Research Paper

Psychometric Properties of the Persian Version of the Multiple Lifestyle Behaviors Questionnaire and its Measurement During the COVID-19 Outbreak: The Role of Gender and Exercise

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ABSTRACT

Background: This study aimed to assess the psychometric properties of the Persian version of the multiple lifestyle behaviors (MLSB) questionnaire during the COVID-19 outbreak by considering the role of gender and exercise.

Methods: This research population consisted of all Iranian men and women in the age range of 18 to 65 years living in Iran in the summer of 2021. The statistical sample consisted of 299 female (n=225) and male (n=74) Iranian athletes (of team and individual disciplines) and non-athletes selected through a snowball sampling method by sharing the questionnaire on social media networks. This questionnaire includes eight factors: Life satisfaction, mental wellbeing, social participation, mood and feeling, technology use, diet behavior, physical activity, and sleep quality. Confirmatory factor analysis was used to examine the construct validity, and Cronbach's alpha coefficient and split-half coefficient were used to assess reliability. Concurrent validity was also measured using Pearson's correlation coefficient The obtained data were analyzed with SPSS version 23 and AMOS version 22 softwares.

Results: The obtained results showed that all factors of the questionnaire have factorial loading or high correlation with the whole MLSB questionnaire (P<0.001). The correlation between the scores of the questionnaire dimensions ranged from 0.12 to 0.678 (P<0.001) and showed suitable validity. The obtained reliabilities in all dimensions in the questionnaire were over 0.7 and desirable.

Conclusion: In the present study, the psychometric properties of the MLSB questionnaire were assessed for healthy athlete and non-athlete adults, providing desirable reliability and validity. The researchers are suggested to use the Persian version of this questionnaire in the future research and also assess the psychometric properties of the questionnaire for adolescents, people with special diseases, Fields and different skill/sport levels and sport experiences.

Keywords: Psychometrics, Questionnaire, Multiple lifestyles, Gender, COVID-19

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1. Introduction

In 2019, the World Health Organization (WHO) announced COVID-19 as an infectious disease caused by the newly discovered coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. Given the challenge posed by the COVID-19 pandemic to healthcare systems and society, and to reduce the rate of new infections and flattening their contagious curve, most countries implemented the guidelines for mass home quarantine with the highest cases of physical distance and curfew, which is known as one of the most effective measures taken to prevent the prevalence of the disease. However, the weakening of social relationships may cause widespread disruption to daily life and lead to stress for people across the world [2, 3]. Evidence has shown that anxiety, frustration, loss of or sudden increase in appetite, insomnia, depression, mood swings, delusions, fear, sleep disorders, and cases of suicide/domestic violence have become quite common during quarantine [4]. However, the prolonged effect of these limitations on an individual's lifestyle has not been defined. A lifestyle is a set of behavioral patterns and personal habits that emerged in all parts of life. Lifestyle is a multidimensional event [5], including psychological well-being [6], mood [7], life satisfaction [8], social participation [9], physical activity [10], dietary behaviors [11, 12], sleep [13], and technology [14].

The questionnaire is one of the practical instruments for assessing lifestyle factors. Considering lifestyle during the COVID-19 pandemic, some questionnaires have been psychometrically evaluated in Iran. However, these questionnaires have some disadvantages, such as a lack of embracing all dimensions of lifestyle, a lack of country-wide expansion, and a lack of embracing different age and skill levels [15-19]. Since the questionnaires possess adequate psychometric properties for the community for which they have been designed [20], failure to use and collect a comprehensive database on behaviors affecting lifestyle [5], socio-cultural and climatic limitations affecting people's lifestyle in different societies, and the age, skill, and gender limitations [17] in using the existent questionnaires laid the basis for this research.

