Influence of health status and loneliness on satisfaction with life, emotional dimensions, and distress in junior handball players

Miroljub Ivanović[1]✉ • **Uglješa Ivanović**[2]

Abstract

This transversal study aimed to examine the contribution of predictor variables of the construct of health status (objective and subjective assessment of health) to the variability of the criteria satisfaction with life, emotional dimensions (positive affect, negative affect), and emotional factor of distress (depression, anxiety, and stress) in junior handball players. The pertinent sample consisted of 132 junior handball players in – Serbian First League. The average age of participants was 18.25 ± 0.90 years of age. The following measuring instruments were used: 1) the Depression, Anxiety, and Stress Scale – DASS-21, 2) De Jong Gierveld Loneliness Scale – DJGLS, 3) the Satisfaction with Life Scale– SWLS, and 4) The Positive and Negative Affect Schedule – PANAS showed satisfactory internal consistency. The conducted multiple regression analysis explained 51% of the proportion variance of the dependent variable satisfaction with life, positive and/or negative affectivity, and cognitive aspect of distress, where the only statistically significant negative predictors were loneliness and subjective assessment of health status. At the same time, when it comes to the assessment of loneliness in adolescents, these independent variables achieved significant interaction with the subjective assessment of health. This would mean that handball players, who subjectively assess their health as bad, and feel lonelier. On the other hand, the regression model did not confirm the role of the predictor variable objective assessment of health status and loneliness. This regression study has contributed to the existing literature and empirical data on the significance of the rarely explored relations between the constructs of health and well-being in the adolescent sports population. Theoretical contributions and practical implications for future research were also discussed.

Keywords handball • adolescents • assessment of health • positive affect • negative affect.

✉ miroljub.ivanovic@gmail.com

[1] Serbian Academy of Innovation Sciences, Belgrade, Serbia

[2] Telecom Serbia, a. d. Belgrade, Serbia

Introduction

Today, in the days of positive psychology, the constructs: (1) subjective and objective assessment of health status, (2) loneliness, (3) satisfaction with life, (4) emotional states – positive and negative affect, and (5) distress are the subject of empirical studies of many sociologists, psychologists, and scientists from other areas. The results of the majority of the research show that adolescents' subjective assessment of health status compared to the objective assessment of health status is a more relevant determinant of organic disease (Kleppang et al., 2020; Suárez Iglesias et al., 2023; von Rosen et al., 2020). Additionally, the authors who examined the factors which are in interaction with the subjective assessment of health have determined that they correlate significantly to the level of physical and mental inability (Aouani et al., 2019; Cece et al., 2021). Examination of the relationship between the subjective and objective

health status in adolescence is particularly significant for improving the results of the athletes. However, earlier studies have shown that there is a correlation between health and loneliness and pointed out that the results are incompatible. A significant correlation has been determined when the subjective assessment of health status is used for the assessment of health, but it has also been found that the correlation varies when the objective assessment of health status and loneliness are used as indicators (Diener et al., 1999).

The research (Castaldelli-Maia et al., 2019) has determined the increase or stabilization of the positive affect, decrease of the negative effect, and decrease of the level of distress. The research authors (Cutler & Dwyer, 2020) have proven that the factor loneliness is in significant correlation with the health status of athletes. Analyzing the different terms of the construct of loneliness, one can see that they have three mutual components: a) loneliness generates a deficit of social relations, b) the outcome is the person's subjective assessment and it differs from isolation, where an individual can feel lonely even when surrounded by people, and c) loneliness is manifested through negative emotions (Madrigal & Robbins, 2020). The construct of loneliness correlates to the unpleasant feeling that interacts with a lower quality of life and bad health status (Madrigal & Robbins, 2020). The aforementioned authors believe that socially isolated athletes are characterized by loneliness which is, in low intensity, connected to their motivation. In their research, Houghton and associates (Houghton et al., 2018) have found that loneliness is the main generator of depression in adolescents. Additionally, loneliness has manifested itself as a determinant of bad health status and increased stress (Suh-Ting et al., 2022).

