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The beneficial effects of a mindfulness programme on self-efficacy, emotion management and tennis performance

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ABSTRACT

This study aimed to test the effects of a mindfulness programme on self-efficacy and performance in the short game of ball-throwing, as well as anxiety and the ability to manage emotions in an official match. Sixteen male players (M = 22.4 years) of regional level, ranked between 30/1 and 15/3 (FFT), volunteered to participate in this study. They were randomly divided into 2 groups: Control and Mindfulness, they carried out 3 experimental phases: Pre-test (30 forehands and backhands with a ball launcher + tournament match), acquisition (6-week programme of mindfulness training or listening to music), and post-test (identical to the pre-test). Pre-competitive anxiety and self-efficacy scores, ball-throwing performance, and the number of positive and negative gestures and speeches during matches were recorded during the pre-and post-tests. The results of this study show that mindfulness training increases the feeling of self-efficacy and the performance of the ball thrower and reduces the number of negative gestures and speeches made by players in competition. Although the results of this experiment need to be confirmed, they show the value of developing tennis players' mindfulness skills.

Key words: mindfulness, tennis, competition, performance, self-talk.

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Tennis is a sport that involves hitting a ball, with a racket, to send it down the court once more than your opponent (Martin, 2018). According to Reid et al (2007), playing tennis requires technical, tactical, perceptive, physical, and mental skills. Whether in training or competition, players have to deal with problems of concentration, anxiety, or stress that can affect their performance (Daino et al., 2021). Therefore, it is important to find strategies for better managing stress, attentional resources, and emotions experienced during matches or training sessions (Crespo et al., 2006; Robin et al., 2023). The development and integration of mental skills and techniques into practice are now widely recognised as a key factor in sports performance (Foster & Chow, 2020; Mamassis & Doganis, 2004). Thus, the use of techniques such as mental imagery (Robin & Dominique, 2022), relaxation (Cece et al., 2020), self-talk (Robin et al., 2021) or mindfulness (Van de Braam & Aherne, 2016) is increasingly common among tennis players and coaches.

Mindfulness is a voluntary meditative practice that consists of being aware of the present moment without judgment (Kabat-Zinn, 2003). It involves three stages: lucidity (i.e. awareness of the thoughts or emotions of immediate experience), acceptance (i.e. a non-critical attitude towards the thoughts, emotions, or bodily sensations experienced), and refocusing

(i.e. refocusing on one's objective, strategy, or breathing). In a sporting context, mindfulness can help players improve their concentration and better manage their stress or emotions (Baltzell, 2016; Gardner & Moore, 2007). In addition, it could have an impact on the internal discourse verbalised aloud (Boudreault et al., 2016; Van Raalte et al., 2000) or the body language of players (Martínez-Gallego & Molina, 2019), which can influence performance (Martin, 2018). For example, the 'Mindfulness For Performance' (MFP; Fournier, 2021) programme has been specifically developed to improve sports performance and has shown positive effects in basketball and table tennis (Tebourski et al., 2022).

The aim of this original study was to evaluate the effects of a mindfulness training programme on pre-competitive anxiety, self-efficacy, the ability to manage emotions and performance in a back-court task with a ball-thrower and in an official match in competitive tennis players at a regional level.

METHOD

Sixteen male players (M = 22.4 years), ranked between 30/1 and 15/3 (French Tennis Federation) and who had been playing tennis for more than 6 years, volunteered to participate in this study. After signing a consent form, the participants were

randomly assigned (by drawing lots) to 2 experimental groups: Control (N = 8) or Mindfulness (N = 8). The players underwent 3 experimental phases: pre-test (30 forehands and backhands with a ball launcher + 1 tournament match), acquisition (6-week mindfulness training programme or listening to music), and post-test (30 forehands and backhands with a ball launcher + tournament match). This study, approved by the ethics committee of the ACTES laboratory (Urp5-4) at the University of the West Indies, was carried out following the Helsinki Declaration.

