VR-Based Relaxation Therapy for Customer Service Staff: A Pilot Study

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Abstract. Customer service staff are the frontliners of any organisation. They act as the first stop centre for customer or client to report complaints or feedback. However, this job also comes with a stressful working condition. For this reason, XperionVR™, a Virtual Reality-based relaxation therapy system was developed with the intention of providing easy access for employees to manage their stress by practising relaxation techniques. This paper describes the evaluation of XperionVR™ conducted among the staff of a customer service unit of a large utility company. This pilot study aims to gather participants' perception of the effectiveness of each element in the therapy component of the VR-based relaxation therapy system in helping them to relax or reduce their stress level. The procedure involves participants going through the therapy session, and feedback on the experience was gathered using questionnaire, direct observation, and interview. Forty participants had voluntarily participated in the pilot study. Based on the result of the analysis, it could be observed that most participants felt that the system managed to make them feel more relaxed and reduce their stress level. However, two challenges observed were i) due to the nature of customer service staff who only have short break time, it is important for any VR-based relaxation therapy system to be designed with the ability to provide optimal therapy outcome within a short period of time and ii) the system should consist of a feature that can provide a quick demonstration for users with no experience of using a virtual reality system on how to navigate the system. Without the demonstration, users will have difficulty using the system, which in turn, will cause adverse effect to the overall therapy experience.

Keywords: VR-based relaxation therapy · VR-based therapy · VR-based stress therapy · Stress and workplace · Organisation wellbeing

1 Introduction

The stress level of individuals working in an organisation has become an important issue in organisational wellbeing. Many studies reported that excessive work stress causes

negative impacts on individuals' mental and physical health as well as their wellbeing. A report released in 2019 by AIA Vitality as result of a survey conducted to understand how the workplace can affect employees' health, which relates the health of employees to their performance and engagement at work shows that Malaysian employees, consisting of mainly the working adults are overworked, stressed, and led unhealthy lifestyles [1]. This unbalanced work-life routine has basically contributed to the increment of mental health problems. Based on the survey, it is reported that among the main cause of mental health issues suffered by Malaysian workforce is overwork stress. Additionally, it is also reported that 51% of the employees suffer from at least one dimension of work-related stress mainly due to personal financial problem, long working hours and workplace bullying.

Another survey published by Statista Research Department in June 2019 also reported that the percentage of respondents experiencing mental health issues in Malaysia within the age range of 18 to 24 is much higher than those who are 55 years old and above [2]. This result shows that young adults are likely to struggle and adapt themselves to Malaysia's demanding working culture. Most of Malaysian employee starts to enter the workforce at the age of 18 to 24 years old, depending on their education level. A high number of young adults experiencing mental health problems indicate an early sign of our unhealthy working culture or the decline in our current generation's ability to deal with issues at workplace. This survey also reported that respondents with earnings of at least seven thousand Ringgit Malaysia (RM7000) per month are more likely to experience mental health issues. It is assumed that people with higher salaries are more likely to deal with complicated issues, which requires urgent and accurate decision-making processes. The quick and precise decision required put more pressure on these individuals.

The above statistics show an alarming sign for our society to be more aware and concerned about mental health-related issues. Therefore, it is imperative to address these issues among the Malaysian population in general and specifically among the Malaysian workforce before it is too late. Many studies reported that excessive work stress causes negative impact on individuals' mental and physical health [3]. Consequently, work stress is observed to cause health problems like cardiovascular diseases [4], musculoskeletal pain [5], depression [6] and cancer [7]. It has also been identified that work stress among workers have negative implication on their work performance, including high rate of absenteeism [8], inefficient work performance, and decreased work performance and motivation [9].

A new method for relaxation therapy that leverages the strength of Virtual Reality (VR) in reducing stress levels is being proposed. The fully immersive technology-based VR devices enable users to feel the virtual environment realistically. The usage of the Head-Mounted Displays (HMD) offers a fully immersive virtual reality experience. In VR technology, the virtual environment responds to the user's actions. Once equipped with HMD, a user is virtually isolated from the real-world surroundings; which hence, will help users to stay focused on the therapy and yield a better therapy outcome. At the minimum, the solution is to help those experiencing mild to moderate levels of mental health-related issues. The solution is not to replace mental health experts or mental healthcare support systems but to complement these existing services. Many

studies on virtual reality technology in the field of psychology have yielded promising results, where its benefits outweigh its disadvantages [10, 11] There is a growing research supporting the efficacy of Virtual Reality based treatment for stress and anxiety [12, 13], including the use of VR based relaxation therapy in workplace [14–16]. However, studies to evaluate VR based relaxation therapy with participants coming from customer service unit in an organisation (other than the healthcare field) is quite limited.

