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Oral health status of outpatients with mental disorders in a specialist tertiary hospital in Enugu State, Nigeria

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Abstract

Background This study assessed the caries experience and gingival health of outpatients with mental disorders, comparing those with psychotic disorders to those with non-psychotic disorders at a specialist psychiatry clinic. Oral health is vital for overall health, making it essential to examine the oral health status of these individuals with a focus on specific variables.

Methods A quantitative descriptive cross-sectional study was conducted at the Federal Neuropsychiatric Hospital psychiatry clinic in Enugu State, Nigeria, between May and June 2023. Data on demographic variables were collected from 260 respondents using an interviewer-administered questionnaire. Oral health status was clinically assessed using the Decayed, Missing, and Filled Teeth (DMFT) index, the Oral Hygiene Index-Simplified (OHI-S), and the Gingival Index (GI). Data were analyzed using SPSS version 25, with significance at $p < 0.05$.

Results Out of 260 respondents, 155 (60%) had psychotic disorders, while 105 (40%) had non-psychotic disorders. Both groups had low mean DMFT scores of $1.0 \pm (1.07)$ for psychotic and $1.0 \pm (0.9)$ for non-psychotic disorders. The OHI-S indicated that 68 (69.4%) of patients with psychotic disorders and 30 (30.6%) of those with non-psychotic disorders had poor oral hygiene. Additionally, 137 (58.5%) participants in the psychotic group and 97 (41.5%) in the non-psychotic group brushed their teeth once daily. A total of 145 (58.9%) participants in the psychotic group and 101 (41.1%) in the non-psychotic group did not receive assistance while brushing. Furthermore, 98 (59.8%) participants in the psychotic group and 66 (40.2%) in the non-psychotic group did not consume alcohol, while 149 (59.1%) in the psychotic group and 103 (40.9%) in the non-psychotic group were non-smokers.

Conclusion Participants exhibited low caries experience due to their motivation to practice self-care, as evidenced by a majority brushing at least once daily without assistance, utilizing a toothbrush and toothpaste, and low alcohol consumption and tobacco use. However, poor oral hygiene persisted, particularly among those with psychotic disorders compared to non-psychotic disorders. This highlights the importance of integrating oral health education, counselling, and routine intraoral examinations in the care of psychiatric patients to prevent the onset or progression of oral diseases in this population.

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Keywords Mental health, Psychiatric patients, Oral hygiene, Oral health status

Background

Health is defined not just by the absence of disease or infirmity but also by the overall well-being of individuals, which includes their physical, mental, and social health [1]. These interrelated aspects that collectively contribute to an individual's overall wellness [2]. Notably, oral health is pivotal in one's general health, impacting essential functions such as eating, comfort, speech, appearance, and social acceptance [3]. Mental disorders, characterized by significant disturbances in cognition, emotional regulation, or behavior, often result in distress or impairment across critical areas of functioning [1]. Regrettably, oral health in individuals with mental impairments remains an overlooked yet crucial component of physical well-being.

Individuals with mental disorders (PWMD) experience a higher incidence of oral health issues than the general population, with problems such as dental cavities and gum disease being common [4]. Research shows that PWMD have considerable dental health needs and are three times more likely to lose all their teeth [5, 6]. Various factors contribute to this heightened risk, such as poor nutrition and oral hygiene, excessive sugar intake, substance abuse, limited dexterity, and financial constraints that hinder access to dental care [6]. Other issues like lack of motivation, dental anxiety, and side effects from certain psychiatric medications—including dry mouth and gum problems—also increase their susceptibility to dental cavities and other oral health diseases. Furthermore, PWMD often underutilize dental services [5, 7, 8].

Mental disorders can be categorized into two types based on clinical presentation, severity, and management: psychotic disorders (PD) and non-psychotic disorders (NPD). Psychotic disorders involve cognitive or perceptual dysfunctions, like delusions or hallucinations, which meet specific diagnostic criteria [9]. Conversely, non-psychotic disorders do not present severe cognitive or perceptual disturbances. The differing clinical presentations of these disorders necessitate unique management strategies, which can influence an individual's quality of life and capacity to maintain proper oral hygiene, thereby affecting oral health outcomes [10].

Several indices are commonly used to assess an individual's oral health: the Decayed, Missing, and Filled Teeth (DMFT) index, which evaluates caries prevalence; the Community Periodontal Index (CPI), which measures periodontal health; the Oral Hygiene Index Simplified (OHI-S), which indicates overall oral health; and the Gingival Index (GI), which evaluates gingival inflammation [1].

