RESEARCH PAPER

THE IMPACT OF ORAL HEALTH LITERACY ON ORAL HEALTH-RELATED BEHAVIOURS AMONG UNIVERSITY STUDENTS – A CROSS-SECTIONAL STUDY

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ABSTRACT

INTRODUCTION: *Oral health literacy (OHL) is a significant determinant of an individual's oral health-related behaviours, outcomes, and total quality of life. This paper aims to assess the OHL of KNUST students and its effect on oral health-related behaviour.*

METHODS: *This is a cross-sectional study. Participants were selected via simple random sampling. A self-administered questionnaire and the REALD-30 OHL assessment toolkit were used to collect data. Statistical analysis was performed using Stata 14. Multiple linear regression analysis was performed to examine the statistical relationship between OHL and oral health-related behaviours.*

RESULTS: *The mean OHL score was 12.10 out of 30, with 88.50%, 8.82% and 2.67% having low, moderate, and high OHL levels, respectively. OHL levels significantly predicted dental visits (C=-0.15, p=0.013), their frequency (C=-0.29, p=0.008) and toothbrushing frequency (C=-0.199, p=0.006).*

DISCUSSION: *OHL levels significantly predicted dental visits, their frequency, and toothbrushing frequency. These findings agree with similar studies conducted around the world.*

CONCLUSION: *Efforts by health services and providers should be made to improve OHL in the study and the general populace to reap the benefits of improvements in oral health-related and general quality of life.*

Keywords: Oral health, Oral health literacy, oral health-related behaviours

INTRODUCTION

Oral Health Literacy (OHL) is "the capability of a person to acquire, process and appreciate basic oral health information (knowledge)- and services needed to make appropriate choices regarding their oral health" (Firmino et al., 2018). The idea of OHL was modelled after the concepts of health literacy and has been used to explain the roles of education, culture, and health systems in determining health outcomes through the transmission of knowledge (Vernon et al., 2003). Several studies have shown that better health outcomes are related to higher levels of health literacy. Oral health literacy has gained prominence over the past decade. Evidence suggests that individuals with higher OHL levels better utilize dental care services, report enhanced self-efficacy in practising oral health-related behaviours and have superior oral health outcomes than their less 'literate' counterparts (Baskaradoss, 2018).

Oral health behaviours focus on maintaining, restoring, and improving oral health, corresponding with the primordial, primary, secondary, and tertiary levels of prevention (Dawoe, Unpublished).

Oral health literacy in sub-Saharan Africa is very low, adversely influencing interest in oral health and utilization of related services, resulting in lower quality of life, loss of school and work hours, and increased costs due to late presentation (Barzel and Holt, 2019). Comprehensive searches by the author on HINARI, PubMed and Google Scholar databases produced no results of significance for OHL in Ghana or Africa. However, several studies in African populations on oral health awareness, behaviours, and service utilization were referenced in this work, with only two of these, Deh (2015) and Nimako Boateng et al. (2016), being conducted in a university community.

The paper sought to assess the OHL levels among Kwame Nkrumah University of Science and Technology (KNUST) students and their influence on their oral health practices.

METHODS

This study employed a cross-sectional design to examine OHL and oral health-related behaviour from the KNUST student perspective. A sample size of 381 was determined using the EpiInfo StatCalc sample size calculator. The inputs were as follows: Population: 45,000; Confidence level: 95%; Margin of error: 5%; expected frequency: 50%. Study participants were selected using a simple random sampling method. Only KNUST students were included in the study.

A self-administered questionnaire and standard 30-item OHL toolkit (Rapid Estimate of Adult Literacy in Dentistry-30 [REALD-30]) were used in data collection. The REALD toolkit is a word recognition tool developed from the Rapid Estimate of Adult Literacy in Medicine (REALM) (Lee et al., 2007), and was chosen for its simplicity in understanding and usage. The REALD-30 toolkit for OHL assessment was used to assess the OHL of students, scores of 0-30 were assigned, and students were grouped into "levels" based upon the class of score obtained (low [0-19], moderate [20-24] and high [25-30]). Data were entered in Excel and exported to Stata 14 for correlation and multiple regression analysis. The dependent variables considered were Dental Visits, Frequency of dental visits, Tooth Brushing Frequency, and Sugary food consumption, while the independent variable was Oral Health Literacy levels.