Therefore, this paper presents a pilot study conducted on real users who work in a busy customer service unit of a large utility company. The objective of the study is to gather the participants' perceptions of the effectiveness of each element in the therapy component of the VR-based therapy system in helping them relax or reduce their stress level. Apart from the effectiveness of therapy outcome, the pilot study also aims to observe the proposed system setup in real working environment and the real user approach to the solution.

2 XperionVR™

Along with the idea of providing easy access for workers to manage their stress by practising relaxation techniques, the project team has developed a VR-based relaxation therapy system named XperionVR™. The development of the VR-based relaxation therapy system has started since 2018. Each of the components of the VR-based relaxation therapy system and the elements associated with the components were carefully designed based on literature and few iterations of prototype development-evaluation-refinement cycles. In each cycle, the prototype was evaluated by a group of users and further refinements were made in the next iteration cycle, either incorporating new elements or refining existing elements to address issues and shortcoming observed during the user evaluation stage. Our past works can be found from the following publications [17–21].

XperionVR™ was designed to provide mental and emotional relaxation therapy for users while also helping them to regulate positive emotions within a minimal duration. Using stand-alone virtual reality head-mounted display (HMD), the application can be used by users anytime and anywhere. XperionVR™ provides two types of therapy scene option: 3D virtual environment and high quality 360° video. Each type of therapy scene option includes four types of audio: enchanting background music, soothing sound of nature, zikr and meditational recitative. The zikr provided were from a well-known Malaysian local artist, Hafiz Hamidun, while the writing of the meditational recitatives was supervised by a clinical psychologist. XperionVR™ also provide users with two language options: English and Bahasa Melayu. The 3D virtual environment scene option also includes relaxing games. The objective of the games is to distract the users from thinking about their problem for a while. However, the games are made optional since not all users would like to play games while going through the relaxation therapy. The duration of the therapy session for 3D environment scene and 360° video scene are 10 min and 5 min respectively. XperionVR™ also provides a before and after mind-framing session to the users. This mind-framing session is important as it prepares the mind of the users for the transitional stage, from the real world to the virtual world (mind-framing before the therapy session) and from the virtual world back to the real world (mind-framing at the end of the therapy session). During a therapy session, relevant

data were captured and submitted to the XperionVR™ database for analytics purposes. Figure 1 shows the snapshot of some of the 3D environments available in XperionVR™.

Fig. 1. Snapshots of 3D environments in XperionVR™

3   Procedure

The project team has conducted a pilot study to evaluate the effectiveness of XperionVR's system among the staff members of a customer service unit of a utility company. Since the utility company is a big corporation, the customer service unit is constantly busy with customer calls, putting the employees under constant pressure and stress. The customer service unit employees are usually given two 15 min break and a one-hour break during their work shift. The pilot study was carried out from 14th April until 5th May 2021. The original plan was to carry out the pilot study for three months. However, due to the rising cases of Covid-19, the unforeseen event of movement control order and further lockdown issued by the Government of Malaysia has halted the evaluation study.

This pilot study aimed to promote awareness of XperionVR™ system and gather feedback on the effectiveness of the system through surveys. More than forty (40) participants tried the system. However, only 40 participants answered the provided survey since not all users have the luxury of time to answer the survey due to insufficient break time and workload.

The system was placed in a small room dedicated to function as a 'therapy room' to avoid unnecessary interruptions (shown in Fig. 2). A 360° rotatable chair with wheel was provided to allow the participants to enjoy the 360° viewing experience while sitting on the chair. Participants were encouraged to sit during the therapy session to maximise the therapy outcome. However, the participants were also free to go through the therapy session while standing.

Participation in the survey were on voluntary basis. The participants were welcome to come to the therapy room at any time of the day. However, most of the participants visited the therapy room during their break time. Although instructions on how to use the system were provided in the therapy room, almost all participants did not read through the instruction. Instead, they preferred a quick demonstration to be given to them. To accommodate to this, our team member would provide a quick demonstration on how to use the VR controller and a brief explanation on how to navigate the system. The participants were then left to enjoy the therapy session by themselves. The session for

3D virtual environment option lasted for 10 min, while the 360° video option, lasted for 5 min. All participants completed the full session, i.e., none of them stop in the middle of viewing the session. Upon the completion of the therapy session, the participants were asked to fill in a set of questionnaires.

