Factors associated with oral health-related quality of life in alcoholic patients: a cross-sectional study[1]

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Received: April 24, 2023 **Accepted: November 20, 2024**

Abstract:

Introduction: although the factors associated with the general quality of life in alcoholic patients are well established, there are no studies to date that evaluate the factors associated with the quality of life associated with the oral health of these individuals. Thus, the objective of this article was to evaluate the impact of sociodemographic factors, oral hygiene, alcohol and cigarette consumption as well as the decayed, missing and filled teeth index (DMFT) on the oral health-related quality of life (OHRQoL) of alcoholic patients. Methods: cross-sectional study with a sample of 400 adult men. The DMFT index was applied by a calibrated examiner

[1] This article comes from a dissertation: Master's Dissertation from the Postgraduate Programme in Dentistry, https://acervodigital.ufpr.br/handle/1884/86308. Title: Impact of oral health on the quality of life of alcoholics. Institution: Federal University of Paraná. YEAR: 2017. ADVISER: Maria Ângela Naval Machado.

(kappa=0.85 inter-examiner, kappa=0.9 intra-examiner). Self-perception of oral health was measured using the short version of the Oral Health Impact Profile (OHIP-14). Descriptive analysis and univariate and multivariate Poisson regression with robust variance were performed. Values of p<0.05 indicated statistical significance. Results: no statistically significant associations were detected between sociodemographic factors and OHRQoL. However, oral hygiene represented by the use of toothpaste (p=0.016), self-perception of metallic taste (p=0.011) and self-perception of tooth mobility (p=0.019); alcohol consumption (p=0.009) and DMFT index (p=0.034) were associated with a negative impact on OHRQoL. Discussion: the study has limitations involving the possible risk of memory bias. However, the study brings to light the complexity of quality of life and oral health in a marginalized population. Conclusion: hygiene habits, higher alcohol consumption and DMFT index are factors that lead to low OHRQoL.
Keywords: Oral Health, Quality of Life, OHIP-14, DMF Index, Sociodemographic Factors, Alcoholism.

Fatores associados à qualidade de vida relacionada a saúde oral (OHRQoL) em alcoolistas: um estudo transversal

Resumo:
Introdução: apesar de bem consolidado os fatores associados com a qualidade de vida geral nos pacientes alcoolistas, não existem estudos até o momento que avaliem os fatores associados com a qualidade de vida associada a saúde oral desses indivíduos. Assim, o objetivo desse artigo foi avaliar o impacto de fatores sociodemográficos, higiene bucal, consumo de álcool e cigarros bem como do índice de dentes cariados, perdidos e obturados (CPOD) na qualidade de vida relacionada à saúde bucal (OHRQoL) de pacientes alcoolistas. Métodos: estudo do tipo transversal com uma amostra de 400 homens adultos. O índice CPOD foi aplicado por examinador calibrado (kappa=0,85 interexaminador, kappa=0,9 intraexaminador). A autopercepção em saúde bucal foi medida por meio do Oral Health Impact Profile na versão curta (OHIP-14). Foi feita análise descritiva e a regressão de Poisson univariada e multivariada com variância robusta. Valores de p<0,05 indicaram significância estatística. Resultados: não foram detectadas associações estatisticamente significativas entre fatores sociodemográficos e OHRQoL. Entretanto, a higiene bucal representada pelo uso de creme dental (p=0,016), autopercepção de gosto metálico (p=0,011) e autopercepção de mobilidade dentária (p=0,019); consumo de álcool (p=0,009) e índice CPOD (p=0,034) foram associados a impacto negativo na OHRQoL. Discussão: o estudo possui limitações envolvendo o possível risco de viés de memória. No entanto, o estudo traz à tona a complexidade da qualidade de vida e saúde bucal em uma população marginalizada. Conclusão: os hábitos de higiene, o maior consumo de álcool e o índice CPOD são fatores que levam a uma baixa OHRQoL.
Palavras-chave: Distribuição espacial, Pipericultura, Krigagem, Índice de vegetação, *Piper nigrum*.