Considering that individuals' lifestyle has undergone major change during the COVID-19 pandemic due to home quarantines and staying at home for a long time, remote professional activities, and lack of proper social communication [3, 21], and since these changes are evident in men and women due to the difference in the initial level of lifestyle, including poor quality of sleep, weaker social relationships, and higher psychological vulnerability [22], on the other hand, the athletes' lifestyle has undergone fundamental changes with frequent irregularities in the time and type of training and sports competitions [23], showing the necessity of conducting this research. This questionnaire can be used in case of an outbreak of other strains or other conditions leading to lifestyle change or quarantine. At the time of the COVID-19 outbreak, Ammar Achraf et al, (2020) designed a comprehensive questionnaire titled "multiple lifestyle behaviors (MLSB)" which includes eight independent and valid questionnaires. Since MLSB questionnaire is a very comprehensive scale, including a broad age range (18-65 years) for each gender, and has not been so far validated in Iran, the researchers decided to conduct the present study to assess the psychometric properties of the MLSB questionnaire in both male and female athletes and non-athletes and to assess people's lifestyles before and during the COVID-19 pandemic, given the role of gender and exercise.

2. Methods

Research type and population

This is descriptive research. The research population included all Iranian male and female athletes and non-athletes aged 18 to 65 years in the summer of 2021. The statistical sample included 225 women and 74 men who were selected using a snowball sampling method [24] by sharing an online questionnaire. The inclusion criteria included adults of both genders, athletes of all sports disciplines (team and individual disciplines) and non-athletes, access to social media networks, and the ability to use smartphones.

First of all, we asked permission from the questionnaire designer to translate and psychometrically evaluate the questionnaire. Next, the questionnaire was translated from English to Persian, and the items were translated again from Persian to English. After that, two translators investigated the differences between the two questionnaires. In the next step, some persons were interviewed to fully and comprehensively investigate the understandability of Persian items. The online questionnaire was created using Google Forms and shared with participants via WhatsApp. Moreover, full information related to the research was mentioned at the beginning of the questionnaire and the subjects recorded their informed consent electronically in the questionnaire.

Research instrument

The instrument used in the present research is the MLSB questionnaire. The MLSB questionnaire was designed by Ammar Achraf et al. in 2020 and introduced as a unitary questionnaire consisting of lifestyle-related factors. The initial validity and reliability of the questionnaire were examined by the original authors. The reliability of the short form or the new questionnaire adopted by the project steering group was confirmed via experimental research before survey implementation. These brief crisis-oriented questionnaires showed excellent reliability coefficients (r= 0.84–0.96). This questionnaire has been designed to assess well-being through eight independent questionnaires as follows:

Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS): Short Warwick-Edinburgh mental well-being scale (SWEMWBS) was developed and validated in the UK by Tennant et al. (2007). The SWEMWBS included seven positive items scored from never (1 point) to always (5 points). The total scores range from 7 to 35 and higher scores indicate higher positive mental well-being. Based on the scores, the SWEMWBS categories of mental well-being were considered low (7-19.3), medium (20.0-27.0), and high (28.1-35). This questionnaire includes items 14-20 of the original questionnaire (MLSB questionnaire) [25].

Short Mood and Feeling Questionnaire (SMFQ): The short mood and feeling questionnaire (SMFQ) was developed by Costello and Angold. It was designed as a brief screening tool for depression based on thirteen items about mood and feeling. The MFQ is scored by summing up the point values of responses provided to each item (not true=0 point, sometimes true=1 point, true=2 points) with higher scores indicating more severe symptoms of depression. The scores obtained on SMFQ vary between 0 and 26. A total score of 12 or higher may indicate the respondent's depression. This questionnaire constitutes items 35-47 of the original questionnaire (MLSB questionnaire) [26].

Short Life Satisfaction Questionnaire Lockdowns (SLSQL): The short life satisfaction questionnaire lockdowns SLSQL is a short form of satisfaction with life scale (SWLS) designed by Diener et al. (1985) to measure the satisfaction with life as a whole in people. It includes three items that are scored on a seven-point Likert scale (from strongly agree=7 to strongly disagree=1). The total score of this questionnaire corresponds to the sum of the points obtained on three items. The total score of the SLSQ-L ranges from 3 to 21 with 3 indicating that the participant is extremely dissatisfied, 4–6 indicating that the participant is dissatisfied, 7–9 indicating that the participant is slightly dissatisfied, 10–12 indicating that the participant is neutral, 13–15 indicating that the participant is slightly satisfied, 16–18 indicating that the participant is satisfied, and 19–21 indicating that the participant is extremely satisfied. This questionnaire constitutes items 11-13 of the original questionnaire (MLSB questionnaire) [27].

