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ORIGINAL

MINDFULNESS AND SELF-COMPASSION IN MENTAL PREPARATION OF CHESS PLAYERS

MINDFULNESS Y AUTOCOMPASIÓN EN LA PREPARACIÓN MENTAL DE LOS JUGADORES DE AJEDREZ

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ABSTRACT

The purpose of the work is to study the role of mindfulness and self-compassion in the mental preparation of federated chess players. A cross-sectional study was carried out on 123 players using a battery of self-administered online questionnaires. Significant relationships were found between the chess strength of chess players and the *overidentification* and *common humanity* subscales, corresponding to self-compassion construct, and between the years practicing mindfulness with the mindfulness awareness subscale, self-compassion, the depression subscale and the depression-anxiety-stress construct. The structural equations model shows the positive relationship between mindfulness and self-compassion, the importance of self-compassion as a mediating variable between mindfulness and the depression-anxiety-stress construct, and a significant relationship between depression-anxiety-stress construct and sleep difficulties. The significance and novelty of the work lies in being the first study in which these relationships and the structural model are established in the field of sport.

KEY WORDS: Chess, mindfulness, self-compassion, psychological variables, structural equation, sports.

RESUMEN

El propósito del trabajo es estudiar el papel del mindfulness y de la autocompasión en la preparación mental de ajedrecistas federados. Se realizó un estudio transversal sobre 123 jugadores mediante una batería de cuestionarios autoadministrados *on line*. Se encontraron relaciones significativas entre el nivel de juego de los ajedrecistas y las subescalas *sobreidentificación* y *humanidad compartida*, correspondientes al constructo autocompasión, y entre los años de práctica de mindfulness y la subescala *consciencia* del constructo mindfulness, la autocompasión, la subescala *depresión* y el constructo depresión-ansiedad-estrés. El modelo de ecuaciones estructurales muestra la relación positiva entre mindfulness y autocompasión, la importancia de la autocompasión como variable mediadora entre mindfulness y el constructo depresión-ansiedad-estrés, y una relación significativa entre dicho constructo y las dificultades del sueño. La significación y novedad del trabajo reside en ser el primer estudio en el que se establecen estas relaciones y el modelo estructural en el ámbito del deporte.

PALABRAS CLAVE: Ajedrez, mindfulness, autocompasión, variables psicológicas, ecuaciones estructurales, deporte.

1. INTRODUCTION

Mindfulness is a quality of the mind that is present to varying degrees in everybody (Kiken et al., 2015; Wheeler et al., 2016). Kabat-Zinn pioneered the transfer of the Eastern contemplative schools to the West. His proposal is based on meditation and he considers mindfulness to be the skill of “paying attention in a specific way: deliberately, in the present moment, and without judging”, a type of attention that “enables higher awareness, clarity, and acceptance of the reality of the present moment to be developed”(Kabat-Zinn, 1994; Kabat-Zinn, 2009).

The specificity of this sporting context, with a marked focus on performance, requires an elevated level of sustained attention to the relevant clues to achieve the objectives and to disconnect from disruptive stimuli (Gardner & Moore, 2007; Moran, 2009; Thienot et al., 2014). It is therefore unsurprising that there are specific protocols. Regarding the interventions carried out in sport, since Kabat-Zinn and his colleagues introduced the Olympic rowing team to mindfulness at the Los Angeles Olympic Games in 1984, with excellent results in terms of both performance and psychological variables such as coping to the challenge of competition, tiredness, and recovery (Baltzell & Summers, 2017; Solé et al., 2014), there has been a growing interest in carrying out interventions in this field based on mindfulness (MBIs), and especially since the beginning of this century, with specific protocols for sport and an appreciable number of empirical results that support the positive contribution of mindfulness to athletes performance and general well-being. There are three important protocols, the *Mindfulness-Acceptance-Commitment* (Gardner & Moore, 2007), the *Mindful Sport Performance Enhancement* (Kaufman et al., 2009) and the *Mindfulness Meditation Training for Sport (Baltzell & Akhtar, 2014)*, a shorter intervention intended as an alternative to the first two, the program of which is centered around mindfulness meditation and includes psychological training techniques (*Psychological Skills Training*; PST) and, in its 2.0 version (Baltzell & Summers, 2017), self-compassion. See Table 1 for an exhaustive list of the MBIs applied to sport from De la Torre's review (2020).

