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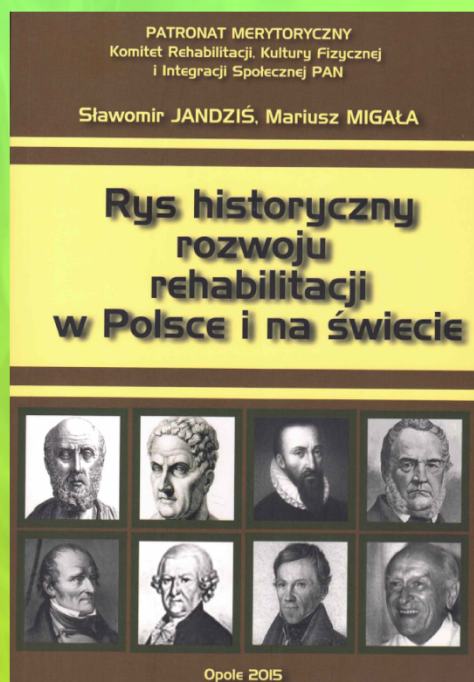
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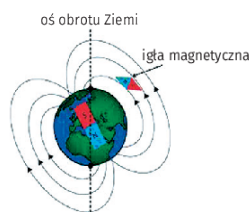
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Mindfulness training in swimming: Efforts to reduce burnout and stress in junior athletes

Trening uważności w pływaniu: próby zmniejszenia wypalenia i stresu u młodych sportowców

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Abstract

Purpose. The application of mindfulness training in sports activities showed enhancement, but lack of evidence about the effects of mindfulness associated with burnout and stress in junior swimming athletes through mixed research methods which created a gap in this study. Therefore, this research analyzed the effects of mindfulness on burnout and stress.

Material and methods. Mixed method research with 51 junior swimming athletes involved in this study. In this quantitative research, burnout level was measured using the Burnout Scale for University Athletes, while stress level was measured using The Perceived Stress Scale. The instruments in qualitative research involved in-depth interviews.

Results. First, the findings of the quantitative research found that there were no differences in burnout and stress scores in the mindfulness and control groups at the baseline stage ($p \geq 0.05$), but there were differences at the post stage ($p \leq 0.05$). While the results of the qualitative research showed diverse perceptions of participants including the advantage, drawbacks and impact of mindfulness training.

Conclusions. Thus, our research confirms and highlights that mindfulness training is proven to be an alternative and solution for athletes in reducing burnout and stress levels intended for junior swimming athletes.

Keywords

mindfulness training, psychological performance, competitive sports

Streszczenie

Cel. Stosowanie treningu uważności w działalności sportowej powoduje poprawę, jednak brakuje dowodów na efekty związane z wypaleniem i stresem u młodych pływaków badanych za pomocą mieszanej metody badań. Dlatego niniejsze badanie analizowało wpływ uważności na wypalenie i stres.

Materiał i metody. Badanie o mieszanej metodologii z udziałem 51 młodych pływaków. W tym badaniu ilościowym poziom wypalenia mierzono przy użyciu Skali Wypalenia dla Sportowców Uniwersyteckich, natomiast poziom stresu mierzono przy użyciu Skali Postrzeganego Stresu. Narzędzia w badaniu jakościowym obejmowały pogłębione wywiady.

Wyniki. Po pierwsze, wyniki badań ilościowych wykazały, że nie było różnic w wynikach wypalenia i stresu w grupach treningu uważności i kontrolnej w fazie początkowej ($p \geq 0,05$), ale były różnice w fazie końcowej ($p \leq 0,05$). Tymczasem wyniki badań jakościowych pokazały zróżnicowane postrzeganie przez uczestników, obejmujące zalety, wady i wpływ treningu uważności.

Wnioski. Badania potwierdzają i podkreślają, że trening uważności jest sprawdzonym alternatywnym rozwiązaniem dla sportowców w redukcji poziomów wypalenia i stresu, przeznaczonym dla młodych pływaków.