The overview of the available research published in the past few decades clearly shows that there is an increase in empirical studies which deal with the interaction between loneliness and health status in adolescence. However, even with all that, the influence of the constructs of health status and loneliness on emotional dimensions – positive affect and negative affect, and psychological facto distress has not been explored enough, especially within the area of sports. Therefore, this research aims to examine the influence of objective and subjective health status and loneliness on the affective components (positive affect and negative affect) and the latent dimension of distress.

An alternative hypothesis (H) has been formulated following the theoretical assumptions, results of the earlier studies, and the aim of the research: It is assumed that the independent variables loneliness and subjective assessment of health status will significantly contribute to the variance of the independent variables of the affective components and the cognitive aspect of overcoming in an adolescent sports population.

This research gives contribution to a better understanding of the prediction of the emotional aspect of overcoming (positive affect and negative affect) and psychological factor of distress based on the subjective assessment of health and loneliness in handball players aged 17 to 20. The theoretical contribution of this model means the integration of the existing knowledge on the relationship between loneliness, objective and subjective health, and emotional dimensions. Additionally, the results of this research can give a contribution to formulating practical implications for coaches and parents of young children, all to create a system of psychological support for adolescent athletes.

Method

Participants

The pertinent sample included the participants (N=132) from four handball clubs of the First league – west, Serbia: HC "Metalac" (Valjevo), HC "Mačva" (Bogatić), HC "Karađorđe" (Topola), and SPD "Radnički" (Kragujevac). Their age ranged from 17 to 21 years. The average age of the juniors was 18.25 ± 2.20 years. Adolescents have been practicing handball for a year and a half to five years. On average, they started training at (M age=14.08, SD=2.16 years). The athletes included in the research were in good health and had no health issues for at least three months before taking part in this research.

The participants were explained the aim of the research before filling in the questionnaires, they were told that participation is voluntary and that they could quit at any time. The process lasted approximately 45 minutes. Before the beginning of the research, the participants gave informed consent (to preserve their identity they only gave their initials) which guarantees anonymity and that data would be used only for scientific purposes. Parental consent was acquired for every participant under 18. The research was approved by the ethics committee of the Serbian Academy of Innovation Sciences from Belgrade. The research was conducted during regular handball practice in February 2023.

Instruments

Objective assessment of health

The objective assessment of health was performed using the standardized results on the eleven-item assessment of health questionnaire where the participants gave answers regarding 11 chronic diseases and disorders, for example, high blood pressure, diabetes, and eye disorders such as cataracts or glaucoma. With the aim of a higher score signaling objectively better health, the data was recorded in a way that the values of the variables show the sum of those diseases from which the participant does not suffer. The list of diseases and disorders was created following the findings on the most common and characteristic illnesses that older people suffer from (WHO, 2012).

Subjective assessment of health

Subjective assessment of health was manifested through the standardized results of the one-item scale where participants answered one question: "How would you assess your current health status?". The participants chose the answer on a four-point scale ranging from "bad" to "excellent", where a higher value meant a better subjective assessment of one's health.

Depression, Anxiety, and Stress Scale (DASS-21; Gavrilov-Jerković, Žuljević, & Brdarić, 2014)

DASS-21 contains 21 claims which participants use to assess the frequency of the intensity of three emotional states: depression (for example, "I felt sad and pathetic"), anxiety (for example, "I've noticed I've been having dry mouth"), and stress (for example, "It was hard for me to relax"), where each of the subscales contains seven items.

Depression relates to bad mood, motivation, and self-esteem, anxiety to psychological excitement, panic and fear, and stress which is directed towards tension. The participant assesses the item on a scale by scoring (from 0 – "not at all" to 3 – "mostly or almost always") how often during the past week he or she experienced a state described in a claim. The score for each subscale ranges from 0 to 21 and is presented as the sum of the results obtained for the 7 items of a subscale. The results of each subscale can be classified into four states: normal state, mild, moderate, and severe state (of depression, stress, or anxiety).