PROCEDURE

The experiment took place at the Amicale Tennis Club (Le Gosier, France), on outdoor hard courts. After the presentation of the study and the signature of the consent form, the participants carried out the 3 experimental phases.

The pre-test consisted of a back-court exercise with a ball launcher and a match in official competition (2 winning sets or a super tie break in the event of a tie at one set all). The test carried out with the ball launcher (Lobster Elite 2 type) consisted of returning 5 blocks of 6 balls from the baseline (the 30 balls were sent at high speed: 75 km/h and with an inter-ball delay of 2 seconds), with forehand and backhand shots. The instruction was to return the ball to the opposite side of the court. The accuracy of the returns (Figure 1), the speed of the balls (measured with a cordless R1000 radar gun), and the fouls committed (recorded with Swingvision software installed on an iPad pro) were recorded by the experimenters. Before carrying out the 30 strikes in the test, the players were asked to complete a self-efficacy questionnaire on their success in the ball-throwing exercise: "I think I can make at least x returns in the target zone out of the 30 balls", "yes or no", using six increasingly difficult statements ranging from 5 to 30. Finally, before the competitive match against a player of a similar ranking, the participants completed a questionnaire measuring their state of anxiety (Saviola et al., 2020 scale comprising 20 items, covering feelings and emotions experienced, assessed using a Lickert scale ranging from 1 'almost never' to 4 'almost always').

The number of gestures and speeches (positive, such as encouragement or closing the point, and negative, such as lowering the head or shoulders, huffing or cursing after a foul) during the match were also recorded by 2 experts, coaches, and referees, in a double-blind test.

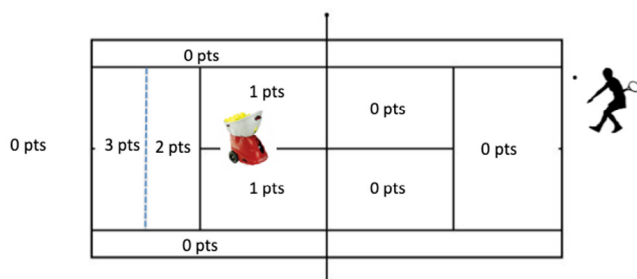


Figure 1: Accuracy score in the ball-throwing test.

The acquisition phase, which took place over 6 weeks, consisted of listening to an audio recording (background music without words) for the Control group or carrying out the "Mindfulness for Performance" programme (MFP, Fournier & Bernier., 2023) for the Mindfulness group. The MFP includes a daily meditative practice of about 10 minutes for the duration of the programme, administered with audio recordings sent to the mobile phones of the players in the Mindfulness group. In the first stage of the MFP, the players were asked to identify and use a personalised focus of attention (e.g. their breathing), after which mindfulness was introduced and practised with brief exercises (see Table 1). In 2ème time, acceptance was developed to help participants in the Mindfulness group to manage their negative sensations or feelings rather than blocking them. In a 3ème time, the skills of mindfulness and acceptance were integrated into the practice: the players had to become aware of the physical and psychological distractions occurring in the present moment, accept them, and refocus on their point of attention (see Fournier & Bernier, 2023 for a similar procedure).

DESCRIPTION OF THE MFP PROGRAMME

Table 1

Description of the 6-week "Mindfulness For Performance" programme (MFP, Fournier & Bernier., 2023).