Short Social Participation Questionnaire-Lockdowns (SSPQL): The short social participation questionnaire-lockdowns (SSPQL) is a modified crisis-oriented short form of a questionnaire to assess social participation before and during a lockdown period. The SSPQ-L has been developed based on 18 items of the SPQ. The final SSPQL includes 14 items with five response categories (Never=1 point, rarely=2 points, sometimes=3 points, often=4 points, and all times=5 points) for the 1st 10 items, and yes=5 points/no=1 point for the remaining four items. The total score that can be obtained on the SSPQ-L ranges from 14-70. This questionnaire constitutes items 21-34 of the original questionnaire (MLSB questionnaire) [28].

Short Diet Behaviors Questionnaires Lockdowns (SDBQL): The short diet behaviors questionnaires lockdowns (SDBQL) is a crisis-oriented short-form questionnaire to assess dietary behavior before and during the lockdown period. The SDBQ-L has five items related to unhealthy food, out-of-control eating, snacks between meals, high alcohol consumption, and the number of main meals. The response choices and the scores designated to them are as follows, never=0, sometimes=1, most of the time=2, and always=3. These points were applied to the 1st four items. The scores designated to the 5th item are as follows, 1–2=1, 3=0, 4=1, 5=2, >5=3. The total score obtained on the SDBQ-L ranges from 0 to 15, where 0 indicates no unhealthy dietary behaviors and 15 indicates severely unhealthy dietary behaviors. This questionnaire constitutes items 56-60 of the original questionnaire (MLSB questionnaire) [29].

Pittsburgh Sleep Quality Index (PSQI): The 18-item Pittsburgh sleep quality index (PSQI) was designed in 1988, by Buysse et al. in the psychiatric institute of Pittsburgh. The PSQI assesses sleep quality during 1 month. The 18 items are grouped into 7 components, sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, medication usage, and daily dysfunction. These cases are graded in terms of frequency or severity. The items are scored on a 0–3 Likert scale (0=Not during the last month, 1=Less than once a week, 2=Once

or twice a week, 3=Three times a week or more). The global PSQI components score ranges from 0 to 21 indicating lower or higher sleep quality. This questionnaire constitutes items 62-77 of the original questionnaire (MLSB questionnaire) [30].

International Physical Activity Questionnaire- Short Form (IPAQ-SF): The International physical activity questionnaire-short form (IPAQ-SF) data are summed up in each item (vigorous intensity, moderate intensity, and walking) to estimate the total time spent on physical activity per week. The total weekly physical activity (metabolic equivalents of task [MET]-minute per week) was computed by adding products of the time reported for each item by a MET value specific to each group of physical activity. The sum of original values (original IPAQ) was based on the official guidelines of IPAQ for young and elderly adults (adults 18 to 65 years). Vigorous physical activity: 8.0 METs, moderate physical activity: 4.0 METs, and walking: 3.3 METs. This questionnaire constitutes items 48-54 of the original questionnaire (MLSB questionnaire) [31].

Short Technology-use Behaviors Questionnaire for Lockdowns (STBQL): The short technology-use behaviors questionnaire for lockdowns (STBQL) is a crisis-oriented questionnaire developed to assess the technology-use behavior before and during the lockdown. The STBQL consists of three items related to the technology use behavior for social participation, diet, and physical activity goal. The response options for each item and the point values designated for them are as follows, never=0 (point), rarely=1, sometimes=2, often=3, and all times=4. The total score of this questionnaire ranges from 0-12, where, 0 indicates the absence of digital behavior, and 12 indicates the extensive use of digital solutions by the subject. This questionnaire constitutes item 24 of the social participation questionnaire, item 55 of the physical activity questionnaire, and item 61 of the dietary questionnaire of the original questionnaire (MLSB questionnaire) [32].

Method of analysis

Since this research aimed to examine the validity and reliability of the MLSB questionnaire, the construct validity of the questionnaire was assessed using exploratory and confirmatory factor analyses to measure the validity of this scale. Cronbach's alpha and split-half reliability coefficients were then used to examine reliability. The paired samples t test was used to investigate the difference in the mean scores of the MLSB before and during the COVID-19 outbreak. Moreover, repeated measures analysis of variance (ANOVA) was used to investigate the difference in the MLSB between the male and female, as well as the athletes and non-athletes groups before and during the COVID-19 outbreak. Data were analyzed at the descriptive and inferential levels using SPSS and AMO softwares version 23.