The reliability (Cronbach's Alpha) of DASS-21 for the subscale depression is $\alpha=0.88$, for the subscale anxiety $\alpha=0.90$, and the subscale stress $\alpha=0.89$, while the coefficient of internal consistency for the entire scale is $\alpha = 0.90$. With interpreting the consistency, a value over 0.70 is considered an acceptable value of the α coefficient (Field, 2009), which means that the measuring instruments can be used for the assessment of the three examined dimensions.

De Jong Gierveld Loneliness Scale (DJGLS; de Jong Gierveld & Kamphuis, 1985)

DJGLS contains 11 items that are used to assess the components of loneliness: emotional and social. On a three-point scale, the participants are supposed to select to which degree an item refers to them ("yes", "maybe" or "no"). Examples of items: "I feel empty" and "I miss the presence of other people around me". The confirmatory factor analysis confirmed the existence of two latent dimensions: (a) emotional loneliness and (b) social loneliness. The internal consistency, Cronbach's Alpha, for the entire scale was satisfactory and was $\alpha=0.86$.

Satisfaction with Life Scale (SWLS; Diener et al, 1985)

SWLF includes five items that refer to satisfaction with life. The participant's task was to assess to which degree the items refer to them and their life. The assessment was done using a Likert-type scale (from 0 = completely dissatisfied to 10 = completely satisfied). A total score is presented as the sum of all scores on each item. The measuring instrument used has satisfactory internal consistency ($\alpha=0.90$).

The Positive and Negative Affect Schedule (PANAS; Mihić et al., 2014)

PANAS consists of two 10-item scales that measure positive or negative affect. The positive affect schedule consists of the following subscales – self-esteem, joy, and alertness, and the negative affect schedule contains the scales – fear, self-loathing, and hostility. Participants' task was to assess on a five-point Likert-type scale to which degree each item describes their mood in the last couple of days (from 1 = very little or not at all to 5 = a lot, very much). The coefficient of internal consistency was expressed through Cronbach's Alpha and for the positive positive affect schedule was ($\alpha=0.85$), and for the negative affect schedule was ($\alpha=0.88$) which points to satisfactory reliability.

Data processing

The statistical methods of descriptive statistics, the Pearson correlation coefficient, and hierarchical regression analysis were used in this research. The acquired data were analyzed on $\alpha \leq .05$ Statistics software IBM SPSS 23.

Results

The main descriptive statistic parameters of the analyzed manifest variables in this research that include the entire sample are shown in Table 1.

Table 1. Descriptive parameters of the analyzed variables of the scales and questionnaires (PARQ, FACES II, FQQ, IPA-R, and RSES)

Variable	M	SD	Sk	Ku	Sk SE	KuSe	K-s
Objective assessment of health status	8.98	1.19	0.53	0.72	0.14	0.35	0.27
Satisfaction with life	6.10	1,86	0.46	0.66	0.14	0.35	0.83
Positive affect	15.08	3,25	0.12	0.23	0.14	0.35	0.77
Negative affect	7.05	3.01	0.25	0.19	0.14	0.35	3.60
Distress	14.98	10.03	0.30	0.31	0.14	0.35	4.10
Loneliness	16.67	5.01	0.07	0.14	0.14	0.35	0.90

Note: M – Mean; SD – Standard deviation; SK – skewness, Ku – kurtosis, SkSE – Standard error of skewness; KuSE – Standard error of kurtosis.

Taking an insight into the matrix of the descriptive indicators, one can see the maximum mean values of handball juniors which show that on average they surfer from approximately two conditions, and that they view their health status as satisfactory. It means that they are generally very satisfied with life, perceives more positive than negative emotions, and therefore possess a low level of emotional distress. The results of the Kolmogorov–Smirnov test for normality of data distribution and the coefficients of skewness and kurtosis are within the normal range, with values between +-1 (Demir, 2022). That means that there are no statistically significant distribution scores variations from the Gaussian curve, which is necessary for conducting further parametric statistical analyses.