Description of the MFP programme	
Week 1	Long scan (once a day for 7 days) and long sitting breathing concentration session (once a day for 7 days)
Week 2	Short scan (once a day for 7 days) and alternating between a long session of concentration on breathing in a seated position (once a day for 4 days) and a long session of concentration on breathing in a standing position (once a day for 3 days).
Week 3	Short scan (2 times a day for 7 days) and alternating between a long session of concentration on breathing in a seated position (1 time a day for 4 days) and an intermittent session of 1 minute of mindfulness / 1 minute of free activity (1 time a day for 3 days).
Week 4	Short scan (3 times a day for 7 days) and alternating between a concentration session on emotions and thoughts (1 time a day for 3 days), a long concentration session on breathing in a seated position (1 time a day for 2 days), and an intermittent session of 1 minute of mindfulness / 1 minute of free activity (1 time a day for 2 days).
Week 5	Short scan (3 times a day for 7 days) and alternating between a concentration session on emotions and thoughts (1 time a day for 3 days), a long concentration session on breathing in a seated position (1 time a day for 2 days), and an intermittent session of 1 minute of mindfulness / 1 minute of free activity (1 time a day for 2 days).
Week 6	Short scan (3 times a day for 7 days) and alternating sessions of concentration on emotions and thoughts (1 time a day for 3 days), a long session of concentration on breathing in a seated position (1 time a day for 2 days), and an intermittent session of 30 seconds of mindfulness / 30 seconds of free activity (1 time a day for 2 days).

The post-test was identical to the pre-test.

During these tests and matches, new balls (Head pro) were used. In addition, scores for self-efficacy, pre-competitive anxiety and return accuracy, ball speed, number of faults, positive and negative speeches, and positive and negative gestures were measured or recorded. Normally distributed dependent variables (Kolmogorov-Smirnov tests) were subjected to repeated-measures ANOVAS (pre-test vs. post-test) with independent groups (control vs. mindfulness). Post-hoc analyses (Newman-Keuls test) and an alpha threshold of .05 were used.

RESULTS WITH THE PITCHING MACHINE

Statistical analysis revealed that the players in the Mindfulness group improved their self-efficacy score (+30%) between the pre-test and post-test ($p < .05$), whereas that of the Control group remained stable (-5%) between tests (see Figure 2 A).

The ANOVA on the speeds of the returns to the back-court exercise performed with the ball-thrower showed no significant difference between the groups (Mindfulness and Control) or between the tests ($ps > .05$).

The ANOVA on the ball-throwing accuracy scores showed that all the players improved their performance (+10% for the Control group and +46% for the Mindfulness group) between pre-and post-test ($p < .01$), but also that the Mindfulness group outperformed the Control group at post-test ($p < .05$), as shown in Figure 2 B.

The ANOVA on the number of fouls (-15% for the Control group and -45% for the Mindfulness group) committed during the ball-throwing exercise showed that the players in the 2 experimental groups reduced the number of fouls between the pre-and post-test ($p < .05$), and that the players who benefited from the mindfulness programme made fewer fouls in the post-test than those in the Control group ($p < .05$), see Figure 2 C.