Research in developed countries has shown that patients with mental disorders (PMDs) often exhibit poor oral health [11, 12]. For example, a study in Sweden revealed an average DMFT score of 10.5 (± 10.2) and reported that 41% of participants had poor oral hygiene [11]. In contrast, studies in low- and middle-income countries like India have reported a significantly lower average DMFT score of 2.10 (± 1.7) [13]. However, limited studies have been conducted on the oral health of patients with mental disorders in Africa.

A study in the southwest region of Ethiopia [14] found that the caries experience, as assessed by DMFT scores, was lower than that of the general population, which is inconsistent with findings from studies in southwestern Nigeria [15]. This discrepancy may be due to variations in age groups, the types of medications taken by psychiatric patients, and study durations. Despite the evidence of increased risks for poor oral health in this population, research into the link between oral and mental health in Nigeria remains sparse [16]. Therefore, a detailed study is needed in the Eastern zone, specifically using Enugu State as a case study, to evaluate caries experience and gingival health among individuals with schizophrenia (psychotic disorder) or anxiety and mood disorders (non-psychotic disorders) by utilizing the DMFT index, OHI-S, and GI.

Methods

Study background and setting

This study was conducted at Federal Neuropsychiatric Hospital Enugu (FNHE), a specialist tertiary hospital providing mental health services in Enugu state, Nigeria's South-East geopolitical zone.

Study design

This descriptive cross-sectional hospital-based study was carried out over one month at FNHE's outpatient psychiatry clinic. A consecutive sampling technique was used to collect information from 260 consenting outpatients with mental disorders who visited the FNHE psychiatry clinic from May to June 2023. All outpatients with a diagnosis of either psychosis (schizophrenia) or non-psychosis (anxiety disorder, depression and/or bipolar disorder) attending the psychiatry clinic in the reference hospital and are calm, stable, and on medications were included in the study. In contrast, in-patients in the reference hospital, uncooperative patients, patients who were functionally unable to speak, and patients with a diagnosis of other mental disorders not categorized as psychosis or non-psychosis were excluded. The minimum sample size was estimated using the standard formula for sample size

estimation for descriptive studies with a 95% confidence level, 5% acceptable margin of error and a prevalence of 24.3%, based on caries prevalence in a previous study of a similar population [16]. A 10% non-response rate was also considered to determine the sample size.

Data collection

After obtaining Ethical clearance (FNHE/HTR/REA/VOL.11/067) from the Health Research Ethics Committee of Federal Neuropsychiatric Hospital Enugu (FNHE), a signed informed consent form was obtained from participants, and in the case of minors (below 18 years), consent to participate was gotten from their parents or legal guardians. Legally authorized representatives of illiterate participants provided informed consent on their behalf. Illiterate participants who could not write were asked to do a thumbprint where consent was given in the presence of a witness, and the representative was also asked to sign beside the thumbprint.

Table 1 Socio-demographic characteristics of the study participants

| Variable | Frequency (No) | Percentage (%) |
|--|----------------|----------------|
| Age (years) | | |
| < 18 (15–17) | 8 | 3.1 |
| 18–25 | 42 | 16.2 |
| 26–35 | 78 | 30.0 |
| 36–45 | 72 | 27.7 |
| 46–55 | 31 | 11.9 |
| 55 and above | 29 | 11.1 |
| Gender | | |
| Male | 133 | 51.2 |
| Female | 127 | 48.8 |
| Area of residence | | |
| Urban area | 141 | 54.2 |
| Rural area | 119 | 45.8 |
| Highest level of education | | |
| Primary | 41 | 15.8 |
| Secondary | 96 | 36.9 |
| Tertiary | 115 | 44.2 |
| None | 8 | 3.1 |
| Employment status | | |
| Employed | 127 | 48.8 |
| Unemployed | 106 | 40.8 |
| Student | 22 | 8.5 |
| Not able to work (PWD) | 5 | 1.9 |
| Average monthly income of the employed | | |
| < ₦10,000 | 48 | 37.8 |
| ₦10,000 - ₦50,000 | 59 | 46.5 |
| ₦51,000 - ₦200,000 | 20 | 15.7 |

Data was collected using an interviewer-administered questionnaire, which was pre-tested on ten outpatients with mental disorders in the index hospital but was not included in the final results. The questionnaire was developed for this study, drawing from the authors' expertise and insights from existing literature. The questionnaire was subdivided into five sections. The first section captured the respondent's socio-demographic information. The second section captured the medical history and the diagnosis of their mental disorder, which were obtained from respondents and their respective case notes and grouped into psychotic and non-psychotic disorders as classified above. The third section captured the social history, which includes the consumption of alcohol, cariogenic food and cigarette smoking. The fourth section assessed the oral hygiene practices, including the tool used for teeth cleansing, the frequency of tooth brushing, and whether they were aided while brushing. The fifth section comprised intraoral examination using the Gingival Index (GI), Oral Hygiene Index Simplified (OHI-S), and the Decayed, Missing, and Filled Teeth (DMFT) index. A wooden spatula, gloves and face masks were employed during the intraoral examination [17].

