

A Virtual Reality Relaxation Intervention on NCAA Division-One Student Athletes

Mika Liu^{1*} and David Matsumura MD²

¹Stanford University, Palo Alto, CA, USA

²Cedars-Sinai Medical Center, Los Angeles, CA USA

*Corresponding Author: Mika Liu, Stanford University, Palo Alto, CA, USA.

Received: May 17, 2019; Published: June 13, 2019

Abstract

National Collegiate Athletic Association (NCAA) Division One student athletes experience high levels of stress and overwhelming demands on their time but can experience barriers to receiving proper mental health care due to stigma and lack of time for mental wellness practices. The current study investigates the participant response to a virtual reality (VR) relaxation intervention - WORLDS by IFGworld™ - for student athletes, with the goal of assessing the potential use of Virtual reality relaxation as a mental wellness solution for student athletes. Forty NCAA Division-One student athletes from a school participated in this study by using the VR and completing a follow-up questionnaire including a survey designed for the study and a modified EORTC Quality of Life Questionnaire-C30. The results showed that the intervention was well received by the participants, with most about 75% reporting feeling relaxed and 90% reporting that they would use it again. About ten percent of participants experienced motion sickness in the VR environments, which is slightly lower than normal for first-time users. Further research should be done to evaluate the potential for VR as a time efficient and accessible tool for mental wellness among student athletes.

Keywords: *Virtual Reality; Student Athletes; Mental Wellness; Relaxation; Stress*

Going to college is a formative and positive experience for many, but it is one that is notoriously demanding on students' time and energy. Staying on top of grades, extracurriculars and a social life can feel like a juggling act for the most prepared students, and yet there is an entire swath of the college-going population who have an additional burden on their shoulders: student athletes. With hours of training each day and games on weekends, student athletes are often especially strapped for time, providing limited recovery for physical or mental energy compared to their non-athlete classmates. Due to these constraints and the immense burden of success both in the classroom and on the field, student athletes are a population potentially particularly susceptible to certain mental health issues.

According to a 2016 report by the NCAA, college athletes report devoting around 30 hours per week to their athletic commitments, an increase of approximately two hours since 2010, and only slightly fewer hours than the approximately 35 hours a week student athletes devoted to school [1]. Another study by Pritchard (2005) has also found that student athletes are more likely to experience stress from lack of sleep and time management issues due to their increased responsibility to their athletic team [2]. Recognizing the dangers that student athletes might face, the NCAA Sports Science Institute (SSI) was created, in part, to address some of these issues, stating on their website: "We strive to improve access to quality mental healthcare with the goal of creating a culture where care seeking for mental health issues is as normative as care seeking for physical injuries" p. 1 [3].

As a result of these time constraints and the added stress of their sport, student athletes' mental health can suffer. The 2016 NCAA report found that approximately one third of athletes stated that they had trouble finding the energy to complete other daily activities due to the physical demands of their sport, while about one quarter of the athletes reported being exhausted by the mental demands of their sport [1]. The NCAA also reports that incidence of mental health problems are increasing in student athletes, which mirrors similar increases in the general population [1]. A study by Wolanin, *et al.* (2016) found that in their sample of 465 student athletes, nearly one quarter showed signs of clinically relevant depressive symptoms [4].

Despite the added demands on their time, energy and bodies, student athletes can have increased barriers to mental health services as outlined by Watson (2003) [5]. Watson argues that both internal barriers to treatment, such as the tendency for athletes to favor resiliency and a win at all cost mentality or increased social stigma for athletes who are well-known on campus, as well as external barriers to treatment such as athletic commitments which interfere with students' ability to use their time to seek out help [5]. Given time constraints, the stigma of seeking mental health services, and the need to appear flawless that student-athletes might feel as a result of being well-known on their campuses, there exists a need for mental health services that are easily accessible, not too time consuming, and somewhat private in nature in order to encourage more student athletes to prioritize their mental health. In response to the prevalence of mental health problems among athletes and the barriers to obtaining treatment, the NCAA has recognized the need to further research and to understand mental health in student athletes, and has recently published a best practices document through the SSI, with the goal of encouraging athletic institutions to proactively combat mental illness among their athletes according to the standards that they outline, as opposed to the current, non-standardized mental health care that student athletes often receive [6].