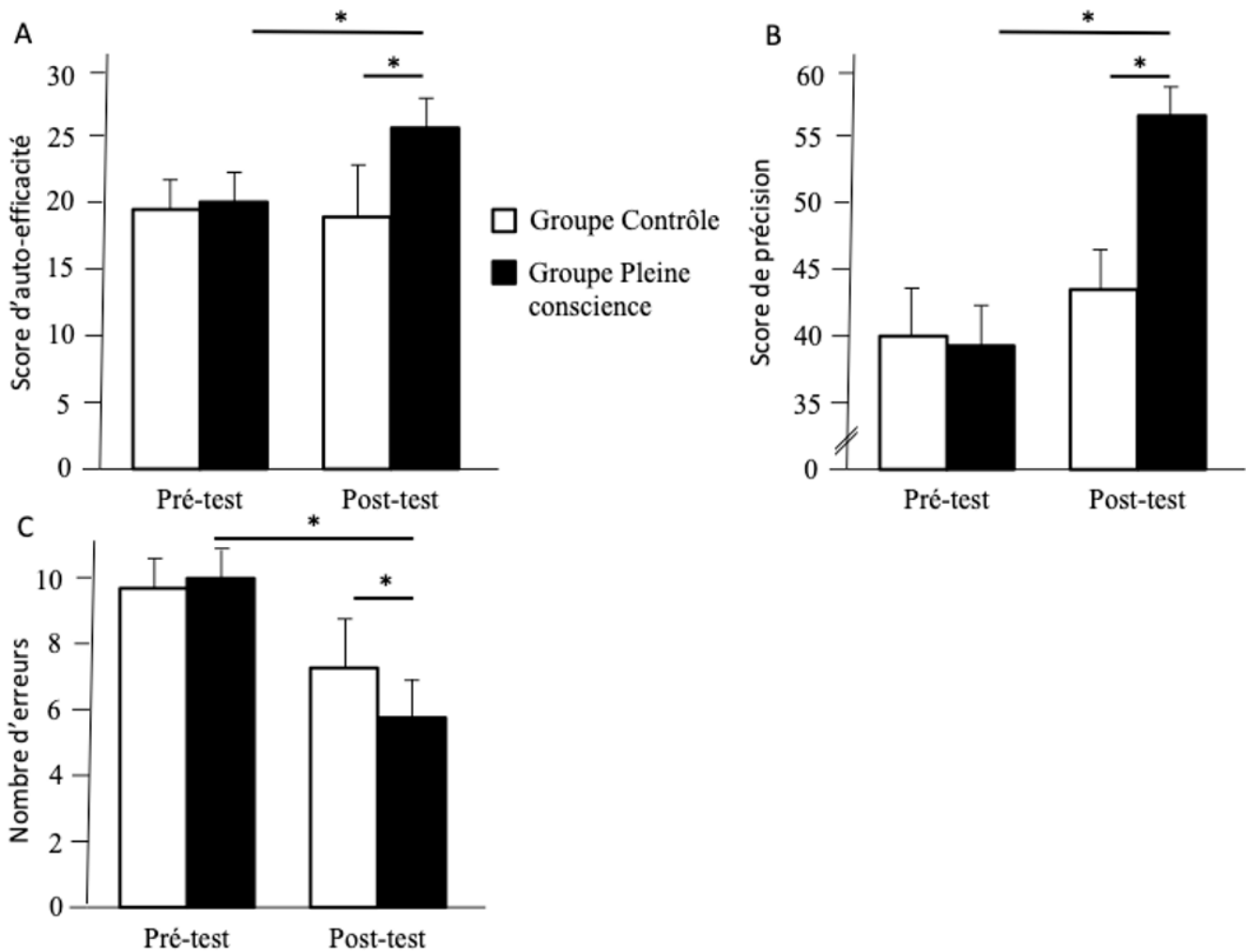


Figure 2: Scores for self-efficacy (A), performance (B) and number of errors (C) in the ball-throwing exercise for participants in the Control (white) and Mindfulness (black) groups, in the pre- and post-tests (* $p < .05$).

COMPETITION RESULTS

Statistical analysis of the pre-competitive anxiety score did not reveal any significant difference between groups or between tests ($p > .05$), but did reveal a trend ($p = .06$) of a decrease in the pre-competitive anxiety score between the pre-test and the post-test (-12%) for participants in the Mindfulness group.

Similarly, the statistical analyses carried out on the number of positive gestures and the number of positive speeches, in matches, did not reveal any difference between the groups ($p > .05$) or between the tests ($p > .05$).

On the other hand, the ANOVA on the number of negative gestures and speeches recorded during the match showed that the players in the Mindfulness group reduced the number of negative gestures ($p < .05$; see Figure 3 A) by 42% and the number of negative speeches ($p < .05$) by 33% between the pre-test and the post-test, and made fewer negative speeches in the post-test ($p < .05$) than the players in the Control group (see Figure 3 B).

