

Awareness and Disposition towards the Clinical Use of Distraction Virtual Reality among Selected Dental Healthcare Workers in Benin-City, Nigeria

***Osazee K. ORHUE, **Owen S OMOROGBE, ***Edorisiagbon OSAYANDE**

**Department of Oral Diagnosis and Radiology (Family Dentistry), **Oral and Maxillofacial Surgery, University of Benin Teaching Hospital, Benin City, Edo State*

****Dental Centre, Central Hospital, Benin City, Edo State*

ABSTRACT

Objective: Dental fear has been demonstrated to be common and an unavoidable reaction that appears as a result of the various dental procedure and armamentarium induced stress. The extent of patients' experiences ranges from nervousness, anxiety to dental phobia, and it has been reported as a huge hinderance for a successful completion of dental procedure or treatment. Dental practitioners have several approaches to control anxiety and pain in patient, and one of the reported suitable technique adopted for the management of behavior and pain during dental procedure is the distraction virtual reality. Therefore, the present study sought to examine awareness and disposition towards the clinical use of distraction virtual reality among selected dental healthcare workers in Benin City, Nigeria.

Methods: This study adopted the survey research design. A total of 100 questionnaires were distributed among dentist and dental students in Benin City Metropolitan, however only 72 responses was received. Data were analyzed using descriptive statistics such as frequency and percentages. The result of the study revealed that a great proportion of the participants had an inadequate knowledge, as 56.9% of the participants reported that they have not heard about the use of distraction virtual reality in dentistry, and a similar trend of inadequacy was also observed for the responses on have you used the distraction virtual reality for patients, as 88.2% reported with a "No". As per the willingness to use distraction virtual reality in dentistry, the result revealed that the participants were willing to receive training on the use of distraction virtual reality (84.5%). Also, majority of the participants reported that distraction virtual reality should be incorporated in the curriculum of dental training.

Conclusion: Therefore, distraction virtual reality may be considered a good alternative in managing anxious patients in dental operatory and it is also a technique worth practicing in pediatric dentistry.

Correspondence

Dr. O.K. Orhue

Department of Oral Diagnosis and Radiology (Family Dentistry),
University of Benin Teaching Hospital,
Benin City, Edo State

Email: kelvinorhue@gmail.com

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INTRODUCTION

The human mind loathes pain and any form of discomfort, so it influences the usually aversive and uncooperative responses towards any event or procedure that portends to elicit these modalities; whether actual or perceived

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The consequence of this is the development of fear and

anxiety for such procedures that evoke pain. Hence the proper management of perceived pain in medical procedures will include the holistic management of the concept of fear, phobia and anxiety (Al-Khotani et al., 2016). Medical practitioners have therefore over the years sought different systems to help improve the level of patient's cooperation even during procedures that ordinarily might elicit physical and or psychological challenges as expressed from the mind's perception of pain and discomfort (Morley et al., 1999; Montgomery et al., 2000). Nonetheless a plethora of Psychological techniques have shown some promise (Morley et al., 1999; Montgomery et al., 2000). Distraction as a concept especially the use of Virtual reality in routine medical and especially dental procedures for this purpose continues to push the boundaries of pain control by "distracting the mind" (Botella et al., 2008).

Extensive body of scientific reports suggest that the aetiology of fear, anxiety or phobia which is the primary reason for patient's lack of cooperation or total avoidance of certain routine medical and dental procedures is complex and multifactorial (Botella et al., 2008; Boyle et al., 2009). In dental procedures for instance, dental anxiety, or dental fear, is estimated to affect approximately 36% of the population, with another 12% suffering from extreme dental fear. This anxiety can have serious implications in terms of an individual's overall oral health (Freeman, 1999; Eitner et al., 2006; Humphris et al., 2013).

In order to mitigate the anxiety experienced by patients either before or in the course of a procedure, the use of distraction virtual reality is encouraged. Distraction using Virtual Reality, patients are presented with a computer simulated, three-dimensional environment which along with multi-sensory and other cognitive stimulatory modalities such as sound, wide range of motion; "transmit" the patient to a virtual world. The patient typically wears a headgear which is fitted with enhancement gadgets depending (on the level of sophistication of the headgear) together with eyepieces (Botella et al., 2008; Aminabadi et al., 2012) (Figures 1 & 2). The patient is then taken through a preprogrammed path of an exciting fantasy and adventure. This technique of distraction presents the mind with a vivid cognitive task with converging sensory inputs which further diminishes its capacity to process other cognitive responses such as pain (McCaul and Malott, 1984). It has been found to be successful in managing pain and painful conditions in patients such as experimental pain (Hoffman et al., 2006; Patterson et al., 2006), chronic pruritus (Leibovici et al., 2009), port access and IV placement (Nilsson et al., 2009), burn injuries (Hoffman et al., 2008) as well as dental pain (Hoffman et al., 2001).

