Original Article

Dental pain and oral health-related quality of life of patients attending a Nigerian tertiary hospital - a cross-sectional study

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Abstract

Background: Poor oral health significantly compromises quality of life. While the link between oral conditions and Oral Health-Related Quality of Life (OHRQoL) is established, specific data on the impact of dental pain from various oral conditions in Nigerian patient populations is scarce. This study addresses that gap.

Aim: To assess the impact of dental pain on OHRQoL among patients at the University of Port Harcourt Teaching Hospital, Rivers State, Nigeria.

Methods: A descriptive, cross-sectional study conducted among patients attending the University of Port Harcourt Teaching Hospital (UPTH). Semi-structured questionnaires were used for data collection. The questionnaire had three sections. Section A included information on socio-demography, Section B on diagnosis and duration of dental pain, and Section C on the short form of the Oral Health Impact Profile questionnaire (OHIP-14) to evaluate the QHRQoL of dental pain among patients. Data were analysed using SPSS version 27.0, with statistical significance set at $p < 0.05$.

Results: There were 212 participants [66 (31.1%) males and 146 (68.9%) females]. 'Physical pain' was the most severely affected domain. Maxillofacial fractures (mean OHIP-14: 31.3 ± 13.8), pericoronitis (28.6 ± 10.9), and dental caries (27.5 ± 11.5) had the highest negative impact. Most participants with these conditions reported negative OHRQoL impact ($p <0.001$). Gingivitis had the least impact.

Conclusion: Dental pain, particularly from maxillofacial fractures, pericoronitis, and caries, greatly impairs OHRQoL. Hence, the need for targeted, prompt management of painful dental conditions to improve patient well-being and highlights the value of OHRQoL measures in clinical assessment.

Keywords: Dental pain, oral health, quality of life, OHIP-14, Nigeria

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INTRODUCTION

Oral health is an essential aspect of general health. [1] It is multidimensional in nature, including physical, psychological, emotional, and social domains that are fundamental to overall health and well-being.[2] The impact of oral health on quality of life has been reported in the literature. [3] Poor oral health has a significant influence on the quality of life and can adversely affect people's daily lives and well-being. It causes discomfort, pain, difficulty with eating and chewing, speech and aesthetic problems as well as social embarrassment. [4, 5]

The World Health Organisation (WHO) defined quality of life as "perceptions of

people's position in life in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns." [6] While the United States Surgeon General's report defined OHRQOL as "A multidimensional construct that reflects (among other things) people's comfort when eating, sleeping, and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health." [7] There has been an increasing emphasis on OHRQoL as it measures ill-health in terms of its origins and impacts, due to the limitations of disease-based measures of oral health state. OHRQoL is associated with functional, psychological, and social factors and experience of pain or discomfort. It is assessed using multiple-item questionnaires such as the Geriatric Oral Health Assessment Index (GOHAI), Oral Impact on Daily Performance (ODIP), European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire—Oral Supplement (EORTC QOQ OH-17), Chewing Function Questionnaire and Oral Health Impact Profile-14 (OHIP-14). [4, 8, 9]

The OHIP-14 is an ideal measure of patients' perceptions concerning their oral health. [10] It is considered a short, valid, reliable questionnaire, with adequate cross-cultural consistency and is sensitive to changes. [11] It is considered to be one of the most internationally spread OHRQoL indicators, available in several languages. OHIP- 14 enquires into oral impacts in seven dimensions: functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Participants respond on 5-point Likert scales according to the frequency of effects over a six-month reference period.[12]

Oral diseases such as caries, dental fluorosis, tooth loss, periodontal disease, dental injuries, oral cancer, dental anomalies, craniofacial disorders have a negative impact on oral health-related quality of life (OHRQoL). [13] In Nigeria, the association between sociodemographic factors, clinical dental conditions, oral health behaviors, and OHRQoL were investigated in children, [14] older adults, [15] and public workers. [16] However, there is a paucity in the literature of studies on the impact of dental pain caused by different dental conditions on oral health-related quality of life among Nigerian dental patients, especially in Port Harcourt, which represents a knowledge gap. Hence, this study aims to assess the effect of oral pain caused by different dental conditions on oral health-related quality of life among patients attending the dental clinic at the University of Port Harcourt Teaching Hospital.

