Health-related quality of life and its predicting factors among male oral cancer survivors in Sri Lanka: A cross sectional study

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ABSTRACT

Introduction: Health-related quality of life (QoL) and its predicting factors for oral cancer survivors are varied and little evidence is available in Sri Lanka. This descriptive cross-sectional study aimed to assess the QoL and its predicting factors of male oral cancer survivors.

Methods: The study was conducted at Apeksha Hospital (National Cancer Institute, Sri Lanka) from June to December 2018 for a period of six months. QoL of 295 oral cancer survivors was assessed using the WHOQoL-BREF questionnaire. The range of QoL score is from 0 to 100 and higher the score, higher the level of QoL Socio-demographic and disease-specific characteristics were considered as predicting factors for QoL and Multiple linear regression was performed to determine the predicting factors. The significant level was kept as $p<0.05$.

Results: The mean score of QoL was averaged among all domains of WHOQoL-BREF questionnaire, which was depicted as 51.9±15, 52.3±19, 49.5±22 and 59.2±16 in Physical, Psychological, Social Relationship and Environment domains respectively. The number of years from diagnosis, metastasis, cancer stage and cancer site were the predictors of the physical health domain while employment status, metastasis, cancer stage and duration of betel chewing for the psychological domain ($p<0.05$). Age, education status, monthly income, metastasis, and duration of alcohol consumption were identified as the significant predictors of social relationships while employment, monthly income, metastasis, and duration of betel chewing were predictors of the environment domain ($p<0.05$).

Conclusions: The study revealed that QoL of all domains were around average, but each QoL domain has different predicting factors. Therefore, consideration of these predicting factors are immensely helpful to enhance the QoL of these survivors.

Keywords: *Cancer survivors, health-related quality of life, oral cancer.*

Introduction

Cancer is considered the leading cause of death in the world (1). Oral cancer stands in 6th place as the most prevalent cancer in the world, however, the prevalence of oral cancer-related morbidity and mortality is comparatively higher in developing countries such as South-East Asia in comparison to other parts of the world (2, 3). Furthermore, oral cancer is the most prevalent cancer among male adults in Sri Lanka due to unhealthy behaviours such as betel chewing, smoking and alcohol consumption (4-7). Living with oral cancer directly affects the Health-related Quality of Life (QoL) of both individuals and their families (8-10).

The World Health Organization (WHO) defines the QoL as the individual's perception of the context of the culture and value systems in their life (11). The main concepts of QoL include: the individual's level of physical health, psychological state, independence, social relationships, personal beliefs and mutual relationship with the environment (11, 12). Therefore, the measurement of QoL is a contemporary approach to estimate an individual's health status (13) and is easy to identify the individuals who are at high risk for poor survival, initiate early treatment plans and estimate the prognosis, particularly in cancer survivors (14, 15).

The QoL is an important outcome that interacts between general health conditions, and psychosocial and contextual factors of individuals (16). Moreover, socioeconomic status (17), disease-specific characteristics, not adhering to general health habits like smoking, betel chewing and alcohol consumption are commonly recognised predominant predictors of QoL for oral cancer (18-19). The QoL domains in oral cancer survivors deteriorate over time from the date of their diagnosis (20). Therefore, focused attention towards all of these associated factors can alleviate the impact caused by the disease and improve the QoL among oral cancer survivors (16). Cancer increases the fear of death and reduces patients' QoL (21). Therefore, improving and maintaining the QoL is a major milestone in cancer care that create physically, socially and emotionally fit individual (11, 22). However, there is a paucity of evidence to determine the level of QoL and its predicting factors ofhealth-related QoL among male oral cancer survivors in Sri Lanka and these predicting factors may be helpful to enhance the QoL. Therefore, this study aimed to assess the QoL and its predicting factors of male oral cancer survivors in Sri Lanka.

Methods

Study Setting / Population

This descriptive cross-sectional study was conducted at Apeksha Hospital (National Cancer Institute, Sri Lanka) from June to December 2018 for a period of six months. It is the main hospital for cancer treatments in Sri Lanka. Approximately 1000 patients are registered per month for cancer treatment while about 10% - 20% of patients among them are diagnosed with oral cancer (23). Brinkman and Wong (24) revealed that the peak age of oral cancer prevalence is between 50 - 59 years, followed by 40 - 49 years. Therefore, for the present study, the sample selected was aged between 35 to 65 years.