Validity and reliability of instruments

The study instruments were validated using content validity to determine whether a representative sample of the behavior domain to be measured was covered. This entailed studying research instruments to ensure adequate representativeness of actual observations, which was certified by an expert in the field. To test for the reliability of the study instrument, 10 questionnaires were distributed to another group of respondents with characteristics similar to those of the main study respondents. The results obtained were identical.

Data analysis

The data collected was summarized using descriptive statistics for frequency distribution and percentages and inferential statistics to determine the p-value while comparing the two groups. This was done using the Statistical Product and Service Solutions (SPSS) software version 25. The Chi-square test (χ^2) was done. The P-value set at < 0.05 was considered significant.

Results

Socio-demographic characteristics of the study participants

One hundred and fifty-five (60%) patients had psychotic disorder (PD), while 105 (40%) patients had non-psychotic disorder (NPD).

Table 1 shows the socio-demographic characteristics of the patients. Most of the study participants ($n=78$, 30.0%) were between the ages of 26–35 years. There were

Table 2 Oral health findings on intraoral examination of participants using GI, OHI-S, and presence or absence of dental plaque/calculus

| Variables | PD (n = 155) No. (%) | NPD (n = 105) No. (%) | χ^2 (p-value) |
|--|-------------------------|-----------------------------|--------------------|
| Calculus | | | 10.7233 (0.001) |
| Present | 140(63.9) | 79(36.1) | |
| Absent | 15(36.6) | 26(63.4) | |
| Plaque | | | 11.1197 (0.001) |
| Present | 153(61.9) | 94(38.1) | |
| Absent | 2(15.4) | 11(84.6) | |
| Gingival Index | | | 39.0929 (0.000) |
| 0 - Normal gingiva | 5(15.6) | 27(84.4) | |
| 1 - Mild gingivitis | 97(64.2) | 54(35.8) | |
| 2 - Moderate gingivitis | 49(71.0) | 20(29.0) | |
| 3- Severe gingivitis | 4(50.0) | 4(50.0) | |
| Simplified oral hygiene index score (OHI-S) | | | 17.7748 (0.005) |
| (0-1-2) Good | 20(35.7) | 36(64.3) | |
| (1.3-3.0) Fair | 63(63.0) | 37(37.0) | |
| (> 3.1) Poor | 68(69.4) | 30(30.6) | |
| Not assessable | 4(66.7) | 2(33.3) | |

Table 3 Oral health findings on intraoral examination of participants using DMFT index

| DMFT | PD (n = 155) No. (%) | NPD (n = 105) No. (%) | χ^2 (p-value) |
|----------------|----------------------------|-----------------------------|--------------------|
| 0 | 97(58.8) | 68(41.2) | 0.91454 (0.902) |
| 1 | 16(57.1) | 12(42.9) | |
| 2 | 19(59.4) | 13(40.6) | |
| 3 | 7(63.6) | 4(36.4) | |
| 4 | 8(66.7) | 4(33.3) | |
| 5 | 2(50.0) | 2(50.0) | |
| 9 | 2(50.0) | 2(50.0) | |
| 10 | 2(100.0) | 0(0.0) | |
| 15 | 2(100.0) | 0(0.0) | |
| Mean (SD) DMFT | 1.0 (1.07) | 1.0 (0.9) | |

The DMFT score was categorized into <5.0=very low, 5.0-8.9=low, 9.0-13.9=moderate, > 13.9=high

according to the DMFT index classification (WHO, 2013)

more males ($n = 133$, 51.2%) than females ($n = 127$, 48.8%). Of the 260 patients, 141 (54.2%) were urban dwellers. Nearly all the study participants had secondary ($n = 96$, 36.9%) or tertiary ($n = 115$, 44.2%) education. Also, 127 (48.8%) study participants were employed, and 59 (46.5%) earned between ten thousand to fifty thousand Naira monthly.