Factores asociados con la calidad de vida relacionada a la salud oral en pacientes alcohólicos: un estudio transversal

Resumen:
Introducción: si bien los factores asociados a la calidad de vida general en pacientes alcohólicos están bien establecidos, hasta la fecha no existen estudios que evalúen los factores asociados a la calidad de vida asociada a la salud bucal de estos individuos. Así, el objetivo de este artículo fue evaluar el impacto de los factores sociodemográficos, la higiene bucal, el consumo de alcohol y cigarrillos, así como el índice de dientes cariados, perdidos y obturados (CPOD) en la calidad de vida relacionada con la salud bucal (OHRQoL) de pacientes alcohólicos. Métodos: estudio transversal con una muestra de 400 hombres adultos. El índice CPOD fue aplicado por un examinador calibrado (kappa=0,85 interexaminador, kappa=0,9 intraexaminador). La autopercepción de la salud bucal se midió utilizando la versión corta del Perfil de Impacto en la Salud Bucal (OHIP-14). Se realizaron análisis descriptivos y regresión de Poisson univariada y multivariada con varianza robusta. Valores de p<0,05 indicaron significación estadística. Resultados: no se detectaron asociaciones estadísticamente significativas entre los factores sociodemográficos y la OHRQoL. Sin embargo, la higiene bucal representada por el uso de pasta dental (p=0,016), autopercepción de sabor metálico (p=0,011) y autopercepción de movilidad dental (p=0,019); el consumo de alcohol (p=0,009) y el índice CPOD (p=0,034) se asociaron con un impacto negativo en la OHRQoL. Discusión: el estudio tiene limitaciones relacionadas con el posible riesgo de sesgo de memoria. Sin embargo, el estudio saca a la luz la complejidad de la calidad de vida y la salud bucal en una población marginada. Conclusión: los hábitos de higiene, el mayor consumo de alcohol y el índice CPOD son factores que conducen a una baja CVRS.
Palabras clave: Salud bucal, Calidad de vida, OHIP-14, índice CPOD, Factores Sociodemográficos, Alcoholismo.

INTRODUCTION

Alcohol, when misused, favors a lifestyle that can lead to social, economic and health problems. Thus, abusive alcohol consumption is considered a worldwide public health problem (Chamsi-Pasha *et al*., 2020). In addition, excessive alcohol consumption is a risk factor in relation to oral diseases since it influences the oral cavity, leading to a predisposition to caries, periodontal disease, and head and neck cancers (Çetinkaya and Romaniuk, 2020). Oral health influences overall health, as well as having an impact on quality of life (Su *et al*., 2021).

In order to evaluate the impact of oral health-related quality of life (OHRQoL), multidimensional instruments have been created (Spanemberg *et al*., 2019). For example, Slade and Spencer developed the Oral Health Impact Profile (OHIP) in 1994 (Slade and Spencer, 1994). A reduced version was developed in 1997 with 14 questions and the following seven domains: functional limitation; physical pain; psychological discomfort; physical disability; psychological disability; social disability; and handicap (Slade, 1997). In 2005 the OHIP-14 was validated and adapted for a Brazilian Portuguese version by Oliveira and Nadanovsky (Oliveira and Nadanovsky, 2005).

There is a lack of studies that investigate the impact of the OHRQoL on alcoholics. Therefore, the aim of this study was to evaluate the impact of sociodemographic data, oral hygiene, alcohol and cigarettes consumption and DMFT index on OHRQoL in alcoholics in rehabilitation. The hypothesis is that sociodemographic factors, DMFT and health-related behaviours have an impact on the OHRQoL in relation to these individuals.

MATERIALS AND METHODS

Ethical considerations

This study was approved by the Ethics Committee in Research of the Federal University of Paraná (number: CEP/SD 1.484.792). following the declaration of Helsink and guidelines STROBE for cross-sectional studies.

Study design

A cross-sectional study was conducted in two hospitals for the treatment of chemical dependence in the Brazilian state of Paraná: these were the *Hospital San Julian* (San Julian Hospital) and the *Instituto de Pesquisa e Tratamento do Alcoolismo* (Institute of Research and Treatment of Alcoholism), located in the municipalities of Piraquara and Campo Largo, respectively, from December 2013 to March 2017. These hospitals only admit male patients. Were included in the study institutionalized alcoholics with aged over 18. Was excluded users of other psychoactive substances apart from tobacco and users without mental conditions to answer by themselves forms.