Sampling and Sampling Size

The consecutive sampling was used to collect data from male oral cancer survivors aged between 35-65 yrs who were diagnosed more than three months before the data collection. The sample size was calculated by using the sample size calculation formula for the prevalence study [z^2 p (1-p)/ d^2] and the prevalence of oral cancer was taken as 20% (23). Furthermore, by considering the 20% of attrition rate, 295 oral cancer-diagnosed male survivors were recruited and written informed consent was obtained from each of them to participate in the study.

Data Collection

Data were collected in at the Apeksha Hospital questionnaire consisted of two sections including demographic information along with disease-specific information and QoL questionnaire. The level of QoL was assessed via a pre-tested WHOQoL-BREF questionnaire, which includes 26 questions under the four domains of physical health, psychological, social relationship and environment (25). The domains score for the WHOQoL-BREF is calculated by taking the mean of all items included in each domain and multiplying by a factor of four. These scores are then transformed to a 0 - 100 scale.

WHO granted permission for using the WHOQoL-BREF questionnaire and Ethical clearance for the study was obtained from the Ethical Review Committee, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka.

Data Analysis

Data were analysed by statistical package for social sciences (*SPSS*™) software version 25. Descriptive data were presented by frequency and percentage in tables. Categorical data were analysed using chi-square tests. Multiple Linear Regression (MLR) model was performed to determine the predicted factors for QoL among oral cancer survivors without gross violations of basic assumptions. Furthermore, variables that are highly correlated and measure the same construct were not considered when performing MLR, and the categorical variable is converted to dummy variables before performing MLR. The significant level was kept as $p < 0.05$.

Results

Basic demographic characteristics of the study sample

Two hundred and ninety-five male oral cancer diagnosed survivors (mean age 56.1±7.5 years) participated in the study. More than 85 % were married. The majority of the participants (64.3%) were educated up to the General Certificate of Education (G.C.E.) Ordinary Level and above. The majority of the participants were employed (59.3%), and around 47.0% earned more than LKR 20,000/- per month (Table 1).

Disease-specific characteristics of the study sample

Approximately 50% of the participants with oral cancers in the study were diagnosed less than one year ago, and nearly 38% of the participants had undergone two or more two treatment modalities (Chemotherapy, Radiotherapy and Surgery). The majority of oral cancers studied were located in the oral cavity (71.5%) followed by the pharynx (18.1%). About 31% of them had metastases to secondary sites while nearly 50% were in cancer stages of T3 and T4 (Table 2).

Table 1: Basic characteristics of study participants

Variables	Categories	Frequency (%)
Age (in years)	35 - 45	37 (12.5)
	46 - 55	81 (27.5)
	56 - 65	177 (60.0)
Civil status	Married	252 (85.4)
	Unmarried	43 (14.6)
Level of education	Primary	94 (31.9)
	Secondary	190 (64.4)
	Tertiary	11 (3.7)
Employment	Unemployed	23 (7.8)
	Self-employed	99 (33.6)
	Employed	173 (58.6)
Monthly income (LKR)	None	26 (8.8)
	≤ 20000	133 (45.1)
	> 20000	136 (46.1)

Health habits of the participants

Betel chewing, smoking and alcohol consumption were observed in 77.0%, 72.0% and 60.0% of participants respectively. Out of participants who had been chewing betel, around 87% had been doing it for more than ten years, while nearly one-third of them engage in the habit more than ten times per day. Similarly, out of the patients who had the habit of smoking, 83.6% had been doing it for more than ten years, while around 36% smoked more than ten cigars per day. Nearly 70% had been consuming alcohol on regular basis for more than ten years (Table 3).

QoL among male adults with oral cancer

When mean scores of the four domains of QoL were considered, the environment domain revealed the highest mean score (59.2±16.6) while the social relationship domain had the lowest (49.5±22.5) score (Table 4). Approximately half of the study sample (n=146) revealed that they had neither poor nor good QoL status.