Oral health findings on intraoral examination of study participants

The oral health status of the study participants is shown in Tables 2 and 3. It was represented using the GI, OHI-S, and DMFT indices, three basic indices for measuring oral diseases. Increased deposits of dental plaque were seen in those with PD ($n = 153$, 61.9%) and those with NPD

($n = 94$, 38.1%). Dental calculus was observed in most of the participants with PD ($n = 140$, 63.9%) and in those with NPD ($n = 79$, 36.1%) ($p = 0.001$).

The majority of the study participants in both groups had mild gingivitis, with 64.2% observed in those with PD and 35.8% in those with NPD ($p = 0.000$). Some study participants with PD ($n = 68$, 69.4%) had poor oral hygiene, as opposed to those with NPD, with the majority ($n = 37$, 37.0%) having fair oral hygiene ($p = 0.005$). Findings showed that most patients had a DMFT score of 0, as seen in those with PD ($n = 97$, 58.8%) and NPD ($n = 68$, 41.2%) ($p = 0.902$). Both groups of patients with mental disorders had a low mean DMFT of 1.0 ± 1.07 for the PD group and 1.0 ± 0.9 for the NPD group.

Oral hygiene behaviors and related social history of the study participants

Table 4 highlights the study participants' oral hygiene practices and related social history. The toothbrush was used by 219 study participants: 130 (59.4%) participants with PD and 89 (40.6%) participants with NPD had toothbrushes as their sole tooth cleansing material. While 17 (63.0%) patients with PD and 10 (37.0%) patients with NPD made use of both toothbrushes and chewing sticks, 8(57.1%) patients with PD and 6 (42.9%) with NPD used chewing sticks only. Most patients with PD ($n = 137$, 58.5%) and NPD ($n = 97$, 41.5%) reported once daily brushing. Only 10 (71.4%) patients with PD and 4 (28.6%) patients with NPD were assisted or supervised during brushing. Majority of the study participants with PD ($n = 125$, 61.9%) and NPD ($n = 77$, 38.1%) consume cariogenic diet. Most of the participants, both those with PD ($n = 149$, 59.1%) and NPD ($n = 103$, 40.9%),

Table 4 Oral hygiene behaviors and related social history of the study participants

| Variables | PD (n = 155) No. (%) | NPD (n = 105) No. (%) | χ^2 (p-value) |
|--|-------------------------|--------------------------|-----------------------|
| Do you brush yourself? | | | 0.8577 (0.354) |
| Yes | 145(58.9) | 101(41.1) | |
| No | 10(71.4) | 4(28.6) | |
| What do you use to brush? | | | 0.1395 (0.920) |
| Toothbrush | 130(59.4) | 89(40.6) | |
| Chewing stick | 8(57.1) | 6(42.9) | |
| Toothbrush and chewing stick | 17(63.0) | 10(37.0) | |
| How many times do you brush daily | | | 1.114 (0.227) |
| Once a day | 137(58.5) | 97(41.5) | |
| Twice a day | 14(63.6) | 8(36.4) | |
| Every two days | 4(100.0) | 0(0.0) | |
| Do you drink alcohol? | | | 0.0037 (0.952) |
| Yes | 57(59.4) | 39(40.6) | |
| No | 98(59.8) | 66(40.2) | |
| Do you smoke cigarettes currently? | | | 0.8115 (0.368) |
| Yes | 6(75.0) | 2(25.0) | |
| No | 149(59.1) | 103(40.9) | |
| Do you take any cariogenic diet (sugary foods/snacks/medication/ carbonated drinks)? | | | 1.9309 (0.165) |
| Yes | 125(61.9) | 77(38.1) | |
| No | 30(51.7) | 28(48.3) | |

did not have the habit of smoking cigarettes at the time of the study. Similarly, many of them with PD ($n = 98$, 59.8%) and NPD ($n = 66$, 40.2%) did not consume alcohol.

Discussion

Our study evaluated the oral health of outpatients with mental health disorders by comparing two groups: those with psychotic disorders (PD) and those with non-psychotic disorders (NPD). The results showed a low mean DMFT in both groups, likely attributed to their emphasis on self-care, especially oral hygiene, as most participants reported brushing at least once daily, with many doing so independently. This finding contrasts with Hert et al.'s research, which indicated that individuals with mental health disorders often struggle with self-care abilities, as well as the mental acuity and manual dexterity required for oral hygiene maintenance. Our results may also differ from those of Hert et al. because our participants possibly had less severe mental health issues.