Słowa kluczowe

trening uważności, wydajność psychiczna, sporty wyczynowe

Introduction

Swimming is one of the most famous competitive sports in the world and many athletes often experience psychological disorders. The data showed that there were several factors that can interfere psychology of athletes, for example, intense training schedules and competitions, slow healing injuries, intense competition with opposing teams [1]. The impact of these disorders could cause anxiety, negative emotions [2], burnout [3], and stress among junior athletes [4]. Even though according to Shang & Yang [5], the psychological quality of an athlete affects the results of the competition, so coaching and developing psychological elements for athletes is crucial in sports.

Burnout is a negative psychological symptom which becomes to an attention and needs to be reduced in athletes [6]. In general, burnout can be interpreted as mental fatigue, depersonalization and decreased personal achievement in athletes [7, 8, 9]. Burnout can cause someone feel tired, unmotivated and listless [10, 11]. Previous research reported that burnout level can increase when athletes experienced excessive training hours [12, 13], intense competition schedules [14, 15], injuries [16], decreased performance [5], resulting in a negative impact on mental and physical health [17], and sport carrers termination [18, 19]. Wilczynska et al [20], explained that burnout can lead to low mood states, high emotions to behavioral problems such as doping and absence from training sessions or competitions.

Stress is a global issue that attacks athletes in various types of sports [21, 22, 23]. Stress is a term that describes the psychological condition of a person who has experienced disturbance from the surrounding environment [24, 25, 26]. Data shows that high stress could have a negative impact on the body and mind [27], but a low level of stress has a potential to increase athletes performance. A study reported that success in competitive sports was not only influenced by technical and physical, but the main key was the ability to deal with stress [28]. Bearing in mind the importance of managing stress for athletes, many coaches include mental training in their programs [29]. One method that is currently becoming a trend and is often used by coaches in several sports is mindfulness.

The mindfulness method is psychological training by consciously meditating and focusing on cognitive processes, emotions and experiences [30, 31, 32]. Well-documented mindfulness training can provide positive benefits for athletes, for example, it can reduce anxiety [33], depression [34], and stress [35, 36]. In addition, previous research has reported that mindfulness could improve the attention and mental health of athletes [37]. According to Josefsson et al [2], mindfulness did not directly affect the performance of an athlete, but through the effects of meditation in mindfulness it could decrease the stress level and increase athletes performance. In addition, mindfulness can create a calm feeling and positive thinking [38], in this way it was proven that physical health and cognition could be increased [39], back pain and insomnia could be reduced [40]. Research on mindfulness has been well documented globally [41, 42, 43, 33, 44]. In addition, previous research on mindfulness used experimental research [45, 46, 47], and systematic reviews [48, 18], and bibliometric [49]. However, the lack of evidence reporting the effect of mindfulness to reduce burnout and stress levels in swimming athletes was a gap in this study. In addition, this study offered a unique and novel way of testing the effects of mindfulness through mixed methods research. It is expected that this research can become a psychological training innovation for swimming athletes in the future. Therefore, this study aims to reduce burnout and stress symptoms in junior athletes who were intense in swimming through mindfulness training.

Materials and methods

There were 52 junior swimming athletes (males) from Jakarta State University (Indonesia) were involved in our mixed research. The selected participants have met predetermined criteria, for example junior athletes competing at the national or international level, and must be present in all intervention activities. This recruitment process was held prior to the study, namely in May 2023. However, 1 participant left the research activity, thus only 25 participants in the control group and 26 in the mindfulness group completed the study. Table 1 displays characteristics of the participants. While the participant recruitment and study flow are presented in Figure 1.

Table 1. Characteristics of the participants (Mean \pm Standard deviations)

Characteristics	Control (n = 25)	Mindfulness (n = 26)
Age [years]	18.40 \pm 1.04	18.77 \pm 1.10
Height [cm]	160.24 \pm 3.39	161.23 \pm 2.84
Weight [kg]	58.56 \pm 3.02	60.38 \pm 3.38