METHODOLOGY

Study design and study setting

This was a descriptive, cross-sectional study conducted among patients who attended the Oral Diagnosis Clinic of the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt, Rivers State. The hospital is located about 15km away from Port Harcourt city, along the East-West Road in Obio/Akpor Local Government Area of Rivers State.

Ethical approval

Ethical approval was obtained from the Health Research and Ethics Committee of the Institution (UPTH/ADM/90/S.II/VOL.XI/1219), followed by participants' consent before commencement of the study.

Study participants

Participants were recruited using a convenience sampling method. The participants were patients with dental pain who attended the Oral Diagnosis Clinic, UPTH. Inclusion criteria included patients with dental pain who were present at the time of data collection, had clear consciousness, were able to make independent judgments and gave consent to participate in the study. Exclusion criteria were patients without dental pain and patients with dental pain who did not give consent to participate in the study, mental disorders or other serious illnesses.

Study size determination

With reference to a previous study, [17] the prevalence of patients whose periodontitis had an impact on their quality of life was 86.7%.

The formula $N = Z^2pq/d^2$ was utilised, and the minimum sample size calculated was 182. However, in this study, 212 questionnaires were retrieved and accurately filled out.

Data sources

Data were collected over 6 months (November 2024 to May 2025), using semi-structured, self-administered questionnaires. A total of 230 questionnaires were retrieved; 18 questionnaires were discarded because they were not completed accurately, and only 212 were accurately completed, resulting in a response rate of 92.2%. The questionnaire had three sections. Section A included information on socio-demography (age, gender, and educational status). Section B included information on the diagnosis and duration of dental pain. Section C included information on the short form (English version) of the Oral Health Impact Profile questionnaire (OHIP-14) to evaluate Oral Health Quality of Life of dental pain among patients. The OHIP-14 is composed of 14 items that assess seven different dimensions, evaluating their impact as dental pain on the perception of the individuals regarding their own quality of life. Each of the 14 OHIP items or questions has a set of possible answers distributed on a Likert scale (4 = very often, 3 = fairly often, 2 = occasionally, 1 = hardly ever, 0 = never), which represents the frequency that the individual perceives the impact of oral health on seven dimensions: functional limitation (evaluated by items 1 and 2), physical pain (evaluated by items 3 and 4), psychological discomfort (evaluated by items 5 and 6), physical disability (evaluated by items 7 and 8), psychological disability (evaluated by items 9 and 10), social disability (evaluated by items 11 and 12) and handicap (evaluated by items 13 and 14) [11] To calculate OHIP-14, total scores range from 0 to 56 calculated by summing the ordinal values for the 14 items. The higher the OHIP-14 scores, the worse the OHRQoL and the lower the OHIP scores, the better the OHRQoL.[12] For cross tabulation, the OHIP score was dichotomised as "OHIP = 0 (i.e. no impact: Never, hardly ever (0–14)) and OHIP =1 (i.e. impact on daily performance: occasionally, fairly often, very often (15–56)".

The periodontal health was assessed using the community periodontal index (CPI) with the aid of standardized CPITN-C probe and mouth mirror. Dental caries was assessed using the decayed, missing, and filled teeth index (DMFT) as recommended by the World Health Organisation. [18] Pericoronitis was diagnosed by the presence of an inflamed operculum covering an unerupted third molar. [19] Dentine hypersensitivity was assessed using Schiff's scale of sensitivity to cold air. [20] Maxillofacial fracture was diagnosed by the presence of a midfacial or mandibular fracture, verified through orthopantomography. [21]

The reliability of the instrument was assessed using 10 patients other than those recruited for the study. The reliability of the instruments was determined using Cronbach's alpha, and an alpha coefficient of 0.82 was obtained. Examination of oral conditions was done by two examiners, and the Cohen's kappa coefficient for inter-examiner variation was 0.84.