Fig. 2. Room setting for XperionVR™ pilot study

The questionnaire aimed to gather data on the usability and effectiveness of XperionVR™ as a relaxation tool. There were 15 questions included which consists of a combination of closed-ended and open-ended questions. However, there were also six questions on the selection preferences of participants on the system options, such as language preference, type of virtual environment, audio preference and type of games played, which will not be discussed in this paper. The rest of the questions aimed to gather participants' perception of the effectiveness of each element in the therapy component and the overall effectiveness of the solution in helping them to relax or reduce their stress level. Table 1 shows the questions included in the questionnaire pertaining the demographics and system effectiveness as well as its objectives.

Two methods used in analysing the gathered data were descriptive analysis and qualitative analysis. Descriptive analysis was used to analyse the collected data from the closed-ended questions, while the qualitative analysis method was utilised to interpret collected data from the open-ended question.

4   Results and Discussion

4.1   Demographics Information and Frequency of Use

This section describes demographics data and captures the frequency of use among the participants. Based on the analysis, 26 male (65%) and 14 female (35%) participated in this evaluation. Twenty-eight (28) participants (75.7%) were in the age range between 18 to 30 years old. Seven (7) participants (18.9%) were between the age range of 31 to 40 years old, and another 2 participants (5.4%) were between 41 to 50 years old. A question on the system usage frequency was also included in the questionnaire. Since the participants were free to use the system voluntarily, some participants used the system repeatedly during the three weeks of the evaluation period. Based on the analysis, 34 participants (85%) tried the system only once, while 6 participants (15%) tried the system more than once.

Table 1. Provided questions and objective of the questions

| No	Question	Objective
1	Gender	To identify the participant's gender
2	Age range	To identify the participant's age group
3	Frequency of using XperionVR™	To identify the participant's XperionVR™ usage frequency
4	The system is easy to use	To identify the usability of the system
5	The therapy session helps me to feel relaxed	To identify the effectiveness of the system as a relaxation tool
6	The audio helps me to feel relaxed	To identify the effectiveness of the audio provided as a mean to induce relaxation
7	The 3D environment/360° video helps me to feel relaxed	To identify the effectiveness of the environment provided as a mean to induce relaxation
8	The provided games help me to feel relaxed	To identify the effectiveness of the games provided as a mean to induce relaxation
9	Overall, I am satisfied with the whole experience provided by XperionVR™	To identify the user satisfaction level with the therapy session provided through XperionVR™
10	On a scale of 1–10, how would you rate your overall experience with XperionVR™	To identify the overall experience provided by XperionVR™

4.2   Results on System Effectiveness

This section provides an overview and summary of the analysis for the system effectiveness questions. For each question, participants were asked to rate the answers using a 10-point Likert scale; 1 (Strongly disagree) to 10 (Strongly agree).

Perceived Usability of the System. It was required for participants to rate the system's usability based on how easy it is to operate the system. Based on the analysis done, 34 (85%) of the participants has agreed that it is easy to use the system (with the usability rating between 8 to 10). The result indicates that the system is easy to be used as a relaxation tool. Figure 3 shows the rating on the perceived usability of the system.

Perceived Effectiveness of the System as a Relaxation Alternative. The effectiveness of the system was rated based on how effective the system has assisted the participants in achieving their tranquil state. The analysis shows that most of the participants (33 or 82.5%) agreed that the system is effective in assisting them in the relaxation process (with an effectiveness rating of 8 to 10). The result indicates that the system is effective as a relaxation alternative. Figure 4 illustrated the perceived effectiveness level of the system.