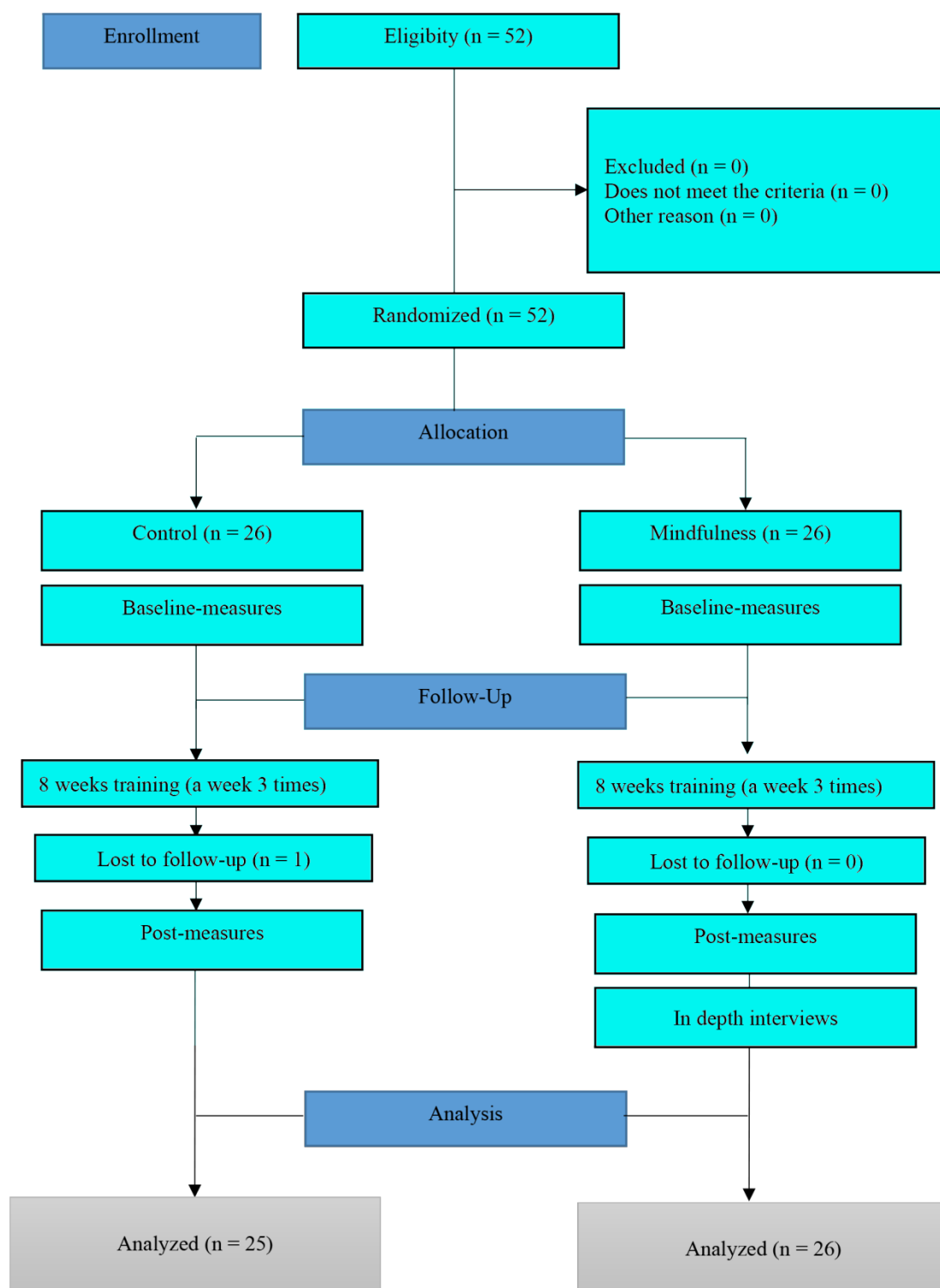


Figure 1. Participant recruitment and study flow

Instruments

Quantitative instruments

In quantitative research through experiments, used the following instruments:

Burnout. The Burnout Scale for University Athletes was used to assess burnout levels among athletes. This instrument has 20 items of questions from 4 sub-scales namely: (i) Interpersonal Exhaustion, (ii) Lack of Achievement, (iii) Emotional Exhaustion

for Athletic Training and (iv) Devaluation of Club Activities. There was a five-point scale from 1 "Absolutely Untrue" to 5 "Very True" to answer this instrument. Higher total scores indicate high burnout in athletes [3].