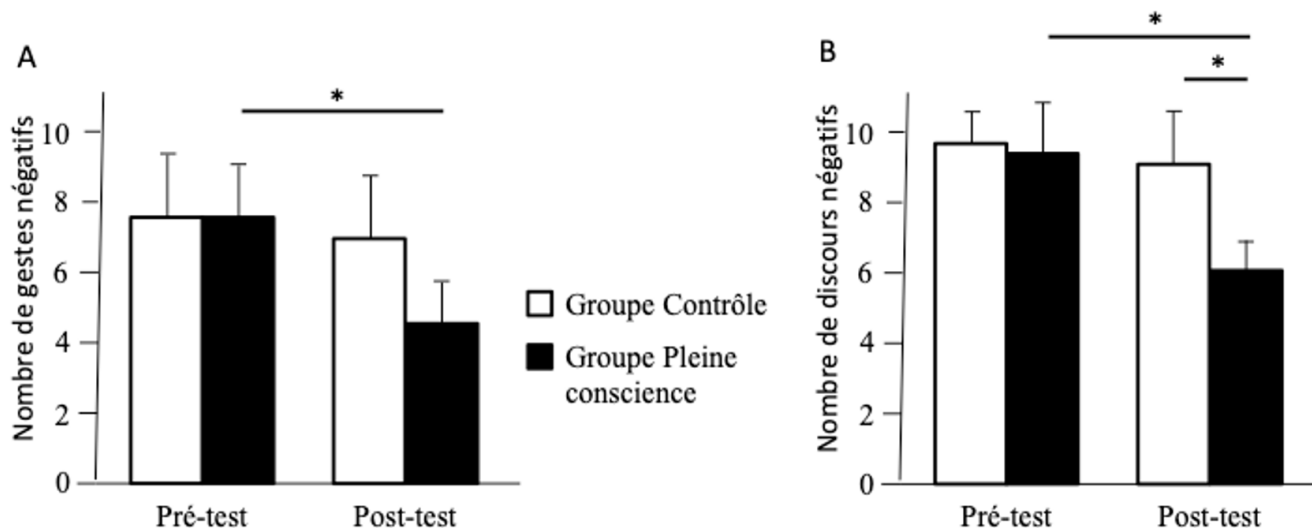


Figure 3: Averages of the number of negative gestures (A) and negative speeches (B) observed in a match for participants in the Control (white) and Mindfulness (black) groups, during the pre- and post-tests (* $p < .05$).

DISCUSSION

The aim of this experiment was to evaluate the effects of a 6-week mindfulness training programme on pre-competitive anxiety, feelings of self-efficacy, the ability to manage emotions and performance in regional-level competitive tennis players.

Firstly, the results of this study show the beneficial effects of the MFP mindfulness programme on performance in the ball-throwing exercise. Indeed, the players who developed their mindfulness skills using the MFP programme obtained better scores and made fewer errors than the participants in the Control group. These results confirm those of previous research studies showing the beneficial effects of mindfulness in sport (Baltzell, 2016) and particularly in tennis (Hoja & Jansen, 2019). The latter authors have, for example, observed positive effects of mindfulness on players' concentration and accuracy when serving, confirming the beneficial effects of this mental technique on motor performance (e.g., Gooding & Gardner, 2009; Nien et al., 2020; Tebourski et al., 2022). In addition, the results of our study showed an increase in the self-efficacy score in participants who had benefited from the MFP programme, confirming the results of a recent study showing a positive effect of mindfulness on the feeling of self-efficacy (Chandna et al., 2022).

In addition, this mental technique can also be used for stress management (Chang et al., 2004), for example by reducing the number of negative gestures and speeches, as observed

in this study, which can be a source of stress during a match. In addition, although not significant, the results of this study also showed a trend towards a reduction in pre-competitive anxiety in players who had followed the MFP mindfulness programme, indicating that this technique could help to better manage pre-match stress. The effects of the MFP programme on reducing anxiety, observed in participants in the Mindfulness group, are in line with previous work in the literature which has shown that mindfulness has a positive influence on reducing anxiety (e.g., Dheghani et al., 2018; Wolsh et al., 2021).

Finally, in addition to a reduction in the number of negative speeches and gestures during matches, we also observed an improvement in accuracy and a reduction in errors when throwing the ball. It is highly likely that the development of lucidity, acceptance, and 'refocusing' skills during the MFP programme helped the players in the Mindfulness group to improve their concentration, particularly during the ball-throwing accuracy exercise, and to better manage their emotions felt during the competition (Baltzell, 2016), resulting in a reduction in negative verbalized aloud internal gestures and speech that can have deleterious effects on sports performance (Boudreault et al., 2016; Martínez-Gallego & Molina, 2019). For this reason, we recommend that players, trainers, and coaches use exercises to develop and then maintain the skill of mindfulness, which can have positive effects on tennis performance (Van de Braam & Aherne, 2016).