Additionally, virtual reality distraction technique has shown great promise in ameliorating dental pain and improving of patient behaviour. It has also been reported to be one of the most exciting and evolving dental clinical protocols (Furman et al., 2009). A study by Hoffman et al. (2001), showed a remarkable improvement in pain management using visual analogue scale as instrument of measurement (Hoffman et al., 2001). Aminabaldi et al. (2012) showed a significant improvement in pain and anxiety control in children undergoing dental treatment using Screen for Child Anxiety Related Disorders (SCARED) and Faces version of the Modified Child Dental Anxiety Scale (MCDAS). Although from the foregoing it is evident that the use of virtual reality distraction technique as a treatment modality has found increasing application in dental patient management around the world. In Nigeria, there is paucity of report on the use, acceptability and applicability of virtual reality distraction as an option for behavioral modification as well as in enhancing patients' clinical experience. Therefore, the present study sought to examine the awareness and disposition towards the clinical use of distraction virtual reality among selected dental healthcare workers in Benin City, Nigeria.

MATERIALS AND METHODS

Research Design

This study adopted the survey research design whereby the entire population of the study were sampled through the administration of the questionnaire to the selected research participants of the total population. This design was considered appropriate because it can easily be used to reach a large population very cheaply.

Population of the Study

The population of this study comprised of Dental students of the University of Benin, Dentists practicing in the University of Benin Teaching Hospital (UBTH), Central Hospital Benin and private Dental clinics in Benin City. The study targeted a total population of two hundred. It is from this population that the sample size was drawn for the study.

Sample Size

The sample size of this study was one hundred (100). The sample population was drawn from three categories or study areas using the random sampling technique, the categories include; University of Benin Teaching Hospital (UBTH), Central Hospital Benin City and private Dental clinics in Benin City. This is because the selected categories cover all Dentists in Benin City.

Method of Data Analysis

The data collected was statistically analyzed using IBM SPSS version 22.0 for descriptive statistics.



Figure 1: Oculus quest virtual reality head mounted display.



Figure 2: Visual reality headset in use.

RESULTS

The result of this study as presented in Table 1 revealed that from the sample population of 72, male constituted 76.4% of the participants. Registrars were the highest in number with 50%, followed by house officers (34.7%).

A large proportion (56.9%) of the participants reported that they have not heard about the use of distraction virtual reality in dentistry while 29.2% of the participants demonstrated an adequate knowledge by responding with a "Yes" to the question. Responses to the question, have you ever used distraction virtual reality for a patient? 88.2% responded with 'No'. for the responses based on experience, majority of the participants (62.5%) rated the patient experience during the procedure as good which is the highest ranked. A similar trend was also observed for responses on the following research questions; Did you feel that the use of distraction virtual reality made your work less tedious? 60% of the participants stated 'Yes' while 20%

of the participants stated 'No'. Do you feel that distraction virtual reality improved patient's clinic experience? 60.9% of the participants reported with 'Yes' while 31.3% of the participants reported with 'I don't know' (Table 3).

Responses on the willingness to use distraction virtual reality in dentistry was also analyzed and the findings presented in Table 3. The result revealed that 84.5% of the participants demonstrated an interest in further exposition on the use of distraction virtual reality in dentistry through seminars and training. Responses to the research question on "do you feel that distraction virtual reality should be incorporated in the curriculum of dental training?", 86.4% of the participants reported "Yes" while 13.6% reported "No". Also, responses were also gathered for the research question "Do you feel that the use of distraction virtual reality will be welcomed by patients and dental practitioners?", and the result revealed that 55.2% of the participants reported with a "Yes", 3% "No" and 41.8% were unsure.

Table 1: Gender and designation of the respondents

Characteristics	Frequency (n)	Percent (%)
Gender		
Male	55	76.4
Female	17	23.6
Designation		
Dental Student	10	13.9
House Officer	25	34.7
Medical Officer	1	1.4
Residents	36	50%

Table 2: Awareness on the use of distraction virtual reality in dentistry among the respondents

Variables	Frequency(n)	Percent (%)
Have you heard about the use of distraction virtual reality in dentistry?		
Yes	21	29.2
No	41	56.9
Not Sure	10	13.9
Have you ever used Distraction Virtual Reality for a patient?		
Yes	8	11.8
No	60	88.2
How would you rate the patients experience during the procedure?		
Good	5	62.5
Not so good	2	25.0
Indifferent	1	12.5
Did you feel that the use of distraction virtual reality made your work less tedious?		
Yes	9	60.0
No	3	20.0
It's hard to say	3	20.0
Do you feel that distraction virtual reality improved patient's clinic experience?		
Yes	39	60.9
No	2	3.1
Not Sure	3	4.7
I don't know	20	31.3

Table 3: Willingness to use distraction virtual reality in dentistry among the respondents

Variables	Frequency (n)	Percent (%)
Would you like to attend a seminar or a training on the use of distraction virtual reality in dentistry?		
Yes	60	84.5
Am not sure	4	5.6
only if it is sponsored	5	7.0
If it is convenient	2	2.8
Do you feel that distraction virtual reality should be incorporated in the curriculum of dental training?		
Yes	51	86.4
No	8	13.6
Do you feel that the use of distraction virtual reality will be welcomed by patient and dental practitioners?		
Yes	37	55.2
No	2	3.0
Not sure	28	41.8