Stress. The Perceived Stress Scale (PSS-10) is used to assess the stress level of athletes who adopted from previous studies [61]. This instrument has 6 items negatively (e.g., "In the past month,

how often did you feel unable to control important things in your life”) and 4 questions positively (e.g., “In the last month, how often did you feel you were well able control your life”. This instrument is answered using a Likert scale from a value of 0 = never to 4 = very often. The final score is calculated and the highest score indicates a higher level of stress.

Qualitative instruments

While the instrument used in qualitative research was in-depth interviews with participants who were in the mindfulness group for 30 minutes. The interview was conducted using Bahasa. This in-depth interview instrument had been used in previous studies and had proven effective in revealing issues in qualitative research [50, 51].

Procedure

This research was conducted at Jakarta State University from May-June 2023 (approval number: 3309/UNJ/2023). In addition, this study follows guidelines from the Jakarta State University which uses research objects on humans, for example, information about participants must be kept confidential.

In this mixed study, the first experiment was carried out for 8 weeks. In the pretest (baseline) activities, all participants filled out the burnout and stress questionnaire from 10.00-11.00 noon (09 May 2023). On the second day, the participants in the control group only carried out the daily psychological training and the intervention group carried out a mindfulness program, all of these activities were carried out from 08.00-09.00 in the morning (11 May 2023-17 June 2023). Then the post-test activity was carried out on June 20, 2023, all participants filled out the burnout and stress questionnaire from 12.00-13.00 noon.

Whereas the qualitative research through in-depth interviews was carried out on June 22 2023 at Jakarta State University, the mindfulness group was interviewed for 30 minutes individually about the advantages, drawbacks and impacts of the mindfulness training program. Interviews were conducted using Bahasa.

Mindfulness intervention

The instructor introduced the mindfulness concept to the participants for 10 minutes, which included the introduction to mindfulness and the importance of mindfulness in swimming. Then they were instructed to meditate in an empty, quiet room, comfortably with equipment such as mats and they had to listen to a 50-minute mindfulness training audio recording. Mindfulness training audio recordings were created by a mindfulness instructor with over 5 years of experience. The goal of the practice is to release their minds and accept every incident that has happened.

Statistical analysis

Quantitative analysis

In quantitative research, statistical descriptive data for each group are presented in mean \pm standard deviation. Normality test was conducted through Kolmogorov-Smirnov. An Mann-Whitney U tests was used to compare differences in burnout and stress scores between the control and mindfulness groups before (baseline) and after (post) the experiment. $p < 0.05$ to determine statistical significance. All data was analyzed via IBM SPSS v.25.0.

Qualitative analysis

Whereas in qualitative research using qualitative thematic analysis [5]), includes: recording the results of interviews with participants, data coding and categorized into three major themes which include: (i) advantages, (ii) drawbacks and (iii) mindfulness impact.

Results

Quantitative results

Quantitative research results show that data is not normally distributed. Table 2 shows that there is no difference in burnout and stress scores in mindfulness and controls at the pre-experimental (baseline) stage ($p \geq 0.05$). While Table 3 shows different results, where there is a significant difference in scores between the two groups at the post-experimental stage ($p \leq 0.05$).

Table 2. Results of scores between two groups before (baseline) experiment

Variable	Group	N	Mann-Whitney U tests			
			Mean Rank	Z	p	Cohen'd
Burnout (points)						
Interpersonal exhaustion	Control	25	24.00	−0.752	0.452	−0.11
	Mindfulness	26	27.00			
Lack of achievement	Control	25	24.56	−0.701	0.483	−0.11
	Mindfulness	26	27.38			
Emotional exhaustion for athletic training	Control	25	26.34	−0.166	0.868	−0.02
	Mindfulness	26	25.67			
Devaluation of club activities	Control	25	27.54	−0.740	0.459	−0.10
	Mindfulness	26	24.52			
Stress (points)						
Perceived Stress-negatively	Control	25	24.82	−0.569	0.570	−0.08
	Mindfulness	26	27.13			
Perceived Stress-positively	Control	25	24.94	−0.526	0.599	−0.07
	Mindfulness	26	27.02			