This experiment is not without its limitations. Indeed, this exploratory study involved a limited number of participants (N=16). Although the sample size is like that of other studies in the field (e.g., Hoja et al., 2019), further research with larger samples seems necessary before any generalisation. In addition, the measures of speech and gestures (positive and negative) only covered one match. In future research, it would be interesting to measure these variables over a larger number of matches (both pre-tests and post-tests), while trying to control the duration of the matches with, for example, multi-chance tournament-type competitions (MCT with 4 games per set and no advantages) for the pre- and post-tests. Finally, as this study was only carried out with men, it would be interesting to see whether similar results could be observed with a female population.

CONCLUSION

The results of this experiment show that developing the capacity for mindfulness, through the MFP programme, increased tennis players' sense of self-efficacy and their performance in a cross-court exercise using a ball thrower. In addition, the development of mindfulness skills enabled regional-level competitors to reduce the number of negative external gestures and self-talk during competition. These results lead us to suggest that tennis players and coaches develop and maintain mindfulness skills, using the Mindfulness For Performance (MFP) programme for example.

CONFLICT OF INTEREST AND FINANCING

No conflicts of interest are to be declared for this study, which received no funding.

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REFERENCES

- Baltzell, A. L. (2016). Mindfulness and performance. In I. Ivztan & T. Lomas (Eds.), *Mindfulness in positive psychology: The science of meditation and wellbeing* (pp. 64-79). Routledge/Taylor & Francis Group.
- Boudreault, V., Trottier, C., & Provencher, M. (2016). Self-talk in sport: A critical review. *Staps*, 111, 43-64. <https://doi.org/10.3917/sta.111.0043>
- Cece, V., Guillet-Descas, E., & Martinent, G. (2020). Mental training program in racket sports: A systematic review. *International Journal of Racket Sports Science*, 2(1), 55-71.
- Chandna, S., Sharma, P., & Moosath, H. (2022). The Mindful Self: Exploring Mindfulness in Relation with Self-esteem and Self-efficacy in Indian Population. *Psychological studies*, 67(2), 261-272. <https://doi.org/10.1007/s12646-021-00636-5>
- Chang, V. Y., Palesh, O., Caldwell, R., Glasgow, N., Abramson, M., Luskin, F., Gill, M., Burke, A., & Koopman, C. (2004). The effects of a mindfulness-based stress reduction program on stress, mindfulness self-efficacy, and positive states of mind. *Stress and Health: Journal of the International Society for the Investigation of Stress*, 20(3), 141-147.
- Crespo, M., Reid, M., & Quinn, A. (2006). *Tennis Psychology: 200+ Practical Drills and the Latest Research*. International Tennis Federation. ITF Ltd.
- Daino, A., Costa, V., Martori, R., & Costa, S. (2021). Emotions in young tennis players: A new tennis-specific scale. *ITF Coaching & Sport Science Review*, 29(85), 18-21. <https://doi.org/10.52383/itfcoaching.v29i85.290>
- Dehghani, M., Saf, A. D., Vosoughi, A., Tebbenouri, G., & Zarnagh, H. G. (2018). Effectiveness of the mindfulness-acceptance-commitment-based approach on athletic performance and sports competition anxiety: a randomized clinical trial.
- Foster, B. J., & Chow, G. M. (2020). The effects of psychological skills and mindfulness on well-being of student-athletes: A path analysis. *Performance Enhancement & Health*, 8(2), 100180. <https://doi.org/10.1016/j.peh.2020.100180>