Chess is a very mentally demanding sport related to all aspects of the higher-level cognitive processes such as deep concentration, strategic thought, episodic and qualified memory, problem solving, calculation, and decision-making, the objective of which is achieve high levels of competitive performance (Dincel et al., 2015; Moen et al., 2020). It is no surprise that chess is considered to be the sport with the highest intellectual content (Ruiz & Luciano, 2012), where the level of demand during competition is maximum for different reasons, among which are the time limit imposed on matches, the fact that a single mistake can cost the player the game, and the reality that once a move has been made it cannot be rectified (Ruiz, 2006; Ruiz & Luciano, 2012). Based on Ruiz & Luciano, we consider that the relevant behaviors of a chess player to achieve a high performance during a match can be summarized as follows: (a) managing the limited time available; (b) choosing each move with an assessment of their position as the main criterion; and (c) focusing on one's position on the board and not on private events (Ruiz & Luciano, 2012). Therefore, the characteristics of chess mean that there is enormous pressure not to make a mistake and to make the best move possible (Becker et al., 2023). This pressure can easily transform into stress and emotions like worry, fear of losing, and hesitation when having to make a decision, leading to competitive anxiety. Having tools to help with emotional regulation at one's disposal is therefore essential to obtain results (Fadul & Canlas, 2009; Moen et al., 2020). Bearing the above in mind, mental preparation becomes an important aspect to consider when preparing chess players to compete under the best conditions and to deliver a high sporting performance (Araújo et al., 2022). To this effect, one would expect there to be MBIs applied to the field of chess. However, a recent systematic review of the interventions based on mindfulness and acceptance in chess (i Canadella et al.)with a broad focus in the selection of studies revealed no MBIs applied to this

context, and only four brief Acceptance and Commitment Therapy interventions (ACTs)(Losada-Puente et al., 2020), all of which were carried out by the same researchers, with positive effects on improving performance, accompanied by moderate-large effect sizes. Improvements in psychological variables such as generic and applied to chess experiential avoidance, interference, believability, and control of private events in normal and difficult moments during competition were also observed, albeit to a lesser degree. Nonetheless, the results evidenced in the review require further empirical testing due to the high risk of bias in these studies, mainly because there was no randomized controlled trial among them, and also because of the limitations of the samples, some missing data, and the way of selecting the members of the control group when they were informed about it (ABDULLAH et al., 2022).

Besides mindfulness, there is also the concept of self-compassion, defined as "being touched by and open to one's own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one's suffering and to heal oneself with kindness" (K. Neff, 2003), given that a compassionate attitude towards oneself requires a balanced mental perspective, known as mindfulness (K. Neff, 2003). Furthermore, there are studies that show a strong correlation between mindfulness and self-compassion (r = 0.69) in the non-clinical population (Hollis-Walker & Colosimo, 2011) and that consider self-compassion to be an underlying mechanism in interventions based on mindfulness (Kuyken et al., 2010). We also consider that self-compassion is a potentially important variable for any athlete, and especially for a chess player, given that "offering an appropriate level of kindness in sports can be essential to dislodge you from intense performance anxiety or harsh self-criticism" (Baltzell & Summers, 2017). Both concepts mutually reinforce each other since mindfulness and self-compassion are effective in the treatment of anxiety (Chen et al., 2012; Torrealva & Bossio, 2019), and self-compassion even more so in the treatment of depression (Pauley & McPherson, 2010). Anxiety is the most studied psychological variable in sports (Prats & Mas, 2017; Torrealva & Bossio, 2019). All the above leads us to the study of anxiety and depression in mental preparation of chess players. Furthermore, mindfulness has found to be effective in the reduction of stress levels (John et al., 2011; Torrealva & Bossio, 2019). That is why stress is another of the variables to consider, given that it can cause reduced mental performance when it comes to making decisions, cognition, and perception (Eggert et al., 2013; Kavanagh, 2005), all of which are fundamental for chess. Furthermore, chronic stress is correlated with depression and anxiety, among other health problems (Eggert et al., 2013; Hadany et al., 2006) (Kemeny, 2003), and there are meta-analyses that conclude that mindfulness is effective in reducing stress levels in healthy individuals (Chiesa & Serretti, 2009; Khoury et al., 2015). Lastly, there are some studies that find a relation between insomnia and anxiety (Gómez-Benito et al., 2011). Nonetheless, a later study (Dincel et al., 2015)concluded that playing chess regularly does not affect the subjective quality of sleep and that it can potentially improve sleep through increasing mental activity and developing problem solving skills. Another very recent study Moen, Olsen & Hrozanova investigated the relationship between performance and sleep measured objectively in chess players, showing different patterns in players with positive and players with negative performance. Hence, we also consider it apt to include the sleep variable(Moen et al., 2020). Considering the above, the

purpose of the work is to study the role of mindfulness and self-compassion in the mental preparation of federated chess players. This is specified in three specific objectives:

First objective: Explore the relationship between the chess strength of chess players and the level of mindfulness, self-compassion, depression, anxiety and stress, and sleeping difficulties.
Second objective: Explore the relationship between years practicing mindfulness and the constructs of mindfulness, self-compassion, depression, anxiety and stress, and sleeping difficulties.
Third objective: Examine the relations among the constructs of mindfulness, self-compassion, depression, anxiety and stress, and sleeping difficulties, by using structural equation modeling based on the conceptual model presented in Figure 1.