3. Results

The research sample included 225(75.3%) women and 74 (24.7%) men. Of them, 105 people (35.1%) had a master's degree and 102(34.1%) had a bachelor's degree, 48(16.1%) had a high school diploma, 26(8.7%) had an associate's degree, and 18(6%) were below diploma holders.

A total of 147 subjects (49.2%) were married, while 134(44.8%) were single, and 18(6%) were widowed or divorced. A total of 81 subjects (27.1%) were employee, 69(23.1%) were self-employed, 75(25.1%) were student, 33(11%) were housewife, 7(2.3%) were unemployed or decrepit, 8(2.7%) were retired, 10(3.3%) had quitted their work due to the COVID-19 outbreak, and 16(5.4%) have been working in other occupational groups. A total of 275 subjects (92%) were in perfect health, 21(7.1%) had health risk factors, 1(0.3%) had cardiovascular diseases, and 1(0.3%) had physical disability and cognitive disorders. The mean age of the research participants was 34.2±11.28 years.

In the measurement model of the MLSB questionnaire, the normed chi-square index of the model is equal to 2.44, indicating the acceptable status of this index in the model. The value of fit indices of Tucker-Lewis index (TLI), comparative fit index (CFI), the goodness of fit index (GFI), and adjusted goodness of fit index (AGFI) was 0.909, 0.927, 0918, and 0.901, i.e. higher than 0.9, respectively. The value of the parsimonious comparative fit index (PCFI) as the good fit index was 0.673 and over 0.5, which is desirable. The value of root mean squared error of approximation (RMSEA) as the critical total fit index is equal to 0.07, indicating that the model properly fits the data. Moreover, as shown in Figure 1, to investigate the second-order confirmatory factor analysis in the measurement model, all eight factors of the questionnaire, including life satisfaction, mental well-being, social participation, mood and feeling, technology use, diet behavior, physical activity, and sleep quality have factorial loadings or high correlation with the whole MLSB questionnaire and all factorial loadings are higher than 0.3 and significant.