The lower rate of dental caries found in our study among both groups may be related to more regular toothbrush use with dentifrice and reduced alcohol and tobacco consumption, as the latter significantly increases the risk of dental caries [18]. The role of family, especially the extended family unit in the African context, cannot be ignored as studies have pointed to this traditional role of family members sharing responsibilities as community caregivers [19].

The higher literacy levels in the population, with many achieving secondary or tertiary education, likely enhance their recognition of the importance of basic oral health

care. The low mean DMFT score aligns with findings from lower and middle-income countries, such as a mean DMFT score of 2.3 reported in Southwestern Nigeria by Adeniyi et al., 1.92 in Ethiopia by Kebede et al., and 2.1 in India by Singh et al.

Most patients with PD exhibited poorer oral hygiene than those with NPD, who mostly had better oral hygiene. This difference may be linked to the antipsychotic medications that PD patients take, which can reduce saliva production, thereby worsening their oral health [20]. Mild gingivitis was prevalent among most patients, likely due to infrequent brushing (once daily), which contributed to increased dental plaque and calculus.

Most respondents belonged to a low-income bracket, earning about a dollar a day, below the World Bank international poverty line of 2.15 USD per day per person [21]. This low income would hinder access to quality dental care for preventive or restorative treatments. This finding aligns with McKibbin et al.'s study, which indicated that many individuals with mental illness faced challenges such as lack of employment, financial buoyancy, and difficulties accessing healthcare, including dental services.

Limitations

Information regarding recent hospital admissions, the duration of stay as inpatients, and the frequency of relapses of the mental illness were not obtained. Any correlation between the oral hygiene of the participants and the years of diagnosis or duration of use of medications was not represented, as this information was inconsistent among respondents. The inability to use a dental mirror

and probe due to the necessity to enhance infection control while minimizing costs for the researchers may have resulted in missing some incipient carious lesions. However, the examination and recording of findings by two different investigators with similar results shows the reliability of the study results, coupled with strict adherence to the research protocol.

Conclusion

The oral health status of outpatients with mental disorders was assessed through the lens of the interviewer and the patients, and the findings demonstrate low caries experience and poor oral hygiene in these patients, with a higher prevalence in patients with psychotic disorders than those with non-psychotic disorders. Basic routine intraoral examination and oral health assessment of this group of patients at intervals is recommended. Psychiatrists, psychiatric nurses and other mental health personnel should be educated on how to perform these basic examinations with appropriate referral to a specialist dentist, in addition to patient and caregiver counselling on the importance of good oral hygiene practices.

Abbreviations

| | |
|-------|---|
| PWMD | People with mental disorders |
| PD | Psychotic disorder |
| NPD | Non-psychotic disorder |
| DMFT | Decayed, Missing, and Filled Teeth |
| CPI | Community Periodontal Index |
| OHI-S | Oral Hygiene Index Simplified |
| GI | Gingival Index |
| OPMDs | Out-patients with mental disorders |
| FNHE | Federal Neuropsychiatric Hospital Enugu |

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12903-025-05636-9>.

Supplementary Material 1

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Author contributions

NEU: was involved in the conception of research ideas, study design, data collection, analysis, and interpretation, and was a major contributor to writing the manuscript. NBN: played a key role in the conception of research ideas, literature review, data collection, analysis and interpretation, and contributed to writing the manuscript. NIN: was involved in conceiving research ideas, methodology, data collection, analysis and interpretation, and contributed to writing the manuscript. ONK: was involved in the data interpretation and revision of the final manuscript. AEA: played a role in the data interpretation and revision of the final manuscript. UNP: was involved in the study design, data analysis, data interpretation and revision of the final manuscript. All authors read and approved of the final manuscript.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study adhered to the Helsinki Declaration on medical research involving human participants. Ethical clearance was obtained from the Health Research Ethics Committee through the head of Ethics and Research, Federal Neuropsychiatric Hospital Enugu (FNHE). The ethical clearance reference number was FNHE/HTR/REA/VOL.11/067. The purpose of the study was explained to each patient, after which a signed informed consent form was obtained. For minors (under 18 years of age), consent was obtained from their parents or legal guardians. Legally authorized representatives of illiterate participants provided informed consent on their behalf. Illiterate participants who could not write were asked to do a thumbprint where consent was given in the presence of a witness, and the representative was also asked to sign beside the thumbprint. The researchers communicated with these participants in the local language so they could understand and feel comfortable enough to provide honest responses to the questionnaire. For adults with cognitive decline, their legal guardians provided informed consent on their behalf and were also involved in filling out the survey questionnaire based on the participants' responses.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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