Data collection and questionnaires

The participants responded to a structured questionnaire, which was conducted as an interview by a trained examiner. The questionnaire included sociodemographic data, oral hygiene, and data regarding the times and amounts of alcohol and cigarette consumption. Information about these questionnaires was exemplified in the data analysis session.

The OHIP-14 questionnaire was administered through interviews by a single trained researcher (DHW) to measure the impact on OHRQoL for the period of twelve months prior to admission, how was made by previous studies (Slade *et al*., 2005). The participants were asked how frequently they experienced negative impacts in terms of functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap (OHIP-14 domains). The rating scale response options were scored as follows: never = 0; hardly ever = 1; occasionally = 2; fairly often = 3; very often = 4.

The OHIP-14 scores were dichotomized as the presence of negative impact on quality of life (when the response is ‘fairly often’ or ‘very often’) or absence of negative impact (when the response is ‘never’, hardly ever’ or ‘occasionally’) for the analysis of associations and calculated the prevalence.

A calibrated examiner by the guidelines of the WHO, performed an oral examination according to the DMFT index, and evaluated the previous caries experience of the individuals,

classification a presence or absence of caries, obturation and tooth loss (WHO 2013). In order to obtain intra-examiner agreement, these individuals were re-evaluated after one week. The Kappa values obtained were 0.85 for the inter-examiner and 0.90 for the intra-examiner.

Data analysis

The data analysis was performed using *Stata/SE 14.1* software (*StataCorp LP*, USA). Descriptive and Poisson's univariate regression analysis were used to test the associations between OHRQoL and the other variables. The variables with p<0.20 in the univariate analysis were included in the Poisson multiple regression model with robust variance. P values<0.05 indicated statistical significance.

The DMFT index score and the daily amount of alcohol consumption were adjusted using an ROC curve. The daily amount of alcohol consumed was evaluated in relation to standard drink and converted into milliliters of pure alcohol per day taking as reference: one standard drink = 17 ml of pure alcohol (ethanol)

The median was considered as the cutoff point for the other quantitative variables to simplify the statistical analysis. The sociodemographic variables were dichotomized as follows: years of age: <44 or ≥44; skin colour: white or non-white (brown, black, indigenous and yellow); marital status: married/stable union or single (single, widowed and divorced); years of schooling: ≥8 or <8; employment before hospitalization: yes or no; resides alone: alone or with someone (wife, parents, siblings, grandparents and others).

The oral hygiene included the following: brushing of teeth: yes or no; tooth brushing frequency per day: ≥3 or <3; use of toothpaste: yes or no; use of dental floss: yes or no; self-perceived metallic taste: yes or no; self-perceived tooth mobility: yes or no; last dental appointment in years: <2 or ≥2; amount of teeth present in the mouth: ≥20 or <20; alcohol and tobacco consumption: time of alcohol consumption in years: ≥22 or <22; time of tobacco consumption in years: ≥24 or <24; and amount of cigarettes consumed per day: ≥20 or <20.

RESULTS

The study included 400 subjects with a mean age of 44.3 years (SD= 10.2; median=44.0; range: 19 to 70). There was a predominance of white (67.3%), single (67.0%), employed (67.0%) and low educational level (56.5%) individuals. A total of 71.0% of the alcoholics reported being smokers.

The mean total OHIP-14 score (severity) was 19.0 (SD = 12.1; median=18; range: 0 to 56). The prevalence of negative impact on OHRQoL was 78.0% (n=312). The items that demonstrated the highest prevalence of negative impact were psychological discomfort and psychological disability (57.3% and 51.5%, respectively) (Table1).

Table 1 – Mean severity scores and prevalence of impact for OHIP-14 items in alcoholics, Paraná, Brazil, 2017.