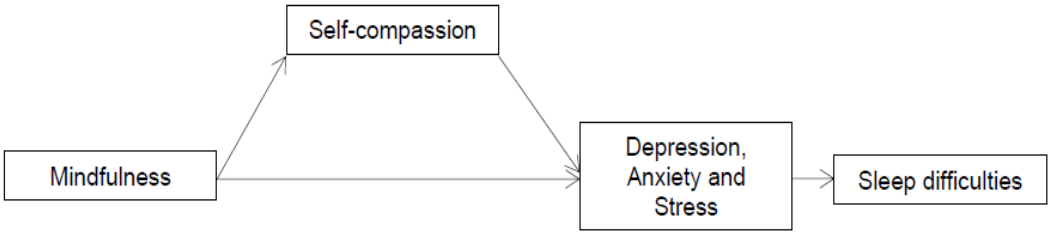

Figure 1 Conceptual model of the relationships among the constructs

2. METHOD

2.1 Participants

The sample consists of 123 federated chess players in the Catalan Chess Federation, all over 18 years old (between 21 and 74 years old), mainly men (94%), with a level of chess strength rating from not rated by Elo FIDE up to a level of 2548 points, most with no international chess title (89%), and all of whom understood written Spanish perfectly. A full breakdown of the sample's socio-demographic characteristics is shown in Table 1 of Appendix 1.

2.2 Measuring instruments

Philadelphia Mindfulness Scale (PHLMS). Originally developed in English by Cardaciotto et al., we used the Spanish version validated psychometrically by Tejedor et al. (Tejedor et al., 2014). It consists of 20 items shared equally between its two subscales, which measure awareness of the present moment (PHLMS-*Aw*) and acceptance of experience (PHLMS-*Acc*).

The aggregated score of the construct is not suitable for use because the two subscales are not correlated between them (Park et al., 2013) either in the original validation or in non-clinical samples, even though they have adequate internal consistency measured by the Cronbach's α, 0.75-0.82 for PHLMS-*Aw* and 0.84-0.91 for PHLMS-*Acc*. It has a 5-point (1-5) Likert-type response format (Cardaciotto et al., 2008).

Self-Compassion Scale Short Form (SCS-SF). Originally developed in English in its long 26-item version by Neff (K. D. Neff, 2003), and in its shorter 12-item version (SCS-SF) by Raes et al. (Raes et al., 2011).We used the short version in Spanish, validated by Garcia-Campayo et al. (2014). Both versions are divided into three facets or pairs of opposing subscales: the self-kindness facet (*SCSsf-SK*), made up of the subscales *self-kindness* (*Sk*) and *self-judgment* (*Sj*); the common humanity facet (*SCSsf-CH*), composed of the subscales *common humanity* (*Ch*) and *isolation* (*Is*); and the mindfulness facet (*SCSsf-M*), composed of the subscales *mindfulness* (*Mf*) and *over-identification* (*Oi*). Both spanish versions show a high level of internal consistency. More specifically, the 12 items version shows a Cronbach's α of 0.85, ranging from 0.71 to 0.77 for the 6 subscales (Garcia-Campayo et al., 2014). It has a 5-point (1-5) Likert-type response format.

Depression Anxiety Stress Scale Short Form (DASS-21). Originally developed in English in its 42-item long version by Lovibond & Lovibond (Lovibond & Lovibond, 1995; Lovibond, 1995) and, in its 21-item short version (DASS-21) by Lovibond and Lovibond (Lovibond, 1995). We use the short version in Spanish validated by Bados, Solanas & Andrés. The questionnaire is composed of three 7-item subscales that assess depression (*DASS-21-D*), anxiety (*DASS-21-A*), and stress (*DASS-21-S*). Regarding to internal reliability, both spanish versions show good values, with a Cronbach's α for the 3 subscales of DASS-21 of 0.84, 0.70 and 0.82 respectively (Bados et al., 2005). It has a 4-point (0-3) Likert-type response format.

Athens Insomnia Scale Brief Five-item Version (AIS-5). We used the 5-item Spanish version of this scale validated by Gómez-Benito, Ruiz & Guilera, developed originally in English by Soldatos, Dikeos & Paparrigopoulos (Soldatos et al., 2000). It is a fast, flexible way of quantifying problems in sleeping (Nenclares Portocarrero & Jiménez-Genchi, 2005). The 5-item version is recommended to identify problems in both the quantity and the quality of sleep in the general population, while the 8-item full version is mainly used in clinical settings (Ruiz, 2007). The internal consistency of the spanish version of 5 items is of a 0.79 Cronbach's α (Gómez-Benito et al., 2011). It has a 4-point (0-3) Likert-type response format. Higher scores on the scale indicate greater difficulties in sleeping.