Correlational analysis was conducted to define the linear connection between the manifest variables (Table 2).

Table 2. Intercorrelations between the variables used in the research

Variable	1.	2.	3.	4.	5.	6.
1. Objective assessment of health status		0.42	0.17	0.32	-0.19	-0.40
2. Satisfaction with life			0.18	0.27	0.23	-0.19
3. Positive affect				0.50	0.42	-0.38
4. Negative affect						
5. Distress						0.69
6. Loneliness						

The Pearson correlation coefficient calculated 21 bivariates of statistically significant interactions of low and moderate intensity that ranged from 0.14 to 0.74. Taking an insight into the matrix of the correlation, one can see that the correlates of the variables are moderately to highly correlated in a positive or negative direction. That means that if an adolescent handball player is objectively and subjectively healthy, he is also happier, more satisfied with life, and therefore perceives a minimum level of psychological distress.

To examine the influence of the predictor variable loneliness on the health status and subjective well-being of participants, the multiple linear regression analysis was conducted in Table 3 (Kim & McCabe, 2022). Before conducting this multivariate method, it had been checked for multicollinearity of data which is an intense correlation between two independent variables. Seeing how the standard criterion of the variance inflation factor, or tolerance coefficient, is satisfactory (VIF: 1.02-1.40; Tolerance: 0.69-0.88), one can conclude that multicollinearity of data is not a problem and so the data processing can be conducted (Cohen et al., 2003).

Table 3. The results of the multiple regression analysis with the objective assessment of health status (as predictor) and satisfaction with life, positive negative affect, and distress (as criteria)

Predictor	Satisfaction with life β(SE)	Positive affect β(SE)	Negative affect β(SE)	Distress β(SE)
Objective assessment of health status	0.09 (0.01)	-0.09 (0.76)	-0.10 (0.09)	-0.19* (0.63)
Loneliness	-0.44** (0.85)	0.29** (0.01)	0.27** (0.46)	0.37** (0.03)
Objective assessment of health status x Loneliness	-0.07 (0.08)	0.05 (0.55)	-0.05 (0.05)	-0.01 (0.14)
ΔR^2	0.00	0.00	0.00	0.00
R (Corrected R^2)	0.39 (0.15)	0.40 (0.13)	0.38 (0.17)	0.43 (0.20)

Note: β – Standardized partial regression coefficient; SE – standard error of estimate of β parameter ΔR^2 – Coefficient of determination – contribution of the added group of predictors to the explained proportion of variance; Corrected R^2 – Coefficient of determination adjusted to the number of independent variables included in the model; *p $\leq$.01 **p $\leq$.05

The insight into the obtained coefficient of multiple correlations, which gives information about the correlation between the criterion and linear combination of predictors, and the coefficient of determination with the information about the percentage of the explained variance shows that there is no linear correlation between the predictor variables health status and loneliness, where the coefficient of determinations shows the unrepresentative of the model and does not enable the prediction of the proportion of the variance of the dependent variables (satisfaction with life, positive affect, negative affect, and distress) based on the dependent variable objective assessment of health status.

Finally, the multiple regression analysis was conducted to examine whether the predictors in subjective assessment of health status contribute to explaining satisfaction with life, positive affect, negative affect, and distress (Table 4). Statistical indicators of collinearity indicate that there is no problem with data multicollinearity. Tolerance indexes range from 0.70 to 0.89, and the variance inflation factors range from 0.99 to 1.48 (Miles, 2014).