Statistical analysis

Statistical analysis was done using the Statistical Product and Service Solution (SPSS) version 27.0 (IBM SPSS Inc., Chicago, Illinois). Continuous variables were expressed as mean ± standard deviation. Categorical variables were presented as frequencies and percentages. Differences between groups were compared using the chi-square test or Fisher's exact test for categorical variables, p-value < 0.05 was considered statistically significant. Fisher's exact test was used in this study because some cells had expected frequencies less than 5, which makes the chi-square test inaccurate.

RESULTS

Sociodemographic characteristics of participants

There were 212 participants with an age range of 17 – 98 years and a mean age of 37.0 ± 15.8 years. There were 66 (31.1%) males and 146 (68.9%) females with M: F of 1:2.1. Most of the participants, 70 (33.0%), were in the 20-29 age group, and 138 (65.1%) participants had tertiary education.

Distribution of diagnoses for dental pain among participants

Figure 1 shows that 68 (32.1%), 59 (27.8%), 29 (13.7%) and 19 (8.9%) participants respectively presented with periodontitis, dental caries, pericoronitis and dentine hypersensitivity.

Distribution of responses to Oral Health Impact Profile (OHIP-14) among participants

Table 1 shows that the OHIP-14 domain with the highest mean value was physical pain (pain aching = 2.74 ± 1.20 and uncomfortable eating = 2.66 ± 1.33). Psychological discomfort had the next mean OHIP-14 score (self-consciousness = 2.14 ± 1.42 and felt tense = 1.87 ± 1.45). Functional limitation (difficulty pronouncing words = 0.59 ± 1.15 and loss of taste = 0.79 ± 1.22) had the lowest mean OHIP-14 score.

Impact of different dental pain diagnoses on the domains of the OHIP-14 scale

Table 2 shows that periodontitis had an impact on physical pain, psychological discomfort and physical disability OHIP-14 domains, with a mean OHIP-14 score ≥ 3.50 +2.58. Dental caries had an impact on physical pain, psychological discomfort, physical disability, psychological disability and social disability domains with mean OHIP-14 scores of ≥ 3.53 ± 2.12, while maxillofacial fractures had an impact on all the domains of OHIP-14 with mean OHIP-14 scores of ≥ 3.24 ± 1.42.

Relationship between diagnosis of dental pain and Oral Health Impact Profile (OHIP-14) scores among participants

Table 3 shows that participants who had maxillofacial fractures had the highest mean OHIP-14 score of 31.3 ± 13.8. Participants with pericoronitis and dental caries, respectively, had mean OHIP-14 scores of 28.6 ± 10.9 and 27.5 ± 11.5, while participants with periodontitis had a mean OHIP-14 score of 20.9 ± 12.6. The overall mean OHIP-14 score was 22.9 ± 12.7.

Gingivitis had no impact on the OHRQoL of 14 (66.7%) participants but had a negative impact on the OHRQoL of 7 (33.3%) participants. Periodontitis had no impact on the OHRQoL of 25 (36.8%) participants, but it had an impact on the OHRQoL of 43 (63.2%) participants. Dental caries had an impact on the OHRQoL of 50 (84.7%) participants, while maxillofacial fractures had an impact on the OHRQoL of 7 (100.0%) participants. This finding is statistically significant. ($p < 0.001$).

Sociodemographic distribution of Oral Health Impact Profile (OHIP-14) scores among participants

Table 4 shows that the oral conditions had no impact on 20 (30.3%) males, while they had a negative impact on 46 (69.7%) males. Among females, the oral conditions had a negative impact on 102 (69.7%). This finding is not statistically significant ($p = 0.981$). Considering the age group, the oral conditions had a negative impact on 58 (82.9%) participants within the 20 - 29 years age group and 13 (65.0%) participants within the 50 - 59 years age group. This finding is statistically significant ($p = 0.003$).