Perceived Effectiveness of the Audio Selections Provided in Inducing Relaxation. The system is equipped with four types of audios which are nature, zikr, meditation and
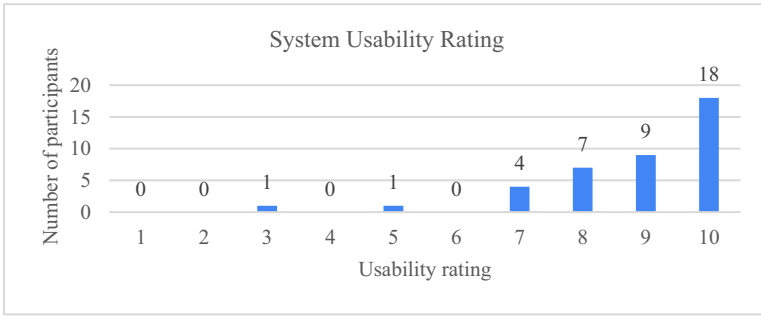
Fig. 3. Rating on the perceived usability of XperionVR™ for relaxation purposes
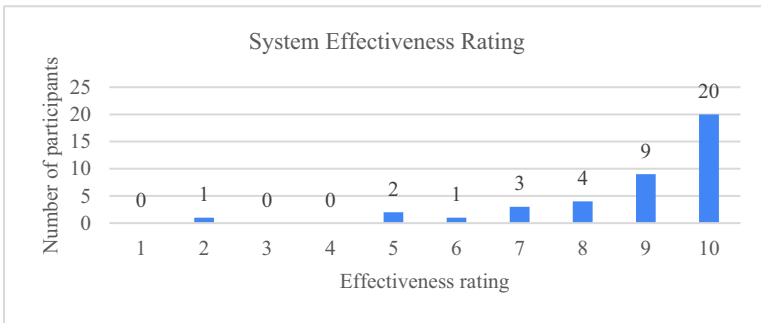
Fig. 4. Rating on the perceived effectiveness of XperionVR™ as a relaxation alternative

instrumental. The participants were free to choose their preferred audio for the therapy session. Therefore, to identify the effectiveness of the audio provided, the participants were required to rate on how helpful the audio in assisting them to relax. The result of the analysis shows that the audios included in the system are effective in inducing relaxation (30 participants or 75% with an effectiveness rating between 8 to 10). However, since many of the participants only used the system once, they might have accidently chosen unsuitable audio for their therapy session, which lead to some of them feeling that the audio was not as helpful in assisting them to relax. Figure 5 shows the rating on the perceived effectiveness of the audio.

Perceived Effectiveness on Environment Selections Provided in Inducing Relaxation. The system is equipped with two types of environments; 3D environment and 360° video. Each type has seven and six options, respectively. The participants were asked to rate the effectiveness of the environment in inducing relaxation. The analysis shows that the environment selections included in the system are effective in aiding the relaxation process (33 participants or 82.5% with an effectiveness rating between 8 to 10). However, there were one participant who rated 1 (strongly disagree) and 4 (somewhat disagree). The reasons given during the interview was that the person who rated 1 mentioned that he did not like the 3D cartoony look of the environment and prefer 360° video instead. Another person who rated 4 indicated that she felt a bit dizzy since it was
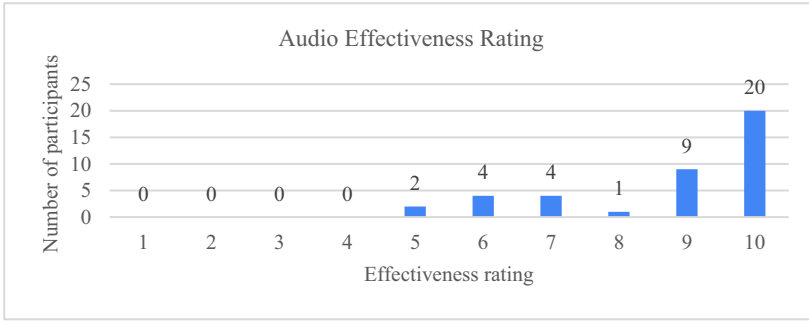
Fig. 5. Rating on the perceived effectiveness of audio selections in inducing relaxation

her first experience trying virtual reality application. Figure 6 illustrates the perceived effectiveness level of the system.
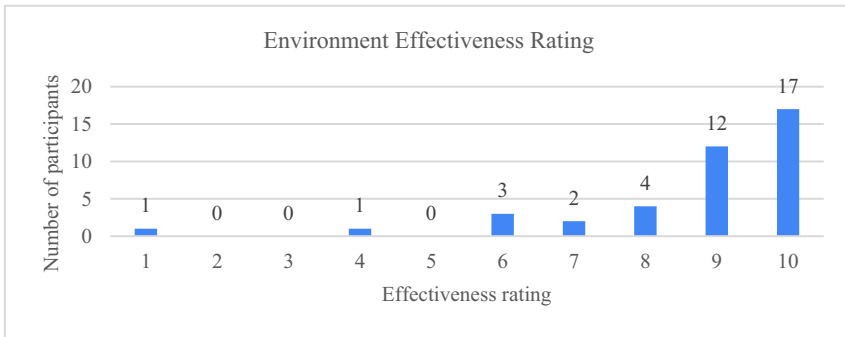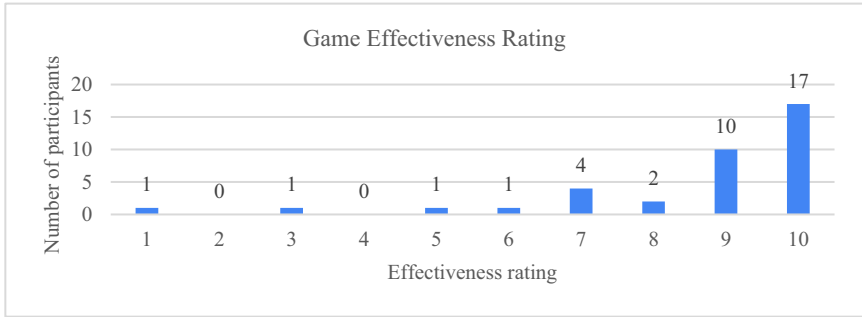