Table 4. The results of the multiple regression analysis with the subjective assessment of health status (as predictor) and satisfaction with life, positive affect, negative affect, and distress (as criteria)

Predictor	Satisfaction with life β(SE)	Positive affect β(SE)	Negative affect β(SE)	Distress β(SE)
Subjective assessment of health status	0.15*	-0.13*	0.05	-0.10
Loneliness	-0.29**	-0.32**	-0.28**	0.40**
Subjective assessment of health status x Loneliness	-0.17*	0.19*	-0.05	-0.02
ΔR²	0.05	0.00	0.00	0.00
R (Corrected R²)	0.51 (0.15)	0.40 (0.13)	0.38 (0.17)	0.43 (0.20)

Taking an insight into the regression matrix, one can see that the coefficient of multiple correlations is statistically significant on the level of $p \leq .05$, which indicates that there is a linear connection in the joined action of the group of predictors and criterion variables subjective assessment of health status and satisfaction with life. Total R2 suggests that this kind of predictive model of the included independent variables accounts for 51% of the variance proportion – dependent variable. However, 49% of the residual variability remains unexplained, so it is assumed that loneliness would be better predicted by some other combination of predictor variables – or additional variables should be included in the analysis. In other words, the obtained proportion of the residual variability represents an accidental error that includes also variables that have not been included in this regression model, and that, therefore, decreases the proportion of the unexplained variance of the residual, meaning they influence the examined criterion variable.

So, the negative indicators of the partial standardized regression coefficients of the independent variables loneliness and subjective assessment of health status, with 99% certainty, give the only statistically significant relevant contribution to explaining the variance proportion of the dependent variable satisfaction with life, emotional dimensions – positive affect, negative affect, and psychological factor distress. That means when the value of the beta coefficient in the tested predictor is decreasing, the increase in the values of criterion variables is expected. Furthermore, it means if handball players perceive their subjective health as bad, and feel scared, confused, unhappy, and angry, they will manifest a higher level of satisfaction with life, the cognitive aspect of overcoming, and psychological distress. Based on the obtained regression coefficients, one can conclude that the construct subjective assessment of health status and loneliness is a relevant predictor of the variability of satisfaction with life, emotional states, and factor distress in junior handball players. Therefore, it can be said that there is a statistically significant interaction between the dependent and independent variables and that the tested hypothesis (H) is confirmed because the predictors – loneliness and subjective assessment of health have a statistically significant influence on the criterion – positive and negative emotional states, as well as on the psychological factor distress in junior handball players.

Discussion

Lately, there has been growing interest in examining the relations between loneliness and subjective well-being of junior handball players which has the aim to explore the correlation between the aforementioned constructs. The defined aim is derived from the fact that the increasing number of athletes suffer from chronic illness or other problems, are in some sort of social isolation, and therefore suffer from loneliness. The authors (Chow et al., 2021; Fogaca, 2021) have determined that there is a relevant correlation between the health and well-being of an athlete, as well as between loneliness and health. However, there is also a deficit of research that examines the structure of the relationship between these variables.

Therefore, we come to the question of whether the assessment of health status and the level of loneliness of an athlete influence the level of well-being. The hypothesis has been formulated that junior handball players feel an intense need to belong to a social environment, so they create and keep close and permanent social connections, which means that this need is relevant to the quality of a large number of psychological processes, and there is also the possibility that in adolescence lonely athletes due to stress and decrease of joy find it harder to accept various life difficulties than their peers who feel that they interact well with their social environment (Aron et al., 2019; Chang et al., 2020).

Another interesting thing is the result of the examined sample of handball players where the variables objective and subjective assessment of health are in low and moderate correlation, which is following the research (Achterbergh et al., 2020). That indicates that instead of the number of diseases an athlete objectively suffers from, some other unexamined factor affects the two-dimensional construct of subjective assessment of health, and not the real number of diseases a person suffers from. The findings of the studies on the correlation between health and subjective well-being, where the impact of loneliness is not included in the regression model, point out that health is a statistically significant correlation to all dependent variables, and that the intensity of correlation differs depending on the dependent variable. The regression findings obtained in this research show that the predictor objective assessment of health is in intense interaction with the negative indicators of well-being, or the criteria (negative affectivity and emotional distress). On the other hand, the predictor's subjective assessment of health positively correlates only to positive indicators of well-being (positive affectivity and satisfaction with life). Another interesting finding in this study is that the predictor objective assessment of health has a connection only to affective well-being, while the subjective assessment of health, besides positive affectivity, correlates to the indicator of cognitive well-being. That shows that subjective and objective assessment of the health of athletes does not correlate to their level of satisfaction with life. These findings indicate that health and the absence of disease in old age are relevant determinants of the affective well-being of athletes, meaning that adolescent athletes with minimum health problems manifest lower levels of depression, anxiety, and stress, so they more frequently perceive pleasant feelings, while they do not often experience unpleasant feelings.