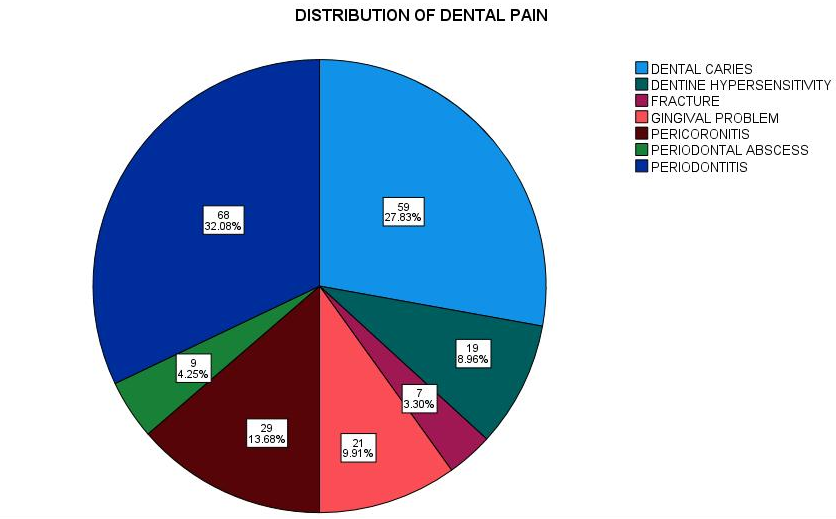

Figure 1: Distribution of diagnoses for dental pain among participants

Table 1: Distribution of responses to Oral Health Impact Profile (OHIP-14) among participants

	Responses N (%)					
	No Impact		Negative Impact			
OHIP-14 Domain and Questions	**Never**	**Hardly often**	**Occasionally**	**Fairly often**	**Very often**	**Mean ± SD**
Functional limitation:						
Difficulty pronouncing words	155 (73.1)	19 (9.0)	19 (9.0)	8 (3.8)	11 (5.2)	0.59 ± 1.15
Loss of taste	136 (64.2)	22 (10.4)	27 (12.7)	17 (8.0)	10 (4.7)	0.79 ± 1.22
Physical pain:						
Painful aching	17 (8.0)	5 (2.4)	70 (33.0)	44 (20.8)	76 (35.8)	2.74 ± 1.20
Uncomfortable eating	25 (11.8)	13 (6.1)	47 (22.2)	51 (24.1)	76 (35.8)	2.66 ± 1.33
Psychological discomfort:						
Self-consciousness	41 (19.3)	29 (13.7)	50 (23.6)	43 (20.3)	49 (23.1)	2.14 ± 1.42
Felt tense	56 (26.4)	30 (14.2)	51 (24.1)	35 (16.5)	40 (18.9)	1.87 ± 1.45
Physical disability:						
Unsatisfactory diet	49 (23.1)	24 (11.3)	53 (25.0)	45 (21.2)	41 (19.3)	2.02 ± 1.43
Interruption of meals	49 (23.1)	21 (9.9)	61 (28.8)	42 (19.8)	39 (18.4)	2.00 ± 1.40
Psychological disability:						
Lack of relaxation	48 (22.6)	28 (13.2)	58 (27.4)	31 (14.6)	47 (22.2)	2.00 ± 1.44
Embarrassed	89 (42.0)	40 (18.9)	43 (20.3)	22 (10.4)	18 (8.5)	1.25 ± 1.32
Social disability:						
Irritable with others	88 (41.5)	38 (17.9)	45 (21.2)	30 (14.2)	11 (5.2)	1.24 ± 1.27
Difficulty at work	80 (37.7)	31 (14.6)	50 (23.6)	28 (13.2)	23 (10.8)	1.45 ± 1.39
Handicap:						
Less satisfied with life	111 (52.4)	32 (15.1)	34 (16.0)	18 (8.5)	17 (8.0)	1.05 ± 1.32
Unable to function	105 (49.5)	33 (15.6)	39 (18.4)	18 (8.5)	17 (18.0)	1.10 ± 1.32

Table 2: Impact of different dental pain diagnoses on domains of the OHIP-14 scale