Note: significance level at $p \leq 0.05$

Table 3. Results of scores between two groups after (post) experiment

Variable	Group	N	Mann-Whitney U tests			
			Mean Rank	Z	p	Cohen'd
Burnout (points)						
Interpersonal exhaustion	Control	25	35.04	−4.326	0.000	−0.61
	Mindfulness	26	17.31			
Lack of achievement	Control	25	32.16	−2.965	0.003	−0.42
	Mindfulness	26	20.08			
Emotional exhaustion for athletic training	Control	25	34.08	−3.903	0.000	−0.55
	Mindfulness	26	18.23			
Devaluation of club activities	Control	25	37.70	−5.561	0.000	−0.78
	Mindfulness	26	14.75			
Stress (points)						
Perceived Stress-negatively	Control	25	33.30	−3.515	0.000	−0.49
	Mindfulness	26	18.98			
Perceived Stress-positively	Control	25	32.68	−3.225	0.001	−0.45
	Mindfulness	26	19.58			

Note: significance level at $p \leq 0.05$

Qualitative Results

The results of qualitative research through in-depth interviews with the participants obtained the following information:

Theme 1: Advantages

Time

"From our perspective, the first advantage lies in the use of time, mindfulness training with 1 hour can calm our minds and bring up positive thoughts. We feel happy and calm" (Results of interviews with participants 2, 5, 7, 9, 10, 26).

In a short time we can meditate in a calm and comfortable manner, so we can accept all the mistakes we made in the training sessions. In that way, we feel more enthusiastic and more motivated for further training (Results of interviews with participants 1, 3, 4, 11, 13, 16, 19, 24).

Cost and equipment

It could be argued that the second advantage lies in the low cost ! This mindfulness training does not require a lot of money and it is enough to provide an empty room with a mattress (Results of interviews with participants 6, 8, 12, 14, 17, 18, 21). Other participants argue that:

"This training program has a low cost and does not require a lot of equipment. For example, with a clean and quiet classroom, we can do meditation in peace. We prefer this training" (Results of interviews with participants 15, 20, 22, 23, 24, 25).

Theme 2: Drawbacks

Meditation locations

It would seem that the first drawback is the mindfulness training was conducted in uncomfortable and noisy place which cause us difficult to meditate and calm down. Therefore, before starting this training it is recommended to find a conducive location (Results of interviews with participants 1, 14, 3, 25, 21, 7, 15, 26).

"Location is an important place, because it greatly affects the level of effectiveness of the mindfulness training program. If the location is uncomfortable, it will be difficult to focus our mind" (Results of interviews with participants 23, 2, 4, 6, 20, 21, 9, 24).

Equipment

In our opinion, The second drawback is the equipment that must be provided, because it supports us to carry out this training optimally. For example, mats or carpets for us to meditate on (Results of interviews with participants 12, 13, 16, 18, 23, 25, 19). The next participant gave the perception:

"Equipment is an important factor that basically has to be prepared. If you don't have a mattress, you can use a mat or newspaper, and you should prepare a candle so that meditation can be conducted optimally. If all of this equipment does not exist, there will be a shortage and will have an impact on the ineffectiveness of this training" (Results of interviews with participants 10, 5, 17, 22, 11, 8).

Theme 3: The impact of mindfulness

The impact of mindfulness on burnout

Participants argued that:

According to our perception, the impact of using mindfulness training programs is very effective in reducing the level of burnout. After participating in this program we become more enthusiastic and energetic in participating the training program provided by the trainers (Results of interviews with participants 2, 4, 5, 7, 8, 14, 15).

"This program is amazing!! The burnout that we felt began to decrease, so that our mood, interest and motivation in exercising increased" (Results of interviews with participants 1, 11, 12, 18, 19, 20, 21).

Burnout has always been a problem for us when carrying out intense training and competition schedules, so we emphasized that mindfulness programs could reduce burnout level (Results of interviews with participants 3, 6, 9, 10, 13, 16).

The impact of mindfulness on stress

We confidently stated that this program not only has a positive impact on reducing burnout, but also on stress. All negative thoughts that have always become frightening figures slowly began to disappear and we felt that our mental health was much better than before (Results of interviews with participants 17, 22, 23, 24, 25, 26).

Discussion

This mixed study attempted to reveal the effects of a mindfulness training program on reducing burnout and stress levels among junior swimmers.