A new field of research on virtual reality (VR) might hold the potential to create a new form of mental wellness practice for student athletes and to mitigate some of the barriers to mental health services that student-athletes face. Using immersive, virtual environments as a form of therapy has shown promising results in treating a variety of mental health issues from post-traumatic stress disorder to social anxiety. Distraction techniques in the form of music, relaxation and imagery have been used to effectively decrease anxiety and increase relaxation in past studies [7] and VR could be used as an enhanced version of these previously utilized techniques. Additionally, many clinical studies have shown VR to be helpful in relaxing patients who are going through stressful medical procedures. For example, a study by Schneider, *et al.* (2003) on older women undergoing chemotherapy treatment has shown that virtual reality was effective at reducing treatment related anxiety in the participant sample [8].

Similar to patients going through stressful procedures such as chemotherapy or surgery, student athletes experience periods of time that are particularly stressful, such as finals week or weekends with particularly important games or tournaments. Given the barriers to receiving mental health care that student athletes face, virtual reality treatments could provide a helpful and effective alternative during these stressful periods. The immersive and interactive nature of VR makes it a particularly interesting case study for the proposed goal of being an alternative way to improve these student athletes' mental wellness during times of stress. VR does not have the stigma associated with it that traditional mental health care has, it can be used in private without anyone seeing or hearing what the user is doing, and it is becoming ever more portable and affordable as it enters the mainstream. VR also does not require a clinician or an appointment, which could make it a feasible option for mental wellness that student athletes with major time constraints could take advantage of, not as a replacement to traditional therapy, but as an additional, self-initiated mental wellness routine. The current study investigates the potential for virtual relaxation environments to improve mental well-being in student athletes with a self-report questionnaire, with the goal of understanding the perceived reduction in anxiety that the WORLDS relaxation environments induced, as well as the overall response to the environments as a relaxation and mental wellness option.

Methods

Participants

Forty Division 1 student athletes participated in this study. Participation was voluntary. Participants ranged from 18 to 25 years of age.

Materials

WORLDS Virtual Reality environments created for relaxation and mental wellness by IFGworld™ (Los Angeles, CA) were used for the study. The environments included both indoor and outdoor settings such as a beach, a bamboo forest, an artist’s loft and a teahouse. The environments were administered with Oculus Go virtual reality headsets.

The follow-up questionnaire included a survey created for the purposes of this study about participants’ perceived relaxation and their general response to the VR experience, as well as a modified version of the EORTC Quality of Life Questionnaire (QLQ) C30 to determine participants’ mood while they were using the device.

Procedure

After volunteering to participate and giving their consent, all participants were instructed on how to operate the controls of the virtual reality headset and navigate within the different environments. All participants wore the headset (five to fifteen minutes), depending on their preference. They could choose from any of the 9 virtual environments and could switch between the different environments at will. After taking off the headset, all participants were given as much time as they needed to fill out the follow-up questionnaire in private. Confidentiality of the participants were ensured in that all participants filled out individual surveys.

Results

The main finding from the follow-up survey was in answer to the question “Did this help you relax or reduce any anxiety you might have had?” Of the 39 out of 40 participants who responded, 25.6% (10 participants) responded “No” and 74.4% (29 participants) responded “Yes” (See figure 1). In answer to the question “Would you use this again?” 10% of participants (4 participants) responded “No” and 90% (36 participants) responded “Yes” (See figure 2).