2.3 Study design and data analysis

For the first study objective, we have grouped the players according to their chess strength, measured by the international ranking (Elo FIDE), which is the objective measure used by the International Chess Federation (FIDE, *Fédération Internationale des Échecs*) to establish the chess strength of a chess player, in the following way:

Type ELO$_1$: **GMs & IMs** (≥ 2400 points): players with an international rating equivalent to the title of Grand Master (GM ≥ 2500 points) and International Master (IM ≥ 2400 points); **Masters** (≥ 2200 to 2399 points): players with between 2200 and 2399 rating points, with the level of FIDE Master (FM; needs to have

reached 2300 international rating points at some time) and Candidate Master (CM; needs to have reached 2200 points at some time); **Aspiring masters** (≥ 2000 to 2199 points): players with a rating of between 2000 and 2199 points; **Level A amateurs** (≥ 1800 to 1999 points): players with a rating of between 1800 and 1999 points; and **Level B amateurs** (<1800 points and no rating): players with a rating below 1800 points and without an international rating.

Type ELO$_2$: **GMs, IMs & FMs** (≥ 2300 points): players with a rating equivalent to the titles GM, IM and FM; **Experts** (≥ 2100 to 2299 points): players with a rating of between 2100 and 2299 points; **Level 1 amateurs** (≥ 2000 to 2099 points): players with between 2000 and 2099 rating points; **Level A amateurs** (≥ 1800 to 1999 points): players with between 1800 and 1999 rating points; and **Level B amateurs** (<1800 points and without a rating): players with a rating below 1800 points and without an international rating.

Type ELO$_3$: we have grouped the players into two groups, those with an international rating of 2000 points or more (≥2000) and those with a rating below this figure or with no rating (≥0 to 1999). In the first two types (ELO$_1$ and ELO$_2$), we have maintained the level of sporting coherence, while in the ELO$_3$ type we have grouped the players based on having reached the psychological level of 2000 rating points or not, and so the logic of the type from a strictly chess point of view is not as strong as in the first two types (Seguí-Urbaneja et al., 2020).

Regarding with the study of the second objective, chess players have been divided into 3 groups according to their mindfulness practice: less than 1 year, between 1 and 5 years, and more than 5 years In order to evaluate the first and second objectives.

We carried out Student's t-test for independent samples with the aim of finding out whether there were significant differences between mean values of mindfulness, self-compassion, depression, anxiety and stress, and sleeping difficulties by the categorial variables of chess strength and years practicing mindfulness of chess players. The third objective, which are the relationships in Figure 1, is analyzed using structural equation modeling (Kaplan, 2008), with Mplus 7. In order to determine linear relationships on the factor loading of the latent constructs SCS-SF and DASS-21, confirmatory factor analysis (Brown, 2006) as the measurement part of a structural equation modeling, is carried out. Maximum Likelihood Robust (MLR) estimator was used to estimate the structural model.

2.4 Procedure

A cross-sectional study was carried out based on the responses given to a battery of self-administered questionnaires applied online. The link to access the questionnaires was provided by the Catalan Chess Federation in the form of an email to affiliated clubs whose email they had, and later included on a chess platform widely used in Catalonia (ajedreznd.com) and also sent by email and/or other media to clubs and players as a way of increasing the number of responses. The data was collected anonymously, and their statistical processing was carried out in an aggregated and confidential way.

3. RESULTS

To be able to establish the relevance and, where pertinent, the differences between the levels of the psychological variables considered in players of different chess strength, we first established three player classifications according to their international ranking (Elo FIDE), as shown and set out in the study design and data analysis section and in the first column of Table 1. Although only in the ELO_3 typology significant differences 95% were found for the subscale *over-identification* (*Oi*), corresponding to the mindfulness facet (*SCSsf-M*) of the self-compassion scale (SCS-SF), it is thought to be interesting to observe than in the ELO_1 typology (see the first part of Table 1) such subscale presented increasing average values in the groups of amateurs from lower to higher ratings (level B and A groups of amateurs, and aspiring masters) and decreasing average values in the groups with higher ratings (masters and GMs & IMs), even though their level was still higher than that of the levels A and B amateurs. The fact of taking this result into consideration is because the trend it shows is the same as that observed in the other two types, as we will now see.

Table 1. Relation between ELO typologies and psychological variables

Type ELO_1	**Subescale**	**Mean (SD)**	**F**	**p-value**
≥2400 (GMs & IMs) (n=6)	Over-identification (Oi)	3.166 (0.93)	1.882	0,118
≥2200 a 2399 (Masters) (n=16)		3.281 (1.03)		
≥2000 a 2199 (Aspiring masters) (n=17)		3.617 (0.83)		
≥1800 a 1999 (Level A amateurs) (n=31)		3.032 (1.00)		
<1800 (Level B amateurs) (n=53)		2.858 (1.13)		
Type ELO_2	**Subescale**	**Mean (SD)**	**F**	**p-value**
≥2300 (GMs, IMs & FMs) (n=11)	Over-identification (Oi)	3.090 (0.86)	1.105	0.105
≥2100 a 2299 (Experts) (n=16)		3.593 (1.02)		
≥2000 a 2099 (Level 1 amateurs) (n=12)		3.458 (0.89)		
≥1800 a 1999 (Level A amateurs) (n=31)		3.032 (1.00)		
<1800 (Level B amateurs) (n=53)		2.858 (1.13)		
Type ELO_3	**Subscale**	**Mean (SD)**	**F**	**p-value**
≥2000 (n=39)	Common humanity (Ch)	2.846 (0.91)	2.860	0.093
≥0 a 1999 (n=84)		3,136 (0,87)		
≥2000 (n=39)	Over-identification (Oi)	3.410 (0.93)	5.820	0.017
≥0 a 1999 (n=84)		2.922 (1.08)		

