



# The Impact of a Mindfulness Application (App) on the Mental Health of Injured College Athletes Experiencing Chronic Pain



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## INTRODUCTION

- Some athletes may experience chronic pain after an injury, defined as pain that lasts beyond the normal timespan of healing over three months, not including tissue damage (Russo et al., 1998).
- Sport injuries have been found to impact athletes psychologically, including identity loss, decreased confidence, and increased anxiety or depression (Arvinen-Barrow & Walker, 2013).
- Most research on the psychological effects of sport injury has focused on acute injuries, yet approximately 42% of college athletes suffer chronic pain from injury (Shuer & Dietrich, 1997).
- Mindfulness is the ability to be fully present in a moment in time in one's body and pay attention to physical sensations and feelings (Kabat-Zinn, 1994).
- Mindfulness interventions have improved focus, awareness, stress, and performance in college athletes (Cosalupes et al., 2020; Vidic et al., 2017).
- Further, mindfulness applications (apps) have been found to positively impact injured athletes' mental health (Moesch et al., 2020). However, mindfulness apps have not yet been explored in injured athletes with chronic pain.

## PURPOSE

- To investigate if using a mindfulness application for 10 days can decrease perception of pain, symptoms of depression, and increase mindfulness in athletes with chronic injuries.

## METHODS

### Study Design

- Collegiate athletes experiencing chronic pain from a sport injury underwent a repeated measures design.

### Participants

- $N = 25$  (Male = 16, Female = 9) participants between 18 and 24 years of age.
- Participants competed in the following sports: track & field ( $n = 14$ ; 56%), football ( $n = 5$ ; 20%), baseball ( $n = 3$ ; 12%), powerlifting ( $n = 2$ ; 8%) and basketball ( $n = 1$ ; 4%).

### Procedures

- Following IRB approval, collegiate athletes meeting the below criteria were recruited to participate: suffer from chronic pain due to a sport-related injury; currently do not practice mindfulness; and had been cleared to play by their physician, athletic trainer, or both to participate in their sport.
- During the initial visit, participants completed a Demographic/Sport/Injury Questionnaire, Visual Analog Scale (VAS) to measure perception of pain, Beck Depression Inventory (BDI-II), and the Mindful Attention Awareness Scale (MAAS).
- Participants assigned to the experimental group then downloaded a mindfulness application to their phone and completed one mindfulness session on the app per day for the following 10 days.
- After 10 days, participants from both groups returned to the laboratory and completed the VAS, BDI-II, and MAAS a second time.

## METHODS, cont.

### Instrumentation

- Demographic/Sport/Injury Questionnaire created by the researchers.
- Visual Analog Scale questionnaire to measure perception of pain: least severe pain, most severe pain, and current pain (Hayes & Patterson, 1921).
- Beck Depression Inventory (BDI-II; Beck et al., 1996).
- Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003).
- Smiling Mind App created by Jane Martino and James Tutton.



Figure 1: Smiling Mind App Screenshot

### Statistical Analysis

- A two-way repeated measures ANOVA was conducted to assess differences in perception of pain, mindfulness, and depression symptoms over time between the two groups.
- An alpha level of 0.05 was used for indication of statistical significance.

## RESULTS

- The results revealed an overall significant effect in perception of current pain ( $F(1,23) = 6.4194, p = 0.019, \eta_p^2 = 0.218$ ).
- Likewise, a significant main effect on mindfulness was found ( $F(1,23) = 5.151, p = 0.033, \eta_p^2 = 0.183$ ).
- However, there were no significant differences between groups on depression symptoms ( $p = 0.143$ ), most severe pain ( $p = 0.416$ ), or least severe pain ( $p = 0.148$ ).
- See Table 1 for means and standard deviations.

Table 1: Variable Differences (mean  $\pm$  SD)

	Control Grp (Pre)	Control Grp (Post)	Exp Grp (Pre)	Exp Grp (Post)
MAAS	62.67 $\pm$ 12.61	60.75 $\pm$ 15.58	55.23 $\pm$ 13.58	61.38 $\pm$ 16.19
BDI-II	9.67 $\pm$ 5.91	7.67 $\pm$ 6.15	10.69 $\pm$ 6.26	5.62 $\pm$ 4.89
VAS (Most)	7.73 $\pm$ 1.00	7.25 $\pm$ 2.19	7.62 $\pm$ 1.00	6.42 $\pm$ 2.15
VAS (Least)	2.69 $\pm$ 1.31	2.94 $\pm$ 2.52	1.85 $\pm$ 1.14	1.15 $\pm$ 1.05
VAS (Current)	2.71 $\pm$ 2.65	2.63 $\pm$ 2.22	2.73 $\pm$ 1.70	1.02 $\pm$ 0.97

## DISCUSSION

- A decrease in perception of current pain and improvement in mindfulness were observed after participants participated in a 10-day mindfulness intervention. This supports existing research that found greater mindfulness scores in an intervention group correlated with reduced injury and improved performance (Zadeh et al., 2019). Likewise, a study on non-athlete middle-aged adults found a mindfulness app led to improvements in chronic pain management (Mascaro et al., 2021).
- No significant difference was observed in depression symptoms between the groups. However, both groups reported few depression symptoms, therefore the floor effect may be impacting these results.
- Further, no significant differences were identified between perception of most severe pain or perception of least severe pain. However, as participants reported their injuries occurring an average of 27 months ago, it's possible their most severe pain was experienced at or soon after their injury and will not be changed.
- Existing research on the effectiveness of mindfulness interventions and sport-related injuries has primarily focused on acute injuries rather than chronic (Naderi et al., 2020). The current study adds to the literature on mindfulness interventions and sport injury by exploring a brief 10-day mindfulness intervention using the app Smiling Mind in college athletes with chronic pain.

### Limitations and Future Directions

- External stressors such as academics, family, works, or relationships could have affected depression symptoms.
- Further minor injury during practices or time of the season may have affected pain scale measurements.
- Long-term effects of mindfulness interventions should be further explored with chronic pain due to sport-related injuries.
- Future research should also explore the impact of mindfulness interventions on collegiate athletes with chronic pain who report having high mental health issues, such as depression.

### Conclusions

- Our study determined that using the mindfulness app for 10 days produced a decrease in perception of current pain and increase in mindfulness compared to the control condition but did not appear to impact depression symptoms or perception of most or least severe pain.
- This suggests that a 10-day mindfulness app intervention can be utilized to decrease perception of current pain and improve mindfulness in collegiate athletes, thus improving their quality of life and athletic experience.

## REFERENCES

Scan here for references and contact information