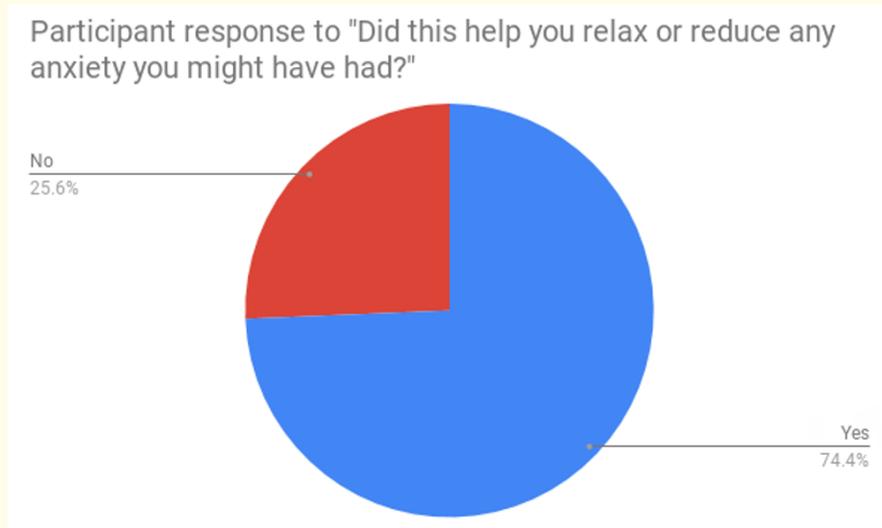


Figure 1

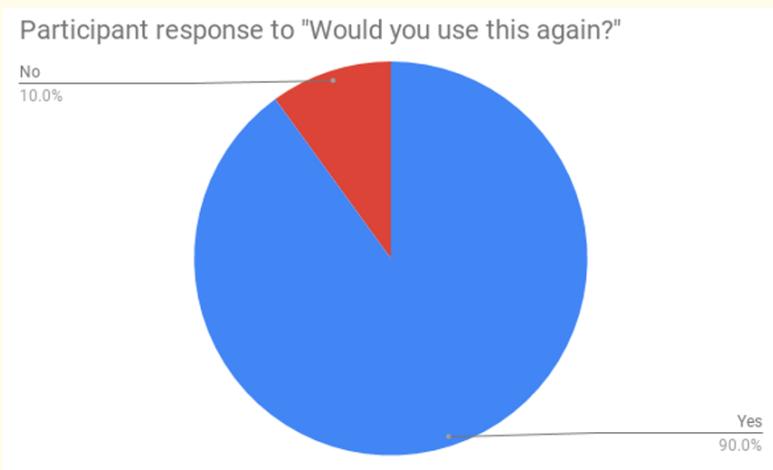


Figure 2

Only seven participants, or 17.5% of the sample, had previously used wellness apps, while 32 participants, or 80% of the sample, had not. Of the participants who had not used wellness apps, 17.2% (five participants) did not find the VR relaxing, while 83.8% (24 participants) did find it relaxing. Of the participants who had used wellness apps before, 20% (2 participants) did not find the VR relaxing, while 80% (8 participants) did find it relaxing. These results show similar levels of relaxation across those who had and had not used wellness apps previously. The wellness app results are illustrated in figure 3.

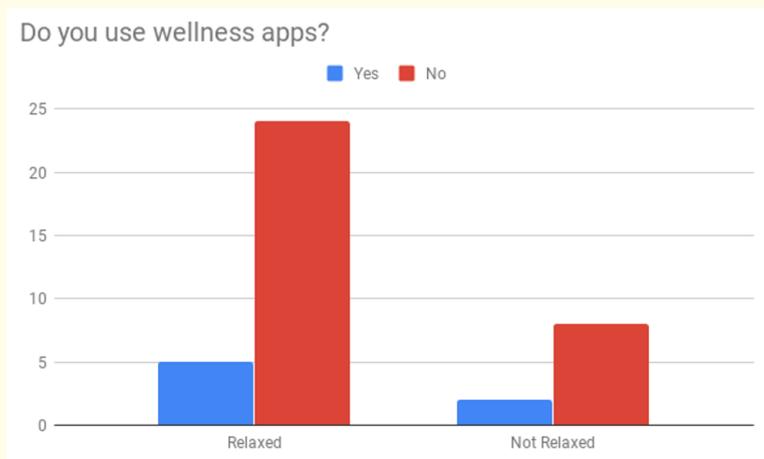


Figure 3

When asked, "Do you think IFGworld™ VR would be helpful in relaxing you before athletic competitions to perform better?" 10 participants or 25% of the sample responded "No," while 27 participants or 67.5% of the sample responded "Yes." The answers to this question are illustrated in figure 4. Additionally, participants responded similarly to this question whether or not they reported already having a pre-competition routine. Of the 17 participants who do have a pre-competition routine, 13 (76.5%) reported that the VR would help them perform better, while 4 (23.5%) reported that it would not. Of the 20 participants who do not have a pre-competition routine, 14 (70%) reported that the VR would help them relax before competition, while 6 (30%) reported that it would not. See figure 5 for an illustration of the pre-competition routine results.