RESULTS

Socio-demographic characteristics of respondents

Three hundred and eighty-one (381) students from various departments and halls or hostels of residence received questionnaires, of which 374 (a response rate of 98.16%) responded.

Males were 204 (54.55%), while females were 170 (45.55%), aged between 17 and 44. The mean age was 21.27 years. The rest of the demographic information is illustrated in Table 1.

Table 1. Basic Demographics

Characteristic	Frequency (Persons) N=374	Percentage (%)
Gender		
Male	204	54.55
Female	170	45.45
Age group		
<20	68	18.18
20-25	295	78.88
>25	11	2.94
College		
Agriculture and Natural Resources	28	7.49
Health Sciences	64	17.11
Humanities and Social Sciences	120	32.09
Art and Built Environment	53	14.17
Engineering	61	16.31
Sciences	48	12.83

Oral health-related behaviours of respondents

Of the 374 respondents, 247 (66.04%) had exposure to forms of oral health education or information. 250 (66.82%) respondents had used or visited a dental care facility at least once in their lifetime. Only five respondents (1.36%) visited a dentist every three months. Seventeen respondents (4.63%) visited a dentist every six months, while 20 (5.45%) visited a dentist every year. Regarding sugary foods and drinks, 165 (44.14%) indulged in such regularly.

Regarding toothbrushing frequency, 152 respondents (40.64%) brushed once daily. Two hundred five persons (54.81%) brushed twice daily, while 17 (4.55%) brushed more than twice daily. Table 1 summarizes data on oral health-related behaviours.

The mean OHL score was 12.10, with a modal score of 10. Twenty (20) students scored zero (0), and one (1) had a perfect score of 30. A low OHL level was observed in 331 (88.5%) respondents; 33 (8.8%) had a moderate OHL level, while only 10 (2.7%) had scores which translated to a high OHL level. Table 2 summarizes data on the different OHL scores and levels.

Table 2. Oral Health-Related Behaviours Among Students

ANSWER	FREQUENCY (N)	PERCENTAGE (%)
EXPOSURE TO ORAL HEALTH EDUCATION		
Yes	247	66.04
No	127	33.96
EVER VISITED DENTIST		
Yes	250	66.82
No	124	33.18
CONSUMPTION OF SUGARY FOODS AND DRINKS		
Yes	165	44.14
No	208	55.86
FREQUENCY OF TOOTHBRUSHING		
Once daily	152	40.64
Twice daily	205	54.81
More than twice	17	4.55
FREQUENCY OF DENTAL VISITS		
Three monthly	5	1.36
Six monthly	17	4.63
Once yearly	20	5.45
Rarely	131	35.69
Never	194	52.86
SUMMARY OHL LEVELS		
Low	331	88.5
Moderate	33	8.8
High	10	2.7

Influence of oral health literacy on oral health-related behaviours

Multiple regression analysis of the effect of OHL on oral health-related behaviours could significantly relate usage of dental or oral health facilities [$F_{(1, 363)}$ = 6.20, p = 0.0132], frequency of dental visits [$F_{(1, 363)}$ = 7.21, p = 0.0076] and tooth brushing frequency [$F_{(1, 363)}$ = 7.26, p = 0.0059] to OHL scores, with 1.68%, 1.95% and 2.07% of the respective variances accounted for. Dental visit status (C=-0.15, p=0.013), frequency of visit (C=-0.29, p=0.008) and toothbrushing frequency (C=-0.199, p=0.006) were also significantly predicted by OHL levels. The models showed no statistically significant relationship between the consumption of sugary foods, drinks, and OHL levels. Table 3 displays the results of the regression analysis.

Table 3. Summary of the Relationship between Key Oral Health-Related Behaviours and OHL Levels

Equation	Observations	Parms	Root Mean Square Error	"R-squared"	F	P-value
Dental Visits	365	2	.4871046	0.0168	6.198222	0.0132
Frequency of Visits	365	2	.8756624	0.0195	7.213463	0.0076
Toothbrushing Freq.	365	2	.5812148	0.0207	7.670467	0.0059
Sugary food consumption	365	2	.4977727	0.0004	.1625755	0.6870

DISCUSSION

Adapting the 1998 World Health Organisation (WHO) definition of health behaviour, oral health behaviour may be defined as any action that is performed by an individual for the promotion, protection, and maintenance of oral hygiene regardless of perceived or actual oral health status, whether such activity was helpful towards the intent, or not. Oral health behaviours are influenced by individual, interpersonal, institutional, communal, and public policy factors, forming a complex interplay with the cultural, societal, educational and health system interactions and oral health literacy (Sharma, 2016).