Table 2: Disease-specific characteristics of study participants

Variables	Categories	Frequency (%)
Cancer site	Lip	30 (10.2)
	Oral cavity	211 (71.5)
	Pharynx	54 (18.3)
Duration since diagnosis	3 - 12 months	148 (50.2)
	1 - 3 years	111 (37.6)
	> 3 years	36 (18.3)
Cancer stage	T1	44 (14.9)
	T2	113 (38.3)
	T3 or T4	138 (46.8)
Metastases	No metastases	203 (68.8)
	Metastases	92 (31.2)
Comorbidities		
Diabetes mellites		63 (21.4)
Arthritis		7 (2.3)
*CHD		27 (9.2)
*CKD		4 (1.4)

Table 3: Health habits of the participants

Variables	Categories	Frequency (%)
Betel chewing		227 (77.0)
Smoking		211 (71.5)
Alcohol consumption		175 (59.3)
Betel chewing duration	Less than 10 yrs	30 (13.3)
(n=227)	More than 10 yrs	197 (86.7)
Smoking duration	Less than 10 yrs	35 (16.4)
(n=211)	More than 10 yrs	176 (83.6)
Alcohol consumption	Less than 10 yrs	53 (30.0)
duration (n=175)	More than 10 yrs	122 (70.0)

Table 4: Mean scores of QoL domains

Domain	Mean ± SD
Physical health	51.8 ± 15.6
Psychological	52.3 ± 19.8
Social relationship	49.5 ± 22.5
Environment	59.2 ± 16.6

Predicting factors of QoL among male oral cancer survivors

Univariate analysis was performed to identify potential significant predictors of the dependent variables (p<0.25) and all prerequisite assumptions are considered before formulating the MLR model. The factors that had significant associations based on univariate analysis were considered as predicted variables of the model and they were age, gender, civil status, educational status, monthly income, duration from diagnosis, cancer site, metastasis, cancer stage, duration of alcohol consumption, duration of smoking and number of years of betel chewing. Predicting factors are separately considered in physical, psychological, social relationships and environmental domains.

MLR revealed that the number of years from diagnosis (p=0.043), metastasis (p=0.021), cancer stage (p=0.048) and cancer site (p=0.038) were the statistically significant predictors of the physical domain, explaining 45.6% of the variance (Table 5).

Factors significant in the psychological domain were employment status (p=0.028), metastasis (p=0.001), and duration of betel chewing (p=0.045). The model was explained by 65.0% of the variance of the predator variables (Table 5). Furthermore, age (p=0.008), education status (p=0.041), monthly income level (p=0.047), metastasis (p=0.006) and duration of alcohol consumption (p=0.037) were observed as significant predictors of the social relationship domain which can be explained by 93% of the variance. Moreover, factors associated with the environmental domain were employment (p=0.045), monthly income level (p=0.006), metastasis (p=0.016) and duration of betel chewing (p=0.044) and the model can be represented 63% of the variance (p<0.05) (Table 5). Other factors that have not been followed in the study, unexplained or accidental factors may have contributed to the remainder of the variance in the physical health, psychological social relationship and environmental domains.

Table 5: Predicting factors for QoL domains

	Variable	*p*	R	Adjusted R^2	F
Physical health domain	Number of years from diagnosis	0.043	0.32	0.456	1.78
	Metastasis	0.021			
	Cancer stage	0.048			
	Cancer site	0.038			
Psychological domain	Employment status	0.028	0.35	0.650	2.16
	Metastasis	0.001			
	Cancer stage	0.050			
	Duration of betel chewing	0.045			
Social relationship domain	Age	0.008	0.39	0.930	2.69
	Education status	0.041			
	Monthly income	0.047			
	Metastasis	0.006			
	Duration of alcohol consumption	0.037			
Environment domain	Employment status	0.045	0.34	0.630	2.11
	Monthly income	0.006			
	Metastasis	0.016			
	Duration of betel chewing	0.044			

(Multiple regression analysis)

Discussion

The findings of the present study show that mean values of physical, psychological, social relationship and environment domains were average (all are nearly 50). Overall, QoL scale was neither poor nor good, which was compatible with each domain mean score. However, the mean value of the environment domain was comparatively higher while that of the social relationship domain was the lowest in the current study.