For type ELO_2 (see the second part of Table 1), we found the same pattern in the same subscale (*Oi*), the scores for which increased in line with the rating of the established groups, except for the group with the highest rating (GMs, IMs & FMs), the scores for whom decreased and were much nearer the level of the A and B amateurs, although remaining slightly above them.

The results obtained for this type strengthen the observed trend for the previous type (ELO_1), reaffirming that *Oi* increases up to a certain level of rating (experts, in this case) and decreases once it reaches this level, albeit remaining above the scores of the level A and B amateurs. A pattern where Oi increases up to a certain rating level, in this case, experts, and then decreases beyond that level. Additionally, it mentions that even after the decrease, Oi remains higher than the scores of level A and B amateurs.

Regarding type ELO_3 (see the third part of Table 1), we found significant differences in the subscales of *common humanity* (*Ch*) (p=0.093), which belong to the facet with the same name (*SCSsf-CH*), and also once again in the subscale *Oi* (p=0.017).

Both on the SCS-SF scale. In the first subscale (*Ch*), the score was higher for the group of lower rated players (≥0 to 1999) than for the group of higher rated players (≥2000), while the situation was reversed in the second subscale (*Oi*). Regarding the relationships between the years practicing mindfulness and the constructs considered, based on the sociodemographic characteristics of the sample (see Table A1 in Appendix 1).

We found a significant relation between the chess players that practice mindfulness, meditation, yoga, Pilates or another relaxation technique -from now on referred to as mindfulness and similar practices-, and those that do not and some of the constructs used in the study. In relation to the stress subscale (*DASS-21-S*), we found a higher mean value in the practitioners compared with the non-practitioners (see the first part of Table 2), a result which would appear to be counter intuitive.

However, when we increase the level of detail of the analysis to include the groups depending on the number of years of practice (<1, 1-5, >5), we found that the previous relationship was not significant but that there were significant differences in seven constructs, all with similar patterns of behavior. In the subscale PHLM-*Aw*, the three facets (*SCSsf-SK*, *SCSsf-CH* and *SCSsf-M*), and the SCS-SF construct,

Those that had practiced mindfulness or similar for more than 5 years had higher average scores, while those that did not practice mindfulness had lower average scores, even though their scores were higher than those of the players that had been practicing for between 1 and 5 years and those that had been practicing for less than 1 year, who all had lower average scores in all the cases. In the subscale *DASS-21-D* and the DASS-21 construct, those that had practiced mindfulness for more than 5 years presented lower average scores, while those that did not practice had higher scores than them, although they were lower than those that had practiced for between 1 and 5 years and for less than 1 year, who presented higher average scores (see the second part of Table 2).

Table 2. Relation between psychological variables and mindfulness practice

At an aggregate level					
Instrument	**Practice mindfulness**	**n**	**Mean (SD)**	**t**	**p-value**
DASS-21-S	Yes	20	7.300 (5.25)	2.103	0.046
	No	103	4.699 (3.92)		
Depending on the years of practice					
Instrument	**Practice mindfulness**	**n**	**Mean (SD)**	**F**	**p-value**
PHLMS-Aw	>5 years	14	40.286 (4.89)	3.091	0.030
	1-5 years	10	34.000 (5.45)		
	<1 year	15	33.800 (6.39)		
	No	84	35.607 (6.66)		
SCSsf-SK	>5 years	14	7.571 (1.84)	2.960	0.035
	1-5 years	10	6.050 (1.36)		
	<1 year	15	6.433 (1.52)		
	No	84	6.435 (1.35)		
SCSsf-CH	>5 years	14	7.214 (0.97)	4.381	0.006
	1-5 years	10	5.350 (1.51)		
	<1 year	15	5.767 (1.93)		
	No	84	6.524 (1.40)		
SCSsf-M	>5 years	14	7.500 (1.31)	2.826	0.042
	1-5 years	10	5.850 (1.43)		
	<1 year	15	6.267 (2.13)		
	No	84	6.940 (1.54)		
SCS-SF	>5 years	14	22.286 (3.67)	4.154	0.008
	1-5 years	10	17.250 (3.78)		
	<1 year	15	18.467 (4.88)		
	No	84	19.899 (3.58)		
DASS-21-D	>5 years	14	3.857 (3.84)	5.153	0.002
	1-5 years	10	9.100 (5.19)		
	<1 year	15	6.867 (4.96)		
	No	84	4.548 (3.76)		
DASS-21	>5 years	14	12.429 (10.54)	2.517	0.062
	1-5 years	10	23.200 (9.22)		
	<1 year	15	21.267 (13.77)		
	No	84	16.869 (10.86)		

