfort	14 (4.3)	25 (7.7)	29 (8.9)	64 (19.7)	193 (59.4)
Use medication to relieve pain	254 (78.2)	34 (10.5)	32 (9.8)	5 (1.5)	0
Sensitive to hot, cold, or sweet food	200 (61.5)	30 (9.2)	77 (23.7)	8 (2.5)	10 (3.1)

that the functional dimensions to limit the kind of foods consumed (13.0%) and trouble biting or chewing (12.7%) were recorded as the participants' greatest concern. The other concern was in the pain and discomfort dimension, whereby 12.0% of the participants were not able to eat comfortably. It was also revealed that almost 9.8% of the participants were affected psychosocially in relation to the appearance of teeth.

The GOHAI scores based on median (IQR) were statistically significant for gender ($p = 0.025$), educational level ($p = 0.001$), and age group ($p = 0.001$), as shown in Table 3. Female participants had a higher median GOHAI score than their male counterparts. Participants with no formal education had a significantly lower GOHAI score than participants with at least primary education. When the age groups were further dichotomized into younger than 60 years old and 60 years old and older (elderly), it was found that the elderly had a significantly lower GOHAI score than those in the younger age group ($p = 0.001$). There was no statistically significant association between hypertension and diabetes mellitus and BMI with a median GOHAI score.

The perception of the oral health status was then matched with the GOHAI score, as observed in Table 4. It was found that the participants with a lower perception of their oral health status had a significantly less GOHAI score than the participants with a better perception of their oral health ($p<0.001$).

Discussion

It was found that about 50% of the participants intuitively rated their oral health as either good, very good, or excellent, as determined by the GSROH. Lawal[19] found that those with or without oral conditions

in the studied population could be determined by using GSROH. It was also found that GSROH was positively associated with clinical assessment of oral health.[20] The use of GSROH is considered appropriate in situations where the clinical examinations are not practical and feasible due to logistics or the condition of the clinical field setting as well as resource constraints.[19,21] This study adopted the GSROH, as it was conducted from house-to-house and in an unconducive environment that would make clinical examination not feasible. Although no clinical examination was conducted, the findings of the GSROH corresponded with the GOHAI score, that is, the participants with a low perception of their oral health also have low OHRQoL. This was consistent with findings by Meija *et al.*[22] on the positive association between GSROH and the perceived need for oral health care.

The mean GOHAI score for the OA participants was 52.96 (±7.749). This appeared to be lower than the semi-urban villagers in the same state, whose mean GOHAI score was 53.66 (±7.4).[23] The GOHAI score for those younger than 60 years old was 53.4(±7.580), and they were considered to have good OHRQoL. There were 25 (7.7%) participants aged 60 years old and older who were categorized as elderly. The mean GOHAI score for the OA elderly participants was 48.08 (±8.246), as compared with the elderly Malaysians who recorded a higher mean GOHAI score of 51.1 (±6.7) by using the five-point rating scale similar to the one used in this study. These scores indicated that the Malaysian elderly population perceived their OHRQoL to be fair, in contrast to the OA elderly participants who felt that their OHRQoL was poor. The elderly had a significantly lower GOHAI score than the participants who were younger than the age of 60 years

($p = 0.001$). This situation arose, because the elderly often have very few teeth left.[24]

Studies on the elderly using GOHAI indicated that the mean GOHAI score of the OA was higher than Mexico (46.8 ±6.2), as reported by Montes-Cruz *et al.*[25], and China (48.9 ±7.2), as reported by Wong *et al.*[26]; however, it was lower than the study in Brazil (53.9), as reported by de Andrade *et al.*[27], and Germany (51.9 ± 7.6), as reported by Pistorius *et al.*[28] This indicated that people with different cultural backgrounds may respond differently to the statements in the GOHAI questionnaire.[29]