Several measures for assessing OHL

Healthful oral care behaviours include preventive dental check-ups, professional dental prophylaxis, twice-daily toothbrushing habits, flossing, reduction of sugary food intake, chewing miswak (chewing stick) and general utilization of dental services for fillings, extractions, and prosthesis (Al-Batayneh et al., 2014). Oral health-related behaviours evaluated in this study were significantly related to levels of OHL. A study by Sistani et al. (2017) in Tehran, Iran, showed a significant relationship between higher OHL levels and improvements in oral health-related behaviours such as toothbrushing frequency (more than once daily), consumption of sugary foods and snacks (less than one sugary snack a day) and frequency of dental visits (at least every six months).

Batista et al. (2017) identified OHL as a significant predictor of specific oral health-related behaviours such as dental flossing, toothbrushing frequency more than once, and more regular dental health services utilization. It was also noted that people with higher OHL levels tend to appreciate the services more.

Though this study does not cover the full scope of oral health behaviours and their possible relations to OHL, there are positive signs of the possibility of improving oral health behaviours, attitudes, and status of people if an effort is invested in improving the oral health literacy levels of people through rigorous oral health education and promotion.

The main limitations of this study are as follows:

1. The non-existence of African studies on the topic of Oral health literacy made it impossible to compare within the African context.

2. A broader scope of oral health behaviours was not explored.

3. Possible predictors of oral health literacy, such as ethnicity and socioeconomic classes, were not considered, as this could

give a more practical idea about the topic under study.

CONCLUSIONS

Oral health is vital in determining individuals' general quality of life. It is primarily affected by individuals' oral health literacy, which has been demonstrated to be of significant worth in shaping oral health-promoting attitudes and behaviours. OHL must therefore be intentionally targeted for improvement in oral health, quality of life, and well-being of the populace.

REFERENCES

Al-Batayneh, O.B., Owais, A.I. and Khader, Y.S., 2014. Oral health knowledge and practices among diverse university students with access to free dental care: A cross-sectional study. Open Journal of Stomatology, 2014.

Barzel, R. and Holt, K., 2019. Promoting Oral Health in Schools: A Resource Guide.

Baskaradoss, J.K., 2018. Relationship between oral health literacy and oral health status. BMC Oral Health, 18(1), pp.1-6.

Batista, M.J., Lawrence, H.P. and Sousa, M.D.L.R.D., 2018. Oral health literacy and oral health outcomes in an adult population in Brazil. BMC Public Health, 18(1), pp.1-9.

Deh, S.K., 2015. Economic Burden of Dental Diseases of Patients Attending the Dental Unit of University Hospital, Legon (Doctoral dissertation, University of Ghana).

Firmino, R.T., Martins, C.C., Faria, L.D.S., Martins Paiva, S., Granville–Garcia, A.F., Fraiz, F.C. and Ferreira, F.M., 2018. Association of oral health literacy with oral health behaviours, perception, knowledge, and dental treatment-related outcomes: A systematic review and meta-analysis. Journal of public health dentistry, 78(3), pp.231-245.

Lee, J.Y., Rozier, R.G., Lee, S.Y.D., Bender, D. and Ruiz, R.E., 2007. Development of a word recognition instrument to test health literacy in dentistry: the REALD-30–a brief communication. Journal of public health dentistry, 67(2), pp.94-98.

Nimako-Boateng, J., Owusu-Antwi, M. and Nortey, P., 2016. Factors affecting dental diseases presenting at the University of Ghana Hospital. SpringerPlus, 5(1), pp.1-8.

Sharma, M., 2021. Theoretical foundations of health education and health promotion. Jones & Bartlett Learning.

Sistani, M.M.N., Virtanen, J., Yazdani, R. and Murtomaa, H., 2017. Association of oral health behaviour and the use of dental services with oral health literacy among adults in Tehran, Iran. European journal of dentistry, 11(02), pp.162-167.

Vernon, J.A., Trujillo, A., Rosenbaum, S.J. and DeBuono, B., 2007. Low health literacy: Implications for national health policy.