Legend:

DASS-21: Depression Anxiety Stress Scale Short Form
DASS-21-D: Depression Subscale of DASS-21
DASS-21-S: Stress Subscale of DASS-21
PHLMS: Philadelphia Mindfulness Scale
PHLMS-Aw: Awareness Subscale of PHLMS
SCS-SF: Self-Compassion Scale Short Form
SCSsf-SK: Self-Kindness Facet of SCS-SF
SCSsf-CH: Common Humanity Facet of SCS-SF
SCSsf-M: Mindfulness Facet of SCS-SF

The third objective of the article, concerning to the relationships between the constructs considered, following the conceptual model proposed in Figure 1,

the analysis was carried out with model of structural equation modeling (see Figure 2), where circles identify the latent constructs of SCS-SF and DASS-21, while observed variables are represented as rectangles in the Figure 2.

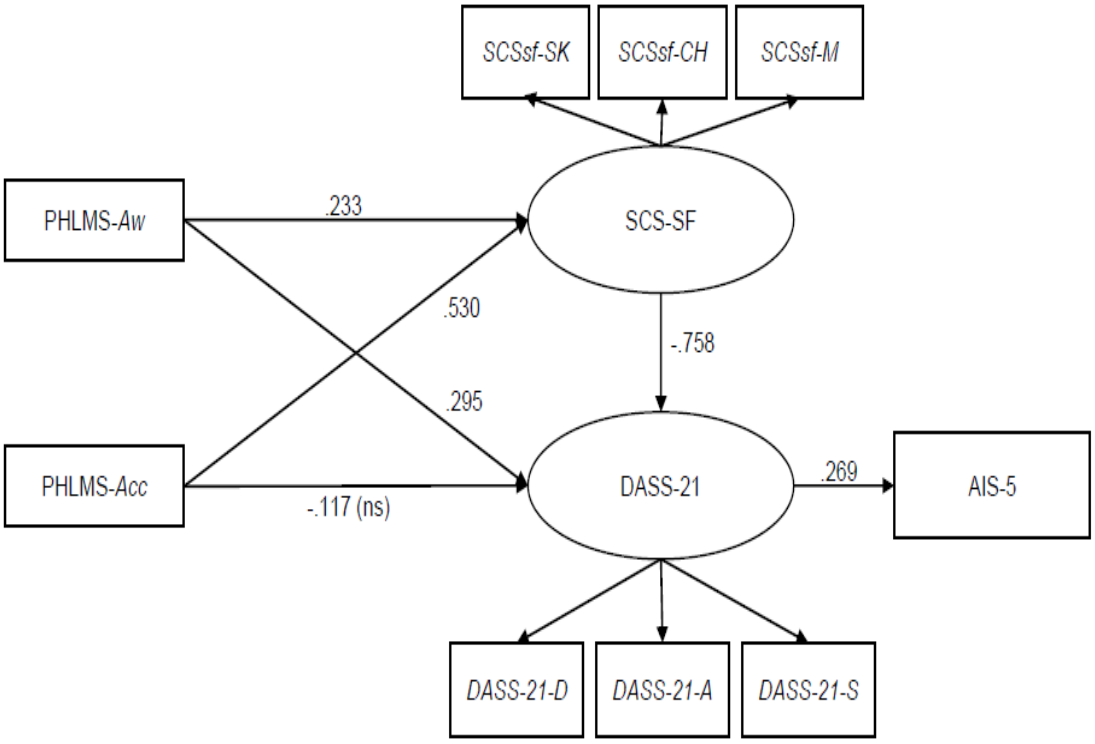

Figure 2. Structural model

Table 3 shows the goodness of fit measures and the model estimation. The following goodness of fit measures were used for the model fit: standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA). SRMR values of 0.08 or lower (Hu & Bentler, 1999) and RMSEA values of 0.06 or lower indicate acceptable fit (Chen, 2007). The comparative fit index (CFI) and Tucker-Lewis index (TLI) are incremental fit indices where values higher than 0.90 for these two indices are an indicator of acceptable model fit (Hu & Bentler, 1999). Therefore, according goodness of fit measures, the estimated model presents an acceptable fit.

Confirmatory factor analysis specifies linear relationships on factor loadings of the latent variables SCS-SF and DASS-21. Table 3 shows that factor loadings for DASS-21 on the depression, anxiety and stress subscales were high (from .78 to .85), as well as factor loadings for SCS-SF on self-kindness (*SCSsf-SK*), common humanity (*SCSsf-CH*) and mindfulness facets (*SCSsf-M*), confirming the one-dimensionality of the latent variables SCS-SF and DASS-21. The bottom part of Table 3 shows the structural relationships among the model variables in Figure 2. PHLMS-*Aw* has a positive and significant effect on SCS-SF and DASS-21, while PHLMS-*Acc* has a positive and significant effect on SCS-SF and a non-significant effect on DASS-21. The effect of SCS-SF has a strong negative relationship with DASS-21, which means that a higher SCS-SF level, a lower level of DASS-21. Finally, the latent variable DASS-21 has a significant and positive effect on AIS-5.