OHIP-14	Mean ±SD[a]	Median [a] (min-max)	Prevalence [b] n (%)
Functional limitation	2.1 ±2.1	2 (0 - 8)	102 (25.5)
Physical pain	3.2 ±2.4	3 (0 - 8)	150 (37.5)
Psychological discomfort	4.2 ±2.7	4 (0 - 8)	229 (57.3)
Physical disability	2.3 ±2.4	2 (0 - 8)	125 (31.3)
Psychological disability	3.2 ±2.3	3 (0 - 8)	206 (51.5)
Social disability	1.7 ±2.1	1 (0 - 8)	74 (18.5)
Handicap	2.3 ±2.2	2 (0 - 8)	151 (37.8)
Total OHIP	19.0 ±12.1	18 (0 - 56)	312 (78.0)

a. Sum of scored responses (potential range 0–28 for 7 items and for 0–56 for 14 items).
b. Proportion of respondents reporting one or more items 'fairly often' or 'very often'. SD = standard deviation.
Source: Authors.

No statistically significant associations were detected between the sociodemographic factors and the OHRQoL. The data are summarized in Table 2.

In the univariate analysis, the oral hygiene was associated with negative impact on 'no teeth brushing habits' (prevalence ratio [PR]=1.22; confidence interval [CI]:1.08-1.39), 'no use of toothpaste' (PR=1.20; CI: 1.07-1.36), 'self-perceived metallic taste' (PR=1.22; CI: 1.11-1.34), and 'self-perceived tooth mobility' (PR=1.16; CI:1.05-1.29). However, the 'brushing of teeth' variable had only one negative response regarding the absence of negative impact and was therefore not included in the multivariate analysis.

The values for pure alcohol consumption were statistically significant (PR=1.18; CI: 1.03-1.35) (Table 2). Scores greater than ≥312.5 mL were considered for the daily consumption of pure alcohol (ROC curve) and were associated with a negative impact on the OHRQoL.

The mean DMFT score was 17.0 (SD=7.5; median=17.0; range 0 to 28) and the cut-off point was 19 (ROC curve). The DMFT score ≥19 (PR=1.11; CI:1.00-1.23) was associated with a worse self-perception of impact (Table 2).

Table 2 – Sociodemographic characteristics, oral health habits and conditions, alcohol and tobacco consumption, and the impact of oral health-related quality of life in alcoholics, Paraná, Brazil, 2017.

Variables	Impact		Total	p*	PR
	Absence	Presence	n (%)		(CI 95%)
Years of age					
< 44	41 (20.6)	158 (79.4)	199 (49.8)		0.96
≥ 44	47 (23.4)	154 (76.6)	201 (50.3)	0.502	(0.87-1.07)
Skin colour					
White	61 (22.7)	208 (77.3)	269 (67.3)		1.03
Non-white	27 (20.6)	104 (79.4)	131 (32.8)	0.634	(0.92-1.14)
Marital status					
Married	31 (23.5)	101 (76.5)	132 (33.0)		1.03
Single	57 (21.3)	211 (78.7)	268 (67.0)	0.621	(0.92-1.15)
Years of schooling					
≥ 8	44 (25.3)	130 (74.7)	174 (43.5)		1.08
<8	44 (19.5)	182 (80.5)	226 (56.5)	0.172	(0.97-1.2)
Employment					

Yes	56 (20.9)	212 (79.1)	268 (67.0)		0.96
No	32 (24.2)	100 (75.8)	132 (33.0)	0.459	(0.85-1.07)
Resides alone					
Yes	20 (17.1)	97 (82.9)	117 (29.3)		1.09
No	68 (24.0)	215 (76.0)	283 (70.8)	0.104	(0.98-1.21)
Brushing of teeth					
Yes	87 (22.8)	295 (77.2)	382 (95.5)		1.22
No	1 (5.6)	17 (94.4)	18 (4.5)	**0.002**	(1.08-1.39)
Tooth brushing frequency (days)					
≥ 3	37 (24.8)	112 (75.2)	149 (37.3)		1.06
< 3	51 (20.3)	200 (79.7)	251 (62.8)	0.305	(0.95-1.19)
Use of toothpaste					
Yes	86 (23.1)	287 (76.9)	373 (93.3)		1.20
No	2 (7.4)	25 (92.6)	27 (6.8)	**0.003**	(1.07-1.36)
Use of dental floss					
Yes	26 (27.1)	70 (72.9)	96 (25.9)		1.10
No	55 (20.0)	220 (80.0)	275 (74.1)	0.180	(0.96-1.26)
Self-perceived metallic taste					
No	77 (26.5)	214 (73.5)	291 (72.8)		1.22
Yes	11 (10.1)	98 (89.9)	109 (27.3)	**<0.001**	(1.11-1.34)
Self-perceived tooth mobility					
No	61 (26.4)	170 (73.6)	231 (62.3)		1.16
Yes	20 (14.3)	120 (85.7)	140 (37.7)	**0.004**	(1.05-1.29)
Last dental appointment (years)					
< 2	37 (23.6)	120 (76.4)	157 (44.7)		1.03
≥ 2	41 (21.1)	153 (78.9)	194 (55.3)	0.588	(0.92-1.16)
DMFT					
< 19	56 (25.7)	162 (74.3)	218 (54.5)		1.11
≥ 19	32 (17.6)	150 (82.4)	182 (45.5)	**0.049**	(1.00-1.23)
Amount of teeth present in the mouth					