- Fournier, J. (2021). Mindfulness and mental preparation. In *Advancements in Mental Skills Training*; Bertollo, M., Filho, E., Terry, P., Eds; Routledge: London, UK, pp. 57-59.
- Fournier, J., & Bernier, M. (2023). Mindfulness: Pleine conscience pour la performance. Le programme de préparation mentale des athlètes. <https://www.fnac.com/a17680652/Jean-Fournier-Mindfulness-pleine-conscience-pour-la-performance>
- Gardner, F. L., & Moore, Z. E. (2007). The psychology of enhancing human performance: The Mindfulness-Acceptance-Commitment (MAC) approach (p. xxii, 289). Springer Publishing Co.
- Gooding, A., & Gardner, F. L. (2009). An investigation of the relationship between mindfulness, preshot routine, and basketball free throw percentage. *Journal of Clinical Sport Psychology*, 3(4), 303-319.
- Hoja, S., & Jansen, P. (2019). Mindfulness-based intervention for tennis players: a quasi-experimental pilot study. *BMJ Open Sport & Exercise Medicine*, 5, e000584. doi:10.1136/bmjsem-2019-000584
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144-156. <http://dx.doi.org/10.1093/clipsy/bpg016>
- Martin, C. (2018). *Tennis: optimising performance*. Louvain-la-Neuve: De Boeck Supérieur.
- Martinez-Gallego, R., & Molina, D. C. (2019). The influence of non-verbal body language on sport performance in professional tennis. *ITF Coaching & Sport Science Review*, 27(79), 34-37. <https://doi.org/10.52383/itfcoaching.v27i79.83>
- Mamassis, G., & Doganis, G. (2004). The effects of a mental training program on juniors pre-competitive anxiety, self-confidence, and tennis performance. *Journal of Applied Sport Psychology*, 16, 118-137. doi: 10.1080/10413200490437903
- Nien, J. T., Wu, C. H., Yang, K. T., Cho, Y. M., Chu, C. H., Chang, Y. K., & Zhou, C. (2020). Mindfulness Training Enhances Endurance Performance and Executive Functions in Athletes: An Event-Related Potential Study. *Neural plasticity*, 2020, 8213710. <https://doi.org/10.1155/2020/8213710>
- Reid, M., Crespo, M., Lay, B., & Berry, J. (2007). Skill acquisition in tennis: research and current practice. *Journal of science and medicine in sport*, 10(1), 1-10. <https://doi.org/10.1016/j.jsams.2006.05.011>
- Robin, N., Carrien, R., Boudier, C., & Dominique, L. (2021). Internal discourse optimizes the positive effects of mental imagery during service learning in beginners. *ITF Coaching & Sport Science Review*, 29(85), 9-11.
- Robin, N., & Dominique, L. (2022). Mental imagery and tennis: a review, applied recommendations and new research directions. *Movement and Sports Sciences*, doi: 10.1051/sm/2022009
- Robin, N., Ishihara, T., Guillet-Descas, E., & Crespo, M. (2023). Editorial: Performance optimization in racket sports: The influence of psychological techniques, factors, and strategies. *Frontiers in Psychology*, 14, 1140681. doi: 10.3389/fpsyg.2023.1140681
- Van de Braam, M., & Aherne, C. (2016). Mindfulness: Applications in tennis. *ITF Coaching & Sport Science Review*, 24(70), 3-4. <https://doi.org/10.52383/itfcoaching.v24i70.207>
- Van Raalte, J. L., Cornelius, A., Brewer, B. W., & Hatten, S. J. (2000). The antecedents and consequences of self-talk in competitive tennis. *Journal of Sport & Exercise Psychology*, 22, 345-356.
- Tebourski, K., Bernier, M., Ben Salha, M., Souissi, N., & Fournier, J. F. (2022). Effects of Mindfulness for Performance Programme on Actual Performance in Ecological Sport Context: Two Studies in Basketball and Table Tennis. *International journal of environmental research and public health*, 19(19), 12950. <https://doi.org/10.3390/ijerph191912950>
- Wolch, N. J., Arthur-Cameselle, J. N., Keeler, L. A., & Suprak, D. N. (2021). The effects of a brief mindfulness intervention on basketball free-throw shooting performance under pressure. *Journal of Applied Sport Psychology*, 33(5), 510-526.

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