Table 3. Structural equation modelling coefficients

Fit measures	
χ^2; df; p-value	37.437; 23; .029
CFI	.958
TLI	.936
RMSEA	.071
SRMR	.047
Factor Loadings	
SCSsf-SK	.666*
SCSsf-CH	.731*
SCSsf-M	.888*
DASS-21-*D*	.772*
DASS-21-*A*	.795*
DASS-21-*S*	.851*
Relationships	
PHLMS-*Aw* → SCS-SF	.233*
PHLMS-*Acc* → SCS-SF	.530*
PHLMS-*Aw* → DASS-21	.295*
PHLMS-*Acc* → DASS-21	-117
SCS-SF → DASS-21	-.758*
DASS-21→ AIS-5	.269*

*p-value<.05

Legend:

DASS-21: Depression Anxiety Stress Scale Short Form
- DASS-21-*D*: Depression Subscale of DASS-21
- DASS-21-*A*: Anxiety Subscale of DASS-21
- DASS-21-*S*: Stress Subscale of DASS-21

SCS-SF: Self-Compassion Scale Short Form
- *SCSsf-SK*: Self-Kindness Facet of SCS-SF
- *SCSsf-CH*: Common Humanity Facet of SCS-SF
- *SCSsf-M*: Mindfulness Facet of SCS-SF

PHLMS-*Aw*: Awareness Subscale of PHLMS

PHLMS-*Acc*: Acceptance Subscale of PHLMS

AIS-5: Athens Insomnia Scale

4. DISCUSSION

The patterns found among the scores of the constructs studied and the players of different rating levels indicate first that the level of over-identification with painful thoughts and feelings is accentuated among average level players (rating between 2000 and 2299), and especially among the members of the group of aspiring masters (rating between 2000 and 2199), decreasing once again among the higher rated groups, leading us to think that those in the average level groups who are mainly not professional chess players and need good results to be able to become chess professional worry more about results.

Notably, there was some significant difference in the subscale of *over-identification*, belonging to the facet of mindfulness of the self-compassion construct, while no significant difference was found in either of the two subscales of the construct of mindfulness. A plausible explanation for this result is the fact

that the mindfulness included in self-compassion has a more limited scope than mindfulness in general, given that the former refers only to awareness of thoughts and negative feelings, while the latter (mindfulness in general) considers also positive and neutral experiences.

Furthermore, the lower score for common humanity among masters, aspiring masters, and level 1 amateurs than among lower level amateurs could indicate greater isolation and self-absorption in the first group in relation to adverse results as opposed to more understanding of bad results among the group of lower level amateurs.

Lastly, the significant relationships found between the years of practice of mindfulness or similar practices and awareness, self-compassion, depression, and depression-anxiety-stress construct, reflect the improvements in all these variables in players that have practiced for 5 years and more. Furthermore, the relations found show lower scores (in awareness and self-compassion) or higher scores (in depression, and depression-anxiety-stress construct) on chess players that have been practice for less than 5 years related with players that did not practice mindfulness (Alexandre et al., 2018).

This apparent paradox could be explained by the consubstantial limitation of self-reports measures, to the effect that they are based on subjective perceptions that can compromise the validity of the measurement, and include experienced and non-experienced meditators' different interpretations of the items to the existence of biases in the responses of new meditators (Grossman, 2008, 2011; Sauer et al., 2013).

We are referring to a change in the subjective perception of those that practice mindfulness depending on the years of practice and the change in the internal point of view produced by the experience, causing the phenomenon known as *shifting baseline* or *response shift* in quality of life research (Güthlin, 2004; Oort et al., 2009; Sauer et al., 2013) (Soler, 2014).

Regarding the relationships in the model, we found that the two mindfulness subscales (PHLMS-*Aw* and PHLMS-*Acc*) not correlated, it reinforces the existing evidence shown in both in the original PHLMS scale validation and in non-clinical samples (Cardaciotto et al., 2008; Siegling & Petrides, 2014) (Tejedor et al., 2014).

Both subscales show a significant direct relationship with the total SCS-SF, while in a previous study such relationship was only found with the PHLMS-*Acc* subscale (Alvear Morón, 2016). On the other hand, the PHLMS-*Aw* subscale shows a significant direct effect with the DASS-21 latent variable, while the PHLMS-*Acc* present a non-significant effect on DASS-21.