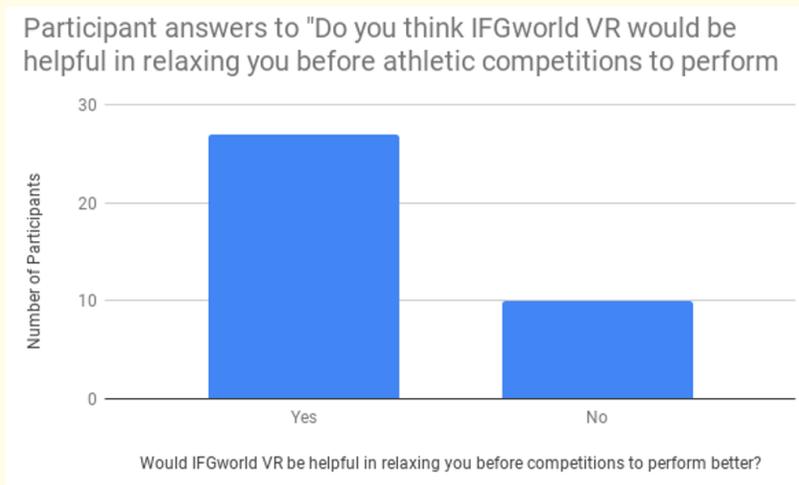


Figure 4

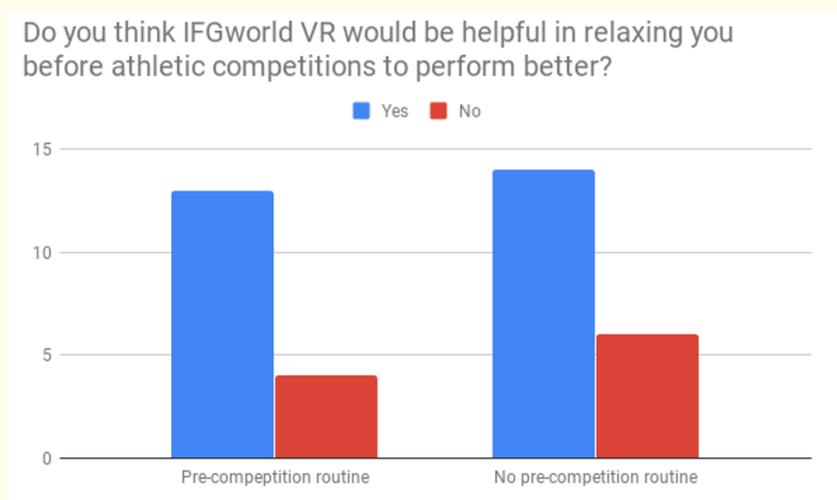


Figure 5

Lastly, we were interested in the prevalence of motion sickness in the participant sample, as it has been a reported side effect of virtual reality. In the current study, 5 participants (12.5% of the sample) reported feeling motion sickness while in the VR, while 33 (82.5% of the sample) reported no motion sickness (See figure 6). However, the percentage of participants who experienced motion sickness was similar across those who felt that the VR was relaxing and those who did not find it relaxing, although slightly more participants who experienced motion sickness reported that the VR was not relaxing compared with participants who did not experience motion sickness. Of the 27 participants who found the VR relaxing, 3 experienced motion sickness (11.1%) while 24 did not (88.9%). Of the 10 participants who did not find the VR relaxing, 2 participants (20%) experienced motion sickness, while 8 participants (80%) did not (See figure 7).