In general, QoL in oral cancer survivors was considerably at a lower level, in comparison to the general population (10, 26-27) and a similar trend has been observed over time (10). Oral cancer survivors in Thailand had that the mean scores of all domains of WHOQoL - BREF at an average level are that was compatible with the present study findings (28). Furthermore, the environmental domain had the highest mean value while the physical domain had the lowest among Thai elders (28). In addition, a study conducted in Spain revealed that the value for the physical domain remained at a lower level even after six months of follow-up treatment, compared to the general population (10). However, there was no significant difference in the psychological domain in both groups as oral cancer survivors have been mentally adapted to their condition over time (10). A study in Brazil reported that lower QoL scores in the social relationship followed by environment domains were opposed to the scores of present QOL domains (12). The QoL generally declined when people are getting older, therefore all QoL domains of older cancer survivors in some European countries such as; Norway, Switzerland, Sweden, Denmark, Germany, and the Czech Republic were below the QoL scores of the present study as age of present oral cancer survivors is limited to below 65 years (29).

Recent evidence reveals that socio-demographic information has contributed to predicting factors for QoL among oral cancer survivors (26, 28, 30-32). The present study also revealed that age, employment status, educational status and monthly income were the significant predictors of QoL. Oral cancer survivors in Thailand reported that educational level was a significant predictor for QoL (28) while both age and educational status were significant predictors for QoL among Iranian oral cancer survivors (26). Furthermore, a study conducted in the UK revealed that age, gender, level of education and marital status were considerable predictors of QoL among oral cancer survivors (30). Solomon *et al.,* (17) shown that employment status (unskilled), monthly income and living area were predicting factors of QoL in India. Moreover, Dantas *et al.*, that a low level of education and lower economic status have negatively affected the survival of patients with oral cancer in Brazil (31) and similar socio-demographic factors such as age, gender and income level have been reported in the USA and Turkey (32-33). Therefore, socio-demographic statuses such as older age, lower level of education, male gender, lower income and marital status (divorce or separate) indicate comparatively poor QoL among oral cancer survivors (26, 28, 30-32).

Furthermore, the present study revealed that disease-specific characteristics such as the number of years from diagnosis, metastases, cancer stage, cancer site and poor adhering to were predominant predictors for QoL while betel chewing and alcohol consumption were considered as health habits for QoL. The end-stage of the tumour belongs to T4 and Kondo *et al.,* (34) stated that T4 stage of oral cancer was identified as a significant predictor for QoL which was similar to the finding of the present study results. Similarly, the history of recurrence was one of the leading predicting factors for QoL among Iranian oral cancer survivors (26). Therefore, increasing the number of years of living with oral cancer decreases the QoL of individuals (26). Solomon *et al*., revealed that cancer location (pharynx and oral cavity) was a significant predictor that was compatible with our findings particularly in physical health domain (17) and such location involves chewing (35), swallowing, speech and production of saliva (36) that affect QoL for oral cancer survivors. Therefore, considering QoL and its predicting factors in the current study, it is essential to establish a system to counsel oral cancer survivors providing them with knowledge and practical advice about cancer care (37, 38), commencing specific palliative care programmes (25) and introduce supportive care service (20) for oral cancer survivors to enhance the QoL. Though the observed QoL values in the current study are comparatively better than those of many other

studies done elsewhere, a proper mechanism to address the issues related would be an exercise worthwhile.

The present study has some limitations. The cross-sectional design of the study only allowed for the descriptive association of QoL and its associated factors, but a causal conclusion could not be drawn. Therefore, a longitudinal study would be more effective in that respect. In addition to the aforementioned predicting factors, side effects of cancer treatments (17, 37, 38), presence of dysphagia and hoarseness (39), tissue reconstruction undergone (34), tooth brushing and tooth loss (40) determine the QoL which was not considered in the present study among oral cancer survivors. Furthermore, our study was concentrated around the main cancer hospital in Sri Lanka where we expect to have good quality care for the survivors. Therefore, we recommend that a multi-centre study involving many units island-wide should be conducted in the future to get an overall picture.

Conclusions

This study offers important information for all healthcare professionals. The overall QoL for male oral cancer survivors was found to be at an average level. Furthermore, age, monthly income, educational status, and employment status were the predominant socio-demographic predictors while the number of years from diagnosis, metastasis, cancer stage, cancer site, duration of betel chewing and alcohol consumption were significant disease-specific predictors for QoL among male oral cancer survivors. Therefore, consideration of these predicting factors would be facilitated to improve QoL among male oral cancer survivors.

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