Diagnoses of dental pain	Domains of OHIP-14 Mean ±SD						
	Functional limitation	Physical pain	Psychological discomfort	Physical disability	Psychological disability	Social disability	Handicap
Periodontitis	1.48 ± 2.22	4.85 ± 2.13	3.75 ± 2.41	3.50 ± 2.58	1.49 ± 2.22	2.46 ± 2.38	1.91 ± 2.27
Dental caries	1.58 ± 2.09	6.15 ± 1.76	4.59 ± 2.49	4.81 ± 2.51	3.86 ± 2.41	3.53 ± 2.12	2.98 ± 2.66
Dental hypersensitivity	0.26 ± 0.65	5.32 ± 2.06	3.37 ± 2.39	3.74 ± 2.56	2.42 ± 2.69	1.47 ± 1.95	1.21 ± 1.27
Maxillofacial fractures	3.24 ± 1.42	7.57 ± 0.79	4.86 ± 3.02	4.57 ± 2.44	3.86 ± 2.12	4.00 ± 2.72	3.28 ± 2.82
Gingivitis	0.86 ± 1.42	3.48 ± 2.20	1.95 ± 2.11	2.19 ± 2.42	1.33 ± 1.881	1.24 ± 1.89	0.76 ± 1.26
Pericoronitis	1.79 ± 1.98	6.03 ± 2.03	5.41 ± 2.58	5.24 ± 2.23	4.34 ± 2.18	3.24 ± 2.34	2.55 ± 2.61
Periodontal abscess	0.33 ± 0.71	5.56 ± 2.13	3.22 ± 1.99	3.44 ± 2.24	0.33 ± 0.71	2.33 ± 2.35	1.44 ± 1.94

Table 3: Relationship between the diagnoses of dental pain and Oral Health Impact Profile-14 scores among participants

Diagnosis of dental pain	Mean OHIP-14 score (mean ± SD)	OHIP-14 score N (%)		P value
		No impact: Never, hardly ever (0 - 14)	Negative impact: occasionally, fairly often, very often (15 - 56)	
Periodontitis	20.9 ± 12.6	25 (36.8)	43 (63.2)	< **0.001***
Dental caries	27.5 ± 11.5	9 (15.3)	50 (84.7)	
Dentine hypersensitivity	17.8 ± 11.4	10 (52.6)	9 (47.4)	
Maxillary/mandibular fracture	31.3 ± 13.8	0 (0.0)	7 (100.0)	
Gingivitis	11.8 ± 10.6	14 (66.7)	7 (33.3)	
Pericoronitis	28.6 ± 10.9	3 (10.3)	26 (89.7)	
Periodontal abscess	19.3 ± 8.5	3 (33.3)	6 (66.7)	

***Significant**

Table 4: Sociodemographic distribution of Oral Health Impact Profile (OHIP-14) scores among participants

Variables		OHIP-14 SCORE N (%)		P value
		No impact: Never, hardly ever (0 - 14)	Negative Impact: Occasionally, fairly often, very often (15 - 56)	
Gender	Male	20 (30.3)	46 (69.7)	0.981
	Female	44 (30.1)	102 (69.7)	
Age group (in years)	< 20	4 (20.0)	16 (80.0)	**0.003***#
	20 – 29	12 (17.1)	58 (82.9)	
	30 – 39	15 (36.6)	26 (63.4)	
	40 – 49	12 (35.3)	22 (64.7)	
	50 – 59	7 (35.0)	13 (65.0)	
	60 – 69	13 (59.1)	9 (40.9)	
	≥70	1 (20.0)	4 (80.0)	
Educational status	Informal	1(33.3)	2 (66.7)	0.255#
	Primary	1 (12.5)	7 (87.5)	
	Secondary	16 (25.4)	47 (74.6)	
	Tertiary	46 (33.3)	92 (66.7)	

***Significant #Fisher exact**

DISCUSSION

Oral diseases have a negative impact on oral health-related quality of life (OHRQoL).[13] In this study, the two most common dental diseases were periodontitis and dental caries, both caused by the accumulation of bacteria in dental plaque. [22] This finding is in tandem with reports in the literature. [23, 24]

The oral health-related quality of life (OHRQoL) was assessed using the OHIP-14, which is a reliable measure of individuals' perceptions regarding their own oral health and their expectations from treatments and services. [11] In this study, the domain with the highest mean OHIP-14 score was painful aching and uncomfortable eating. This finding is in concordance with results from previous studies conducted among dental patients.[17, 25] However, this finding is contrary to the findings from a previous study, where self-consciousness (psychological impact) was the highest impact.[16] The difference may be because the present study was conducted among participants with dental pain, and pain is a grave concern of patients with oral conditions and is the predominant reason for dental clinic visits, [26] while the study by Aikins et al [16] was conducted among healthy participants.