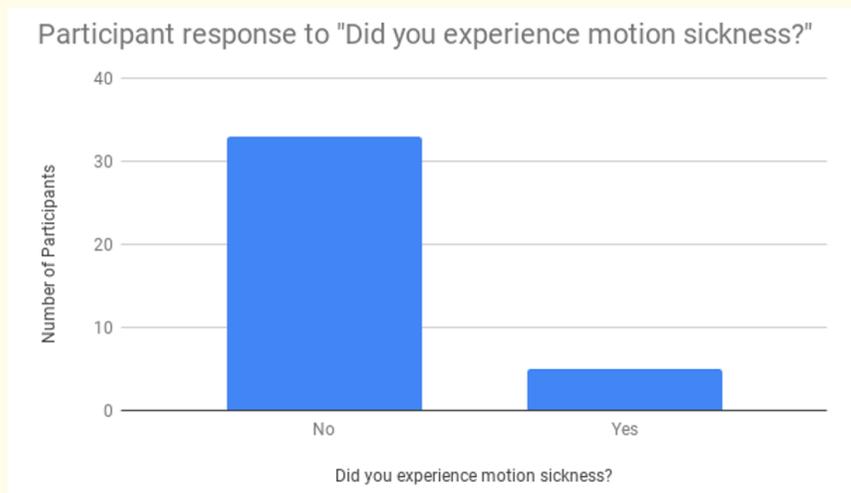


Figure 6

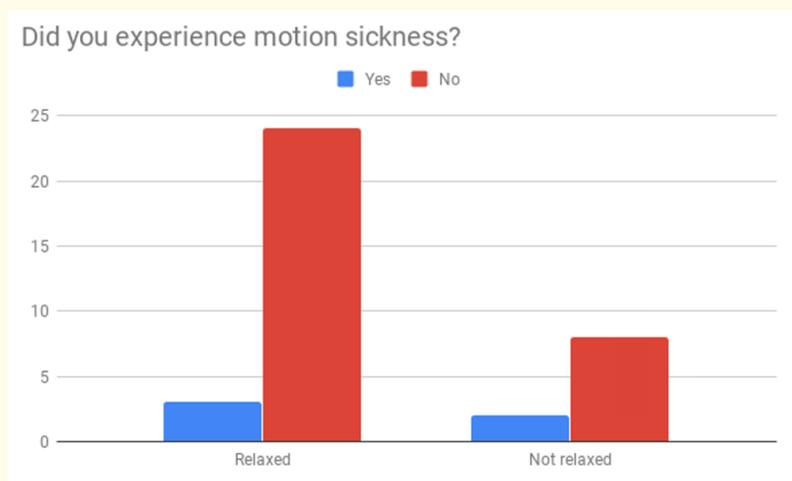


Figure 7

Discussion

Very limited data is available on VR as a tool to mitigate the stress of student athletes. In the current study we were primarily interested in whether the virtual reality intervention was relaxing to the student athletes who tried it. Our results show that most participants, about 75%, did find the VR relaxing, and that almost all of the participants said they would use the VR environments again. The positive response to the experience shows that VR could be a promising and desirable option for mental wellness in this population, and that student athletes are willing to experiment with it as a source of relaxation. To further understand these results we separated out the responses for people who had and had not previously used wellness apps to ensure that the positive response was not simply a reaction to a novel experience, and we found that the percentage of people who were relaxed by the device was similar across those who had and had not used mental wellness apps.

Additionally, most of the sample (70%) reported that they thought using IFGworld™ VR before a competition would help relax them and help them perform better. These results were similar (about 70% saying it would help them and about 25% saying it would not, with

some not responding) across participants who already have a pre-competition routine and participants who do not. These results were profound, surprising, and encouraging. The study was merely meant to examine the effects of IFGworld™ VR experiences on student athlete mental wellness and relaxation and not necessarily as a mindfulness/mental solution to help boost performance while on the field. The results show the significant positive effect of IFGworld™ VR on the student athletes' mental conditions as well as the importance of one's mental condition both on and off the field and as a pre-game mindset.