< 20	39 (20.7)	149 (79.3)	188 (47.0)		0.97
≥ 20	49 (23.1)	163 (76.9)	212 (53.0)	0.567	(0.87-1.08)
Time of alcohol consumption (years)					
< 22	47 (24.2)	147 (75.8)	194 (48.5)		1.06
≥ 22	41 (19.9)	165 (80.1)	206 (51.5)	0.299	(0.95-1.17)
Daily pure alcohol consumption (mL)					
< 312.5	35 (31.0)	78 (69.0)	113 (28.3)		1.18
≥ 312.5	53 (18.5)	234 (81.5)	287 (71.8)	**0.016**	(1.03-1.35)
Time of tobacco consumption (years)					
< 24	32 (22.9)	108 (77.1)	140 (49.0)		1.06
≥ 24	27 (18.5)	119 (81.5)	146 (51.0)	0.364	(0.94-1.19)
Number of cigarettes (day)					
< 20	23 (18.1)	104 (81.9)	127 (44.3)		0.95
≥ 20	36 (22.5)	124 (77.5)	160 (55.7)	0.356	(0.84-1.06)

*p-value refers to Poisson univariate regression analysis; Bold results are statistically significant, p< 0.05; PR= prevalence ratio; CI= confidence interval.
Source: Authors.

'Use of toothpaste' (1.12; CI: 1.02-1.23); 'self-perceived metallic taste' (PR=1.14; CI: 1.03-1.26); 'self-perceived tooth mobility' (PR=1.13; CI:1.02-1.25); 'daily pure alcohol consumption' (PR=1.22; CI:1.05-1.41); and 'DMFT' (PR=1.12; CI:1.01-1.24) were associated with a negative impact on the OHRQoL in the multivariate analysis (p<0.05) (Table 3).

Table 3 – Multivariate analysis of sociodemographic characteristics, oral health, alcohol use and impact on oral health-related quality of life.

Variables	Classification of risk	*p***	PR (CI 95%)
Years of schooling	< 8 years	0.759	1.02 (0.91-1.14)
Resides alone	Yes	0.212	1.07 (0.96-1.19)
Use of toothpaste	No	**0.016**	1.12 (1.02-1.23)
Use of dental floss	No	0.388	1.06 (0.93-1.21)
Self-perceived metallic taste	Yes	**0.011**	1.14 (1.03-1.26)
Self-perceived tooth mobility	Yes	**0.019**	1.13 (1.02-1.25)

Daily pure alcohol consumption (mL)	≥312.5	**0.009**	1.22 (1.05-1.41)
DMFT	≥19	**0.034**	1.12 (1.01-1.24)

**p-value refers to Poisson multivariate regression analysis; Bold results are statistically significant <0.05; PR= prevalence ratio; CI= confidence interval.
Source: Authors.

DISCUSSION

The literature contains a few studies regarding the OHRQoL using OHIP-14 in relation to institutionalized alcoholics. This study found the sociodemographic data are not associated with OHQoL, but factors such as non-use of toothpaste, self-perceived metallic taste, self-perceived tooth mobility, a higher amount of alcohol consumed, high DMFT values were negatively affected the OHRQoL of the participants.