Fig. 6. Rating on the perceived effectiveness of environment selections in inducing relaxation.

Perceived Effectiveness of the Game Selections Provided in Inducing Relaxation. XperionVR™ offers several games to the users as an alternative interaction in the relaxation process. The participants were required to rate how useful the games were in assisting them to feel relax. The rating was used to identify the effectiveness of the games in aiding the relaxation process. However, there were three participants who did not give any rating to the question which may be due to the reason that they did not play any of the games. Despite that, the analysis shows that the game selections included in the system are effective in assisting the relaxation process with 29 of them give a high rate (with an effectiveness rating of 8 to 10). Figure 7 shows the rating on the perceived effectiveness of the game's selections.

User Satisfaction. The user satisfaction on the system is rated based on a 10-points Likert scale; 1 (Strongly disagree) to 10 (Strongly agree). The participants were required to rate the system based on how satisfied they feel with the system performance in assisting them to relax. Based on the analysis, the result shows that 34 (85%) participants

Fig. 7. Rating on the perceived effectiveness of games selections in inducing relaxation

were delighted with the performance of the system (with a satisfaction rating of 8 to 10). Figure 8 illustrates the perceived users' satisfaction level of the system.


Fig. 8. Rating on users' satisfaction towards XperionVR

User Overall Experience. The participants were requested to rate their overall experience with XperionVR™. The rating is based on a 10-points Likert scale; 1 (Worst) to 10 (Best). The analysis result shows that most of the participants (34 or 85%) had a good experience using the system (with an overall experience rating of 8 to 10). Figure 9 shows the rating for the overall users' experience with XperionVR™.

Based on the results, it can be concluded that the therapy experience provided by XperionVR™ is capable of assisting its users in achieving a relaxation state or reducing the stress level the users experienced before they undergo the therapy session. From 40 participants who had participated in this study, six participants (15%) have repeated the therapy session, indicating that the system is somehow useful to them, especially in assisting them to feel relaxed.

4.3 Participants' Feedbacks on the XperionVR System

The participants may provide any feedback, suggestions, and comments on their experience with XperionVR on the last question in the survey. The responses have been
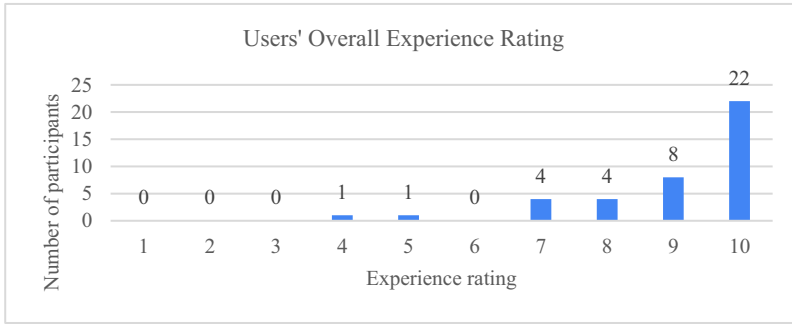
Fig. 9. Rating for the overall users' experience with XperionVR

categorised into two; positive feedback and feedback for improvements. Eighteen (18) participants provided positive feedback, which directly shows that the system has successfully assisted them in the stress reduction and relaxation process. Among the feedbacks received that shows the good impact of the system on the participants were: *"it's a good trail for stress relieve"*, *"interesting and exciting"*, *"good idea"*, *"good. I like it. It may change mood for a while. Definitely helping"*, *"it was really relaxing and kinda (kind of) nice. Appreciating this effort and I'm doing this for my second time"*, *"good experience"*, *"helping a lot"*, and *"I'm trying this for my 3rd time and it's nice for relaxation. This time I've tried to select new 360 mode. The 360 mode is realistic"*.