Lastly, we were interested in whether the participants experienced motion sickness, and whether that may have affected how relaxed they felt during the experience. We found that about a tenth of the sample experienced motion sickness, which is slightly lower than standard rates of first-time users of VR [9]. Although some of the participants who experienced motion sickness still reported feeling relaxed in the VR experience, a higher percentage of participants who did not report feeling relaxed also reported experiencing motion sickness, while fewer of those who were relaxed reported experiencing motion sickness. These results suggest that the motion sickness was not extreme, since some still felt that the VR was relaxing despite feeling sick, although the motion sickness may have contributed to the VR not being relaxing for some of the sample. These results indicate that future research and virtual reality technology development should focus on how to minimize the experience of motion sickness for users.

Although the sample selection may have suffered from some degree of convenience sampling in that the student athletes who participated were all voluntary participants from one NCAA Division One University, the results are still overwhelming positive and trending in the right direction for the hypothesis that relaxation-based VR can be used as an effective solution for student athletes for purposes of relaxation both in general and before competitions.

Conclusion

Overall the responses to the VR experience were positive, with most participants reporting feeling relaxed and that they'd use it again. Given the high prevalence of mental health problems in the student athlete population, as well as the recent efforts by the NCAA SSI to combat mental health issues and standardize care for these athletes, further research should be done on the potential for VR to be integrated into future efforts. Aside from the SSI, the Atlantic Coast Conference (ACC) has taken an effort to spearhead an inaugural Mental Health and Wellness Summit after the Washington State Quarterback, Tyler Hilinski died by suicide in 2018 Carter (2019) [10]. The ACC's commissioner, John Swofford, mentioned that student athletes are the conference's biggest and best assets and that the mental health summit is "more important than those national championships" p. 1 [10]. The ACC has made tremendous progress in providing mental health access for its athletes - "As of this year, every single campus in the ACC has some form of mental health service, whether it's a therapist, psychologist, sports psychologist," p. 1 [10] said Lennon, who recounted his own mental health challenges after he suffered injuries. "Every campus has at least one of those people that their student-athletes can have access to. And that's just a foundation of mental health services." p. 1 [10]. While the summit represents progress, it's only a starting point, and Swofford acknowledged that "[the summit is] something that'll have to be followed up on and dealt with day-to-day and invested in day-to-day in our campuses." p. 1 [10]. Clearly, there represents a need to address mental health issues head-on within the collegiate sports world, and VR can be seen as a way to bolster student athletes' mental well-being through its promising immersive nature. Specifically, future research should investigate the effects of a short-term and long-term VR relaxation routine on the mental well-being of student-athletes, as well as the particular aspects of the experience that are particularly effective. With 90% of the student athlete participants indicating they were interested in using IFGworld™ VR again, the future of VR for student athlete mental wellness interventions is promising.

Bibliography

1. National Collegiate Athletic Association. "NCAA GOALS study of the student-athlete experience: Initial summary of findings". NCAA.org (2016).
2. Pritchard M. "Comparing sources of stress in college student athletes and non-athletes". *Athletic Insight: The Online Journal of Sports Psychology* 5.1 (2005): 1-8.
3. "Mental Health". NCAA.org - The Official Site of the NCAA, National Collegiate Athletic Association.

4. Wolanin A., *et al.* "Prevalence of clinically elevated depressive symptoms in college athletes and differences by gender and sport". *British Journal of Sports Medicine* 50.3 (2016): 167-171.
5. Watson JC. "Overcoming the challenges of counseling college student athletes". ERIC Clearinghouse on Counseling and Student Services (2003).
6. NCAA Sport Science Institute, NCAA. "Mental Health Best Practices: Inter-Association Consensus Document: Best Practices for Understanding and Supporting Student-Athlete Mental Wellness". Indianapolis, IN: NCAA (2016).
7. Kolcaba K and Fox C. "The effects of guided imagery on comfort of women with early stage breast cancer undergoing radiation therapy". *Oncology Nursing Forum* 26.1 (1999): 67-72.
8. Schneider SM., *et al.* "Virtual reality intervention for older women with breast cancer". *CyberPsychology and Behavior* 6.3 (2003): 301-307.
9. Samit Jay. "A Possible Cure for Virtual Reality Motion Sickness". *Fortune* (2018).
10. Carter Andrew. "ACC seeks to bolster mental health treatment for athletes". *News Observer* (2019).

Volume 8 Issue 7 July 2019

© All rights reserved by Mika Liu and David Matsumura.