Additionally, if athletes subjectively see themselves as healthy, they more frequently manifest positive emotional experiences and have a higher level of satisfaction with life. So, only the subjective assessment of health status is a relevant determinant of cognitive well-being, while the objective assessment of health status turned out not to be a predictor of the cognitive indicator of well-being, in other words despite the objective health status, the participants manifested relatively high level of satisfaction with life.

However, the findings of the research on the relationship between health status and subjective well-being or the effect of feeling lonely, manifest slightly different results because they have shown that it had the most important impact on all the indicators of the assessment of subjective well-being. The obtained findings indicate that the construct loneliness is in principle a latent dimension of satisfactory adjustment, and good adaptation, so separately from health it has a negative influence on well-being in adolescence. The feeling of loneliness also achieves correlational relations with the subjective assessment of health status and independent satisfaction with life. Positive relations between subjective assessment of health status and quality of life exist solely in extremely lonely adolescents. On the other hand, in individuals with minimal loneliness, satisfaction with life is independent of the subjective assessment of health status. It means that extremely lonely individuals with bad assessments of subjective health express a lower level of satisfaction with life. However, with adolescents who are not lonely, there is no correlation between their subjective assessment of health and satisfaction with life. Such results are the following results which emphasize the harm loneliness can cause to adolescents' health (Csikszentmihalyi, 2021; Šantl et al., 2022; Twenge et al., 2021). An elevated level of stress is an expected process that causes the increased loneliness to negatively reflect on the correlation between health and well-being, which is in correlation to extreme loneliness and general health (Woolfe, 2019). Lonely people tend to assess stressful situations by comparing themselves to individuals who are not lonely. The obtained results are at the same time following the results which prove the negative function of loneliness in adolescence, but they also allow the possibility of realizing further research on the impact of social support as a beneficial indirect feeling of loneliness in achieving health status and subjective well-being in adolescence.

Part of this research deals with the complex function of the examined occurrences of satisfaction in the lives of adolescent athletes. This research is also one of the rare ones that examine the relations between health, subjective well-being, and loneliness, and where the results are the addition that can be used to better identify relatively inconsistent findings on the correlation between health status and subjective well-being of junior handball players. Its contribution is also manifested through the indication that there is a need for the examined variables' health and subjective well-being not to be regarded as single-factor constructs but that their complexity and multidimensionality should be taken into account during the research process. That the constructs of health and subjective well-being should not be analyzed as single-factor constructs confirm this empirical study, which indicates that there are various correlations of partial indicators between these two phenomena. The findings obtained in this research are informative and represent the starting point for further research, and the basis for improving the lives of adolescent athletes. They also offer the conditions for reaching conclusions about the examined relations among Serbian junior handball players, but it is more realistic to conclude by using a bigger sample of participants.

References

Aouani, H., Slimani, M., Bragazzi, N. L., Hamrouni, S., & Elloumi, M. (2019). A preliminary validation of the Arabic version of the Profile of Emotional Competence questionnaire among Tunisian adolescent athletes and nonathletes: Insights and implications for sports psychology. *Psychology Research and Behavior Management*, *12*, 155–167. https://doi.org/10.2147/PRBM.S188481

Aron, C. M., Harvey, S., Hainline, B., Hitchcock, M. E., & Reardon, C. L. (2019). Post-Traumatic stress disorder (PTSD) and other trauma-related mental disorders in elite athletes: a narrative review. *British journal of sports medicine, 53*(12), 779–784.