Six participants provided suggestions for future improvement. Among the suggestions received were: *"can be improved – use video instead of animation"*, *"feel dizzy since this is my first time using the system. Guide not clear. Can be improved"*, *"improve the visual to be more real next time"*, and *"the 360 mode is realistic and would suggest if there is some movement can be done means would be better"*.

4.4 Observation Notes

Based on the observations made during the pilot test, several feedbacks on the system were received either through observing participants' actions or by interview. Generally, the spontaneous actions and comments received during or after the therapy session show that the participants were generally satisfied and happy with the system that acts as a relaxation alternative. Among the good feedback received were:

a. VR-based relaxation therapy is a good initiative since before this, the users need to go to other places like the nearby park to relax their minds.
b. The meditation audio is effective partly due to the voice of the actor used in the system, which most participants find as 'lovely'.
c. The immersive environments make the users feel that they are physically in it.
d. The games make users feeling excited.

Despite that, there were also a few negative aspects in terms of a technical and controlled environment that needed to be improved and should be considered for future enhancement. Among the observed comments were:

a. A chair without a headrest made the participants feel uncomfortable since they are not sitting in a comfortable position due to being unable to rest their heads while experiencing the therapy.
b. The HMD model used feels quite heavy when users wear it, especially when they tilt their heads.
c. Several first-time users are clueless on how to press enter, scroll and drag using the controller since they are new to VR technology, requiring some demonstration to be done before they use the system.

Another observation found is that for staff working in a customer service unit, their break time is limited and hence, they need to be able to utilise their break time effectively. For this reason, in order to make any VR-based relaxation therapy useful to the staff of any customer service unit, it is important to develop a system capable of delivering therapy outcomes within a short time. It was also observed that the first timers did not really know what to expect with VR. Some of them just sat still and looked straight ahead. Our team will observe the participants's behaviour, and in the case where participants behaved as such, the team members will gently inform them that they can turn their head, look around and even rotate the chair to enjoy the 360° viewing experience. Once they realised the effect of 360 viewing experience, most of the participants will start turning their head to look around, rotating the chair (because they are sitting so that rotating the chair will have the same effect as if they turn around full body) and even standing up to play the game. Some of the first-time users and those who were not familiar with virtual reality applications also tend to spend a considerable amount of time getting themselves familiar with how to use the VR controllers instead of enjoying the therapy session. However, once they got a grasp on how to use the controllers, they enjoyed the therapy experience. This scenario is something that every VR designer need to think about when designing VR application. A feature to offer a short training session on how to navigate or experience the virtual environment might be helpful. However, this feature must be made optional since users who are already familiar with VR would want to skip going through the training session.

The decision to place the therapy system in a dedicated therapy room seems to be a correct decision. The participants can truly enjoy the session without being interrupted. With the therapy room being located outside of their workspace area, the participants had the chance to take a break from the place which had caused them to be in a stressful state. By being away from their workspace area, their break time are not interrupted by friends or immediate manager, but instead, they get to enjoy an exclusive 'me time' by themselves. A few of the participants also asked for the door of the therapy room to be closed for privacy. This observation is important to suggest how the system should be set up in the real working environment.

5   Conclusion

Overall, this pilot study has successfully fulfilled the objective of getting feedback on the effectiveness of the solution as an alternative relaxation tool from the participants. Forty (40) participants have participated in the survey. Based on the results, most of

the participants gave a high value rating on the usability and effectiveness of the system, user satisfaction level and user overall experience, indicating that the participants felt that the VR-based relaxation therapy has helped them to relax to a certain extent. The results suggested that VR-based relaxation therapy has the potential to be used as an alternative tool for stress management and relaxation for employee working under stressful condition, such as customer service unit.

However, the study had some limitation. Due to the limited time available for the participants, the survey can only be conducted very briefly to give the users more time to experience the therapy session. Hence, the questions that we asked only revolved around the usability and the effectiveness of the system in terms of helping the users to relax. It would be more helpful if questions on their stress level before and after using the system are also administered. For future evaluation, these items will be included in the evaluation procedure. Future plans include having the evaluation of VR-based therapy system effectiveness with different type of frontliners, such as those serving the customer directly (face-to-face encounter), general office worker, and different target group like the resident of senior home care. Additionally, the plan would also include conducting an evaluation on users who would be using the application repeatedly on a regular basis, in order to study the long-term effect of VR-based relaxation therapy to users.

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