There is a dearth of articles on the oral health of OA but lately it appears that there is a renewed interest on this subject matter based on published articles, particularly on OA school children.[23,30,31] Nevertheless, there is limited information on the oral health of OA adults. The significance of this study is that it contributes to the body of knowledge on OA, as a marginalized minority population in this country, so that scientific evidence on their plight is brought to the attention of policymakers. The OA have access to all government clinics. The government has also made a concerted effort to reach out to these disadvantaged groups through house-to-house visits and oral screening activities as well as activities of mobile dental clinics.[32] In spite of these efforts, only 26.3% utilized these services.[33] The level of utilization by this group is influenced by the lack of knowledge and interest in oral health.[32] This is believed to be associated with their culture on health. This situation is compounded by limited essential facilities such as electricity, roads, and similar constraints.[32] It was also highlighted that they preferred to indulge in self-treatment or consulted the designated traditional medicine man in their community.[33]

Table 3: GOHAI score and associated factors

Variables	n	Mean (SD)	Median (IQR)	P-value
Age category, years				
18–59	300	53.36 (7.580)	56 (11)	0.001[a]*
≥60	25	48.08 (8.246)	48 (11)	
Gender				
Male	94	51.59 (7.932)	53 (12)	0.025 [a]*
Female	231	53.52 (7.621)	57 (10)	
Level of education				
No formal education	104	50.62 (8.532)	53 (13)	0.001[b]*
Primary education	127	53.38 (7.569)	57 (11)	
Secondary education	81	54.74 (6.695)	57 (7)	
Tertiary education	13	56.46 (3.479)	58 (5)	
Hypertension				
Yes	48	50.79 (8.889)	52.5 (14)	0.065[a]
No	277	53.33 (7.489)	56 (11)	
Diabetes mellitus				
Yes	14	50.93 (9.294)	53.5 (13)	0.382
No	311	53.05 (7.678)	56 (12)	
BMI category, m²/kg (N = 325)				
<25.00	133	52.07 (8.388)	56 (14)	0.203
≥25.00	192	53.57 (7.233)	56 (10)	

BMI = body mass index, SD = standard deviation, IQR = inter-quartile range

[a]Mann–Whitney *U* test

[b]Kruskall–Wallis test

*Statistically significant at $P < 0.05$

Table 4: The association of GSROH and GOHAI score

GSROH	n (%)	Mean (SD)	Median (IQR)	p-value[a]
Poor	71 (21.8)	44.39 (7.875)	44 (11)	<0.001*
Fair	81 (24.9)	51.43 (7.181)	53 (11)	
Good	115 (35.4)	56.50 (4.210)	58 (5)	
Very good	47 (14.5)	58.32 (2.486)	60 (2)	
Excellent	11 (3.4)	59.55 (1.508)	60 (0)	

SD = Standard deviation, IQR = Inter-quartile range

[a]Kruskall–Wallis test

*Statistically significant at $P < 0.05$

This behavior is different from the other predominant ethnic groups of Malay, Chinese, and Indian. The OA is a marginalized community that lives in the interior rural areas that are far away from modernization.[2] These factors may have influenced their health-seeking behavior. Their overall health, particularly that of those in the periphery, is poorer than that of the general population. However, in tandem with the progress of the country, they are at all stages of development.[7] With progress, comes a change in lifestyle. There are indications of a gradual shift from communicable diseases to noncommunicable diseases among the OA that is consistent with the global disease trend.[3]

CONCLUSION

This study found that almost half of the OA participants have an average to poor perception of oral health and OHRQoL. It also found that the OHRQoL of OA in Jelebu was influenced by gender, age, and educational status. Since poor GOHAI scores were related to problems in chewing, oral pain and discomfort, and low psychosocial status, it is suggested that a future study be conducted in this area, including an oral examination in the community. In addition to that, the continuous educational and awareness programs that are conducted among this population that experiences poor oral health conditions may lead to a limitation of food choice and malnutrition. Therefore, it is recommended that further development of appropriate oral health programs should focus on the needs of affected populations, particularly males, those of a low educational status, and the elderly.

CONFLICTS OF INTEREST

Not applicable.

AUTHORS' CONTRIBUTIONS

Not applicable.

ETHICAL POLICY AND INSTITUTIONAL REVIEW BOARD STATEMENT

Not applicable.

PATIENT DECLARATION OF CONSENT

Not applicable.

DATA AVAILABILITY STATEMENT

Not applicable.

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