The mean OHIP-14 score of the participants was 22.9 ± 12.7, which indicates a high impact on the oral health-related quality of life of the participants. This finding is higher than the mean OHIP-14 from previous studies. [17, 25] The differences could be because of the type of oral conditions assessed and the OHIP scaling method used; the study by Lawal et al [17] assessed participants with dental caries and periodontitis only, while the present study assessed participants with dental caries, periodontitis and other oral conditions such as maxillofacial fracture and pericoronitis, etc. The study by An et al [25] used the OHIP-5 scale, while the present study used the OHIP-14 scale. Participants who presented with maxillofacial fractures had the highest mean OHIP-14 scores and had an impact on all the domains of the OHIP-14. This finding is in tandem with those from other studies, where maxillofacial fractures were reported to negatively impact all domains of the OHIP-14

scale, having both short and long-term impacts on the patients, also the patients needed psychological assessment for improvement of their OHRQoL.[27, 28] In this study, participants with pericoronitis had a higher mean OHIP-14 score after maxillofacial fracture. This may be because pericoronitis, which is often associated with partially erupted and impacted third molars, [29] can lead to pericoronal abscess, peritonsillar abscess, limited mouth opening and Ludwig's angina, which could result in airway compromise requiring emergency hospital treatment. These symptoms reduce the individual's quality of daily life. [30] This finding was validated in this study, as pericoronitis had an impact on all domains of the OHIP-14 scale except functional limitation and handicap.

Dental caries was reported to affect the physical limitation and psychological discomfort domains of the OHIP-14, hence decreasing the quality of life of patients. [25, 31, 32] This report aligns with the findings in this study, as dental caries had an impact on physical pain, psychological discomfort, physical disability, psychological disability and social disability. Regarding participants with periodontal disease, the mean OHIP-14 score was highest in those with periodontitis, then decreased in periodontal abscess, dentine hypersensitivity, with the lowest score in participants with gingivitis. Furthermore, periodontitis had an impact on psychological discomfort and physical pain. This finding follows the trend in previous studies, where periodontitis was reported to affect the functional, physical, and psychological domains.[33, 34] Gingivitis only had an impact on physical pain, which indicates that gingivitis had less impact on OHRQoL compared to other oral conditions.

Concerning the relationship between the diagnoses of dental pain and Oral Health Impact Profile-14 scores among participants, all the oral conditions except gingivitis had higher negative impact on the participants; this finding is statistically significant. This reiterates the importance of oral health as a vital component of general health and its consequences on public health.

Regarding the relationship between sociodemographic with the OHIP-14 score, there was a greater negative impact on females compared to males; however, this finding was not statistically significant. This finding follows the trends of previous studies. [16,17.25] However, there was a statistically significant association between the age groups and the OHIP-14 score. This finding is contrary to the findings from previous studies, [16, 25] where there were no statistically significant relationships between the age groups and the OHIP-14 score. This may be because of the difference in age grouping in the studies. There was no statistically significant association between educational status and OHIP-14 score; this finding aligns with previous studies. [16, 25]

This study is not without limitations; these include that it was a cross-sectional study, which prevents causal inferences. Convenience sampling was used, which limits generalizability. The data were self-reported, which has potential for recall and social desirability bias. Furthermore, the sample was limited to individuals attending a single tertiary hospital in Nigeria, which may have introduced selection bias and limited the generalizability of the findings to other populations. However, to the best of our knowledge, this is the first study to assess oral health-related quality of life among dental patients who presented in the dental clinic with pain from diverse oral conditions in the south-south region of Nigeria.

Recommendations

A longitudinal study is recommended to compare the pre- and post-treatment OHIP-14 scores for oral conditions. Also, a multicentre study is recommended to compare OHIP-14 scores among dental patients across various hospitals.

CONCLUSION

The overall-mean OHIP-14 score for the participants was 22.9 ± 12.7. Maxillofacial fractures, pericoronitis and dental caries, respectively, had higher negative impact on

the quality of life of the participants. There was a statistically significant association between the oral conditions and OHIP-14 scores (p = < 0.001).

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Conflict of Interest:

There are no conflicts of interest.

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