Achterbergh, L., Pitman, A., Birken, M., Pearce, E., Sno, H., & Johnson, S. (2020). The experience of loneliness among young people with depression: A qualitative meta-synthesis of the literature. *BMC Psychiatry*, *20*(1), 415. https://doi.org/10.1186/s12888-020-02818-3

Cece, V., Guillet-Descas, E., Brenas, M., & Martinent, G. (2021). The role of dispositional emotion regulation strategies on the longitudinal emotional process and subjective performance during a competitive season. *European Journal of Sport*

Science, *21*(10), 1448–1458. https://doi.org/10.1080/17461391.2020.1862304

Cutler, B. A., & Dwyer, B. (2020). Student-athlete perceptions of stress, support, and seeking mental health services. *Journal of Issues in Intercollegiate Athletics*, *13*, 206–226. http://csrijiia.org/wp-content/uploads/2020/06/RA_2020_10.pdf

Castaldelli-Maia, J. M., Gallinaro, Falcão, R. S., Gouttebarge, V., & Hainline, B .(2019). Mental health symptoms and disorders in elite athletes: a systematic review on cultural influencers and barriers to athletes seeking treatment. *British Journal of Sports Medicine,* *53*(11),707–21. https://bjsm.bmj.com/content/53/11/707

Cohen, J., Cohen, P., West, S. G. & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*, 3rd ed. Lawrence Erlbaum Associates Publishers.

Csikszentmihalyi, M. (2021). Adolescence. Encyclopedia Britannica. Dostupno na: https://www.britannica.com/science/adolescence [8. mart 2023] Chow, G. M., Bird, M. D., Gabana, N. T., Cooper, B. T., & Becker, M. A. S. (2021). A program to reduce stigma toward mental illness and promote mental health literacy and help-seeking in national collegiate athletic association division I student-athletes. *Journal of Clinical Sport Psychology*, *15*(3), 185–205. https://doi.org/10.1123/jcsp.2019-0104

Chang, C., Putukian, M., Aerni, G., Diamond, A., Hong, G., Ingram, Y., & Wolanin, A. (2020). Mental health issues and psychological factors in athletes: Detection, management, effect on performance and prevention: American Medical Society for Sports Medicine Position Statement—Executive Summary. *British Journal of Sports Medicine, 54*(4), 216–220.

De Lise, F., Bacaro, V., & Crocetti, E. (2023). The Social Side of Sleep: A Systematic Review of the Longitudinal Associations between Peer Relationships and Sleep Quality. *International Journal of Environmental Research* and *Public Health*, *20*(3), https://doi.org/10.3390/ijerph20032017

de Jong Gierveld, J., & van Tilburg, T. (2006). A 6-item scale for overall, emotional, and social loneliness: Confirmatory tests on survey data. Research on Aging, 28, 582–598. doi:10.1177/0164027506289723Diener, E., Inglehart, R., & Tay, L. (2013). Theory and validity of life satisfaction measures. Social Indicators Research, 112, 497–527. https://doi.org/10.1007/s11205-012-0076-y

Demir, S. (2022). Comparison of Normality Tests in Terms of Sample Sizes under Different Skewness and Kurtosis Coefficients *International Journal of Assessment Tools in Education, 9*(2), 397–409. DOI: 10.21449/ijate.1101295

Fogaca, J. L. (2021). Combining mental health and performance interventions: Coping and social support for student-athletes. *Journal of Applied Sport*

Psychology, *33*(1), 4–9. https://doi.org/10.1080/10413200.2019.1648326

Field, A. (2009). *Discovering Statistics Using SPSS*. (3rd ed.), London: Sage Publications Ltd.