PHLMS-*Aw* shows a significant positive effect with both SCS-SF and DASS-21. This can be explained because for the mere fact of being aware of what is happening at the present moment, it does not generate a change in the level of DASS-21 construct. In order to reduce it, awareness is necessary, but also is necessary that we have a self-kind behavior, that we are aware that what happens to us also happens to others (pain is inherent to human nature), and

that we shouldn't be repetitive or over-identifying with negative emotions. In other words, awareness must pass a self-compassion filter, since, without it, it only allows us to identify our negative emotions, but it does not make them diminish.

In relation with PHLMS-*Acc*, it has already been seen that presents a significant positive relationship with SCS-SF, but non-significant effect on DASS-21. From this finding, it might be derived that, when SCS-SF is taken as a mediator variable, the relationship between PHLMS-*Acc* and DASS-21 is better explained than direct relation between PHLMS-*Acc* and DASS-21. Academic literature seems to support this explanation, since acceptance, despite being a relevant facet in mindfulness, it is a concept closer to compassion than to mindfulness itself (Garcia-Campayo et al., 2014).

Furthermore, in intervention studies, self-compassion was often shown to be key element in terms of explanatory mechanisms of mindfulness training, even more than the measures of mindfulness itself. See, for example, Kuyken et al. or Evans et al. In order to emphasize the relationship between compassion and acceptance, it can be mentioned that both compassion and equanimity (Evans et al., 2018; Kuyken et al., 2010), that is the highest form of acceptance, are Brahma viharas, they develop sequentially and they are considered two of the four sublime emotions according to Buddhism.

Regarding SCS-SF construct, it shows a strong negative and significant relationship with DASS-21, made up for depression, anxiety and stress subscales, and SCS-SF is considered as a mediating variable between mindfulness and DASS-21. Finally, DASS-21 shows a positive and significant effect on AIS-5. Both results reinforce the previous evidence regarding the relationships between these variables.

However, neither the mindfulness nor self-compassion constructs show a significant direct effect on sleep difficulties (AIS-5), but rather an indirect effect through DASS-21.

5. CONCLUSIONS

The results obtained provide evidence of the differential effect of mindfulness and self-compassion in terms of over-identification with negative internal states and common humanity in chess players of different chess strength, and especially among medium level players (aspiring masters, experts, and level 1 amateurs). Similarly, a significant relationship was found between the time that the chess players had practiced mindfulness and similar practices and awareness, self-compassion, depression, and depression-anxiety-stress construct, which is consistent with the limitation shown by self-reports due to the fact that they are based on subjective perceptions. Relationships among the constructs are estimated in a structural equation model where the importance of self-compassion in the relationships between mindfulness and DASS-21 has been shown, leading to the conclusion that self-compassion is a necessary construct to reduce the level of DASS-21, since a direct effect of mindfulness to DASS-21 does not bring to the reduction of the level of stress, anxiety and depression. The no-significant correlation between awareness and acceptance scales is also observed, supporting previous research.

6. Limitations and future directions

Regarding the limitations of the study, the first is the small number of responses from chess players with a higher rating. Another limitation related to the years of practice is the fact of having included different but similar techniques under the umbrella of mindfulness, such that we cannot conclude that the results obtained after processing these data are exclusively due to the practice of mindfulness. And last, the fact that no performance indicators were introduced means that we cannot relate the psychological variables considered to the chess players' performance in a quantitative way. For all these reasons, future research with a larger sample and with a greater participation of higher level chess players is required to be able to generalize the results found in this study and to be able to relate the psychological variables with quantitative measures of performance.

We believe that it would also be interesting to carry out interventions with medium ranked chess players using a protocol that includes both mindfulness and self-compassion, given that they are mutually reinforcing constructs according to both previous evidence and the evidence found in this study.

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APPENDIX 1

Table A1 Sociodemographic characteristics of the study sample (n=123)

Characteristic	Value
Age (years)	
Mean (SD)	48.08 (13.99)
Range (min.-max.)	21-74
Sex, n (%)	
Man	116 (94.3%)
Woman	7 (5.7%)
Children, n (%)	
More than one	44 (35.8%)
One	26 (21.1%)
None	53 (43.1%)
Highest level of study reached, n (%)	
University	81 (65.9%)
Non-university higher education	19 (15.4%)
Secondary school	16 (13.0%)
Primary school	7 (5.7%)
Current residence, n (%)	
Catalonia	119 (96.7%)
Rest of the Spanish state	2 (1.6%)
Other EU countries	1 (0.8%)
Outside the EU	1 (0.8%)
International rating of the chess player (ELO FIDE) May 2019	
Average (SD)	1843.28 (375.874)
Range (min.-max.)	Without ELO-2548
International chess title, n (%)	
International Grandmaster (GM)	3 (2.4%)
International Master (IM)	5 (4.1%)
FIDE Master (FM)	4 (3.3%)
Candidate Master (CM)	2 (1.6%)
None	109 (88.6%)
National chess title, n (%)	
National Master (NM)	1 (0.8%)
Catalan Master (KM)	23 (18.7%)
None	99 (80.5%)

* Practices, but not necessarily regularly.