Oral hygiene, such as flossing and toothpaste use, have an impact on quality of life (Lawal *et al.*, 2022). In the present study, the alcoholics who did not use toothpaste had negative impacts on their OHRQoL, which was similar to the results of other studies with non-alcoholic individuals (Mashoto *et al.*, 2010). Carelessness with oral hygiene and dental treatment can result in pain, tooth mobility and loss, affecting the OHRQoL (Jang *et al.*, 2015). It is known that correct oral hygiene behaviour provides healthier oral conditions and a better OHRQoL (Shao *et al.*, 2018).

Another aspect that had a negative impact on the OHRQoL of the alcoholics in this study was a self-perceived metallic taste (dysgeusia). This condition has several causes that can be found in alcoholics, such as dental procedures like extraction and the treatment of abscesses, the use of dental prostheses, the presence of dental caries and periodontal diseases (Syed *et al.*, 2016). In addition, the use of antidepressant and anxiolytic drugs that are commonly used to treat dependency may contribute to this symptom. Another possible factor leading to dysgeusia is tobacco use, and in the present study 71.0% of the participants were smokers. Alterations in the perception of taste may lead to an aversion to some foods, thereby impairing an ideal diet and potentially leading to reduced strength, muscle mass, function and quality of life. Dysgeusia also reduces the ability to differentiate the intensity or concentration of flavours, which can lead to an increase in salt and sugar intake (Syed *et al.*, 2016). Excessive intake of sugar can result in an increase in the number of caries.

Self-perceived tooth mobility is also associated with worse OHRQoL values in alcoholics. Tooth mobility can be related to periodontal disease, which was subjectively evaluated in this study. There is evidence of the association of periodontal disease and OHRQoL; the greater the severity of the disease, the greater the negative impact on the OHRQoL (Ferreira *et al.*, 2017). In addition, harmful alcohol consumption is one of the risk factors for periodontitis and, once again, the greater the consumption, the greater the severity of the disease (Hach *et al.*, 2015).

Almoznino *et al.* observed that alcohol consumption is significantly correlated with OHIP-14 scores, and that, in addition to general and oral health impacts, it has psychosocial consequences, i.e. a negative impact on quality of life (Almoznino *et al.*, 2015). The present study supports the finding that the higher the level of alcohol consumption, the greater the negative impact on the OHRQoL of an individual. Indeed, this harmful habit was significantly correlated with the OHRQoL maybe because it worsened oral conditions such as dental caries, the need for dental fillings, missing teeth, periodontal disease and dysgeusia.

The prevalence of negative impact in the present study showed higher values (78.0%) than those observed in other international population-based studies involving similar age groups (adults and the elderly). The values for England, 16.4% (Guarnizo-Herreño *et al.*, 2014) were higher compared with studies in non-alcoholic populations of the southeastern regions (35.0%) of Brazil (Miotto *et al.*, 2012). Alcohol consumption has an important impact on OHIP-14 scores. Furthermore, the OHIP-14 can be related to different health determinants and may reflect social and cultural differences, as well as the availability of health services for these populations (Slade *et al.*, 2005).

The present study found that high DMFT values had a negative impact on the OHRQoL of the alcoholics. This finding corroborates previous studies that applied the OHIP-14 to different populations and identified that the worst oral conditions corresponded to the highest OHIP-14 values (Pereira *et al.*, 2021).

Regarding the limitations of the present study, the questionnaire data were self-reported and the responses were subjective. Thus, there may have been some risk of memory or information bias. But, developing studies within a hospital environment with alcoholics, in which self-perceived oral health is approached and opinions are considered, brings to light

the complexity of quality of life that is closely related to behavioural aspects and oral health. A multidimensional perspective can help in the planning and implementation of public policies focused on the reduction of damage caused by alcohol abuse in order to improve the general and oral health conditions of this population.

CONCLUSION

It was concluded that the worst oral hygiene habits and the high level of consumption alcohol are factors which lead to a poor oral health-related quality of life.

ACKNOWLEDGMENTS

The authors would like to thanks Associação San Julian and Associação de Pesquisa e Tratamento do Alcoolismo for allowing the research to take place at Hospitals. Also thanks Fundação Araucária for financial support, grant number 568/2013 and 322/2014.

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