Houghton, S., Lawrence, D., Hunter, S. C., Rosenberg, M., Zadow, C., Wood L., & Shilton, T. (2018). Reciprocal relationships between trajectories of depressive symptoms and screen media use during adolescence. *Journal* of *Youth* and *Adolescence, 47*(11), 2453–2467. https://doi.org/10.1007/s10964-018-0901-y.

Kim, D. S., & McCabe, C. J. (2022). The partial derivative framework for substantive regression effects. *Psychological Methods, 27*(1), 121–141. https://doi.org/10.1037/met0000440

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. Behaviour Research and Therapy, 33, 335–343. https://doi.org/:10.1016/0005-7967(94)00075-U

Madrigal, L. & Robbins, J. E. (2020). College athlete stress: An examination in United States Collegiate Athletics. *Journal for the Study of Sports and Athletes in Education, 14*(2), 123–139. https://doi.org/10.1080/19357397.2020.1774261

Mihić, LJ., Novović, Z., Čolović, P., & Smederevac, S. (2014). Serbian adaptation of the Positive and Negative Affect Schedule (PANAS): Its facets and second–order structure. *Psihologija, 47*(4), 393–414. doi:10.2298/PSI1404393M

Miles, J. (2014). Tolerance and variance inflation factor. *Wiley StatsRef: Statistics Reference Online*. https://doi.org/10.1002/9781118445112.stat06593

Suárez Iglesias, D., Soto, D., Ayán, C., & Martínez-de-Quel, Óscar. (2023). The impact of Covid-19 on healthy habits and psychological well-being of Chilean female handball players. *E-balonmano.Com:Journal Sports Science*, *19*(1), 1–12.

https://publicaciones.unex.es/index.php/ebalonmano/article/view/2082

Suh-Ting, L., Ying-Hua, H., & Meng-Hua, Y. (2022). The Relationships among Sport Participation Level, Flow Experience, Perceived Health Status and Depression Level of College Students, *International Journal of Environmental Research* and *Public Health,* 20(1), 251 https://doi.org/10.3390/ijerph20010251

Šantl, L., Brajković, L., & Kopilaš, V. (2022). Relationship between nomophobia, various emotional difficulties, and distress factors among students. *European Journal of investigation* in *Health*, *Psychology* and *Education Eur. J. Investig. Health Psychol. Educ.*, *12*, 716–730. https://doi.org/10.3390/ ejihpe12070053

Twenge, J.M., Haidt, J., Blake, A.B., McAllister, C., Lemon, H. & Le Roy, A. (2021). Worldwide increases in adolescent loneliness. Journal of Adolescence, 93, 257–269. https://doi.org/10.1016/j.adolescence.2021.06.006

Von Rosen, P., Olofsson, O., & Annette Heijne, A. (2020). Correlates of health in adolescent elite athletes and adolescents: A cross-sectional study of 1016 adolescents. *European Journal of Sport Science (EJSS), 19(5),* 707–716. https://doi.org/10.1080/17461391.2018.1552721

Woolfe, S. (2019). The Problem of Boredom: A Philosophical Perspective. Dostupno na: https://www.samwoolfe.com/2019/04/the-problem-of-boredom-a-philosophicalperspective.html [9. Mart 2023]

How to cite this article:

APA:	Ivanović, M., & Ivanović, U. (2023). Influence of health status and loneliness on satisfaction with life, emotional dimensions, and distress in junior handball players. Exercise and Quality of Life, 15(1), 27-35. doi:10.31382/eqol.230604
MLA:	Ivanović, Miroljub and Uglješa Ivanović. "Influence of health status and loneliness on satisfaction with life, emotional dimensions, and distress in junior handball players." Exercise and Quality of Life 15.1 (2023): 27-35.
Chicago:	Ivanović, Miroljub, and Uglješa Ivanović. 2023. "Influence of health status and loneliness on satisfaction with life, emotional dimensions, and distress in junior handball players." Exercise and Quality of Life 15 (1): 27-35. doi:10.31382/eqol.230604.