There were several findings in this quantitative study. First, there was no difference in burnout levels between the two groups before (baseline) the experiment, but in the post-experimental stage it was seen that there was a significant difference in burnout levels between the mindfulness and control groups. In addition, this study proved that mindfulness training has a higher effect than controls. This is because mindfulness training presents and promotes a meditation practice that help mind becomes more focused on what is happening around or has been experienced by an athlete [52, 53]. In addition, we also observe that another power of mindfulness can help athletes be more aware of their surroundings and be able to accept emotions [54]. According to previous research, burnout in athletes can be reduced by creating positive emotions to fight negative emotions, so that burnout level could decrease [52]. Mindfulness training helps athletes to have an open (positive) mind [55], and emphasizes not being judgmental about the experiences, so that it allows athletes at low risk to experience burnout disorder [18]. Research conducted by Zuniga et al [56], found that mindfulness-based training could reduce burnout significantly, but this practice must be closely guided and supervised by instructors who are experienced in mindfulness. Other studies also reported the same results, burnout often appears in athletes when facing various kinds of problems such as intense training and competition, injuries, so mindfulness training is the appropriate solution for athletes to relieve burnout symptoms [57, 33]. In addition, Gustafsson [58], conducted research on elite athletes, the results showed that mindfulness programs can prevent and slowly restore burnout. Whereas in the control group we found that burnout had decreased, but not significantly compared with the mindfulness group [35].

Second, findings in quantitative research showed that mindfulness training was effective in reducing stress levels in junior swimming athletes. This is because it can change their minds and souls to be more positive and calm [37]. Mindfulness training emphasizes that athletes must realize and accept their mind, also inspire them to control their mind, so that they can trigger positive emotions to eliminate negative emotional states [33]. Mindfulness training helped athletes had less stress symptoms than other athletes who did not conduct the mindfulness training [32]. This is because through meditation, the brain is indirectly trained to think consciously and positively about the past and present [59], so that slowly the heart becomes calm and in the end the stress begins to decrease [60]. The findings in this study are consistent with previous findings which reported that continuous mindfulness training can reduce stress levels

experienced by athletes [35, 34]. Likewise with the study of Fronso, Robazza, Bondár & Bertollo [61], who reported that mindfulness training has a good strategy, because it can help athletes to adapt with their surroundings and it can be used to manage stress. On the other hand, Hut, Glass, Degnan & Minkler [31], reported their findings that mindfulness can help athletes with the ability to manage stressful emotions. In fact, according to Liu, Zhang, Liu & Zhang [38], mindfulness training focuses on encouraging athletes to accept and not judge a previous experience, this training could help to release ruminative distractions which trigger a higher stress. Whereas in the control group we also found that stress could be decreased, but it was not lower than the mindfulness intervention group.

Whereas, the results in qualitative research showed that participants (athletes) provided diverse and positive perceptions about mindfulness training, for example this training has advantages in terms of less time usage in reducing burnout and stress. In addition, they argued that other advantages of mindfulness is it can be carried out anytime and anywhere and does not require expensive equipment. Furthermore, the participants argued that although mindfulness training has advantages, this training also has drawbacks, such as the location or place for conducting the training must be in a clean, comfortable and conducive place, to obtain an optimal result. In addition, if equipment such as mattress or carpets are not available it will reduce the level of effectiveness of mindfulness training. Finally, the participants also argued that the mindfulness training program was proven to have an impact on reducing burnout and stress levels among junior swimming athletes.

Finally, in this study, we found a uniqueness and novelty, namely mindfulness training has a positive effect on reducing burnout and stress levels from both a quantitative and qualitative research

Conclusion

Our research confirms and highlights that mindfulness training is proven to be an alternative and solution for athletes in reducing burnout and stress levels. This research contributes to the innovation and development of a psychological training model in swimming that is useful in reducing burnout and stress levels. Even so, this study still has limitations in terms of only involved participants (athletes) from one university in Indonesia. In addition, another limitation lies is only involved one gender, namely male. Thus overall limitations in our study did not investigate the effects of mindfulness training on gender. Therefore, future research needs to be carried out, for example using more participants from several universities in Indonesia or from other countries. Then future research is expected to be able to compare the effects of mindfulness training on male and female athletes in swimming or other competitive sports.

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