DISCUSSION

Dental fear has been demonstrated to be common and an unavoidable reaction that appears as a result of the various dental procedure and armamentarium induced stress. The extent of patients' experiences ranges from nervousness, anxiety to dental phobia, and it has been reported as a huge hinderance for a successful completion of dental procedure or treatment (Udoeye et al., 2005; Shah & Bhatia, 2018). Dental practitioners have several approaches to control anxiety and pain in patient, and one of the reported suitable technique adopted for the management of behavior and pain during dental procedure is the distraction virtual reality (Naser et al., 2012; Wiederhold & Wiederhold, 2012). Virtual reality (VR) has extensively been reported as an excellent tool to distract the patients mental processing and as a result lessening the level of pain consciously experienced by the patient (Hoffman et al., 2000; Wiederhold et al., 2014). It is to this backdrop that this study examined the level of awareness and disposition towards the use of distraction virtual reality among dentist and dental student in Benin City, Nigeria.

The responses of the participants were expressed in percentage, and the result (table 1) revealed that from the sample population of seventy-two, a large proportion of the participants were male with 76.4% relative to the female with 23.6%. The result indicates that there are higher number of male dentist and dental students in Benin City. Although, there is no existing national report in Nigeria showing gender distribution in the dental profession. However, a study conducted in the United States, revealed that the participation of female in health profession was on the increase in recent times though only 31% of dentist are female (Surdu et al., 2021). As per the designation of the participants, the residents and house officers were dominant with 50% and 34.7% respectively. Apparently, the dominate category of the participating

dentist is best suited for this study owing to their years of experience.

Going forward, the study examined the level of awareness on the use of distraction virtual reality in dentistry and the finding were in Table 2. It was observed that a great proportion of the participants had an inadequate knowledge, as 56.9% of the participants reported that they have not heard about the use of distraction virtual reality in dentistry. The similar trend of inadequacy was also observed for the responses on have you used the distraction virtual reality for patients, as 88.2% reported with a "No" while only 11.8% revealed that they have used the approach in the dental practice even though the majority of the participants were senior dentist and of course with reasonable years of experience in the field of dentistry. The observable inadequate knowledge on the use VR in dental practice corresponds to the report of Udoeye et al. (2005). The authors agreed that poor awareness may be a contributing factor (Udoeye et al., 2005). A greater proportion of the participants rated the patient's experience during the procedure as good with and also revealed that they feel that distraction virtual reality improved patient's clinic experience. In the same light, most of the participants reported that they feel that the use of distraction virtual reality made their work less tedious. The result of the study agrees to fact that a key yearning for dental professionals is to treat their patient in an anxiety-free situation end to end with providing the best dental care (Udoeye et al., 2005; Shah & Bhatia, 2018). To achieve this, it has become very necessary for dentists to develop and implement learned skills in behavioral management procedure such as distraction virtual reality particularly in Nigeria. Additionally, the study also examined the willingness to use distraction virtual reality in dentistry. The result revealed that the participants were willing to receive training on the use of distraction virtual reality (84.5%). As per if distraction virtual reality should be

incorporated in the curriculum of dental training, majority of the participants reported with a yes. Presently, distraction is an integral part of the pain management course in the nursing curriculum of many Nigerian universities (Ibitoye & Oyewale, 2019). Based on the responses of the participants, the existing incorporation of distraction in the nursing curriculum in Nigeria (Ibitoye & Oyewale, 2019), and the reported benefits of VR (Udoeye et al., 2005; tenBerg, 2008; Shah and Bhatia, 2018; Maryo & Chayati, 2021), it is imperative to incorporate of distraction virtual reality into the dental training curriculum.

A significant number of the participants felt that distraction virtual reality would be welcomed by patients and dental practitioners. This may be related to the fact that distraction technique is a non-aversive behavior management procedure. It is extensively used and recognized globally because it is simple, safe as well as effective in ameliorating pain and disruptive behavior in patients during the invasive dental procedures (Peretz & Gluck, 1999; Shah & Bhatia, 2018).

CONCLUSION

The result of this study revealed an inadequate level of knowledge and experience on the use of distraction virtual reality among the studied dental healthcare workers. However, there was a high level of interest in training on the use of distraction virtual reality for dental practice as well an agreement for incorporation of distraction virtual reality into the dental training curriculum in Nigeria. Therefore, distraction virtual reality may be considered, a good alternative in managing anxious patients in dental operatory and it is also a technique worth practicing in pediatric dentistry. While the researchers are confident that the analyzed data has provided baseline information on awareness disposition towards the clinical use of distraction virtual reality, the peculiarities of the period of this study (COVID-19 lockdown), absence of representation of all cadres of the dental profession and limited geographical spread can be addressed in further studies.

Source of support

None

Conflict of Interest

None

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