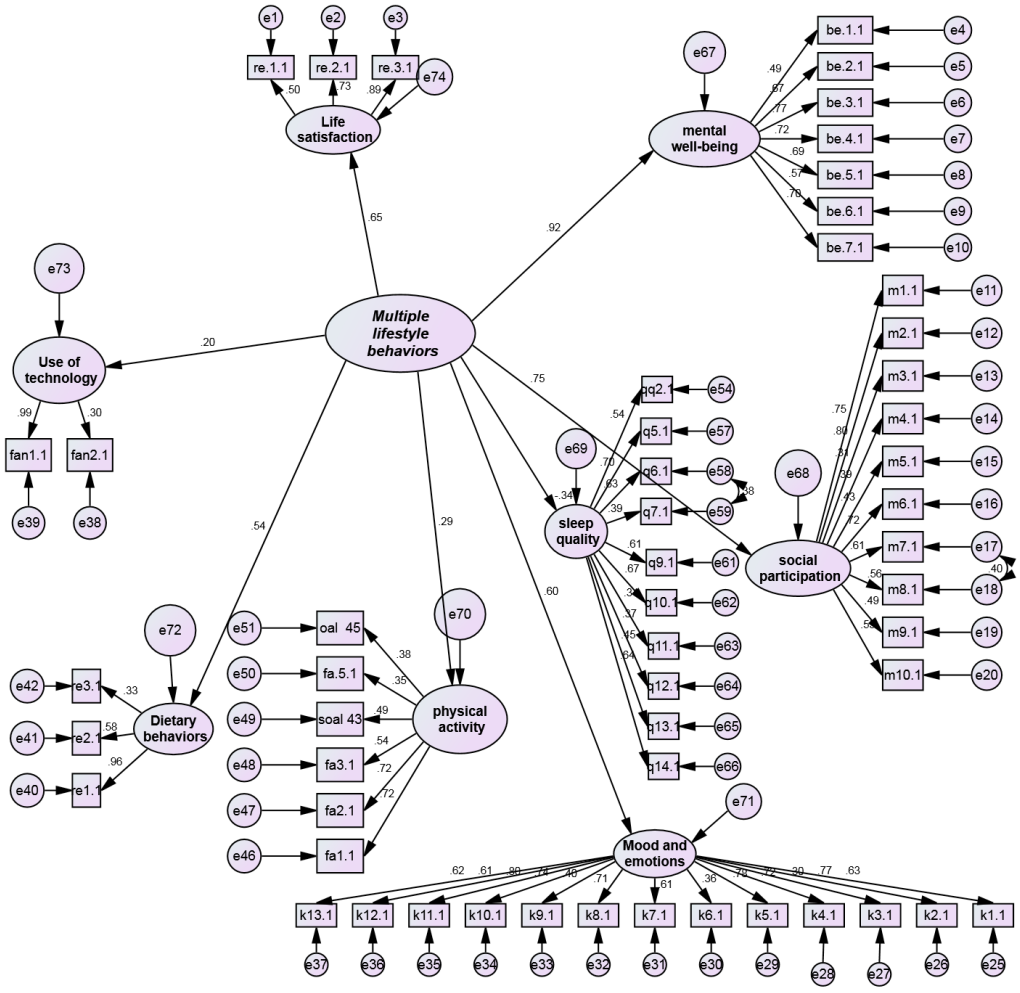

Figure 1. Measurement model for multiple lifestyle behaviors (MLSB) questionnaire

Note: e1-e66 items' measurement errors- e67-e74 model's structural error

Cronbach's alpha reliability of the questionnaire aspects was calculated to be 0.881 for life satisfaction, 0.86 for mental well-being, 0.808 for social participation, 0.878 for mood and feeling, 0.729 for technology use, 0.794 for diet behavior, 0.752 for physical behavior, and 0.756 for sleep quality. Cronbach's alpha reliability is over 0.7 and desirable.

Table 1 presents descriptive findings of the MLSB before and during the COVID-19 period by athlete and non-athlete men and women

The results of Table 1 indicate that all variables except for technology use decreased during the COVID-19 pandemic as compared to the pre-pandemic period.

Table 2 presents the comparison of the mean scores of MLSB before and during COVID-19 in two male and female groups (The normality, equality of variances, and equality of covariance assumptions were met).

The results of Table 2 show that the MLSB are generally different before and during COVID-19. The results also showed a significant difference in mood and feelings, and social participation scores change between men and women before and during the COVID-19 pandemic (P<0.001).

To compare the mean scores of the MLSB before and during the COVID-19 outbreak in two athlete and non-athlete groups, two-way repeated measures ANOVA was used (assumptions of normality, equality of variances, and equality of covariance were met). Table 3 presents the obtained results.

The results of Table 3 show a statistically significant effect of time on the scores of the MLSB in the repeated measures ANOVA (P<0.001). The results indicate that the MLSB is different before and during the COVID-19 outbreak. The obtained results also showed that the

Table 1. Descriptive findings of the MLSB before and during the COVID-19 outbreak by athlete and non-athlete males and females

Dimensions	Gender	Mean±SD				
		Before COVID-19 Outbreak	After COVID-19 Outbreak	Sport	Before COVID-19 Outbreak	After COVID-19 Outbreak
Life satisfaction	Female	14.17±3.97	12.2±4.74	Athlete	13.94±4.24	12.08±4.79
	Male	13.4±4.37	11.95±4.49	Non-athlete	14.21±3.8	12.52±4.61
Mental well-being	Female	29.28±13.4	22.9±5.44	Athlete	27.12±5.2	24.14±5.52
	Male	26.37±5.58	24.21±5.81	Non-athlete	26.15±4.39	23.58±5.88
Social participation	Female	35.18±6.11	23.56±4.08	Athlete	36.74±7.47	26.22±6.39
	Male	34.08±8.004	26.13±7.82	Non-athlete	33.92±5.92	24.27±5.79
Mood and emotions	Female	28.55±6.03	23.86±7.54	Athlete	29.38±6.37	25.8±7.64
	Male	30.56±5.92	28.41±6.09	Non-athlete	28.52±6.09	25.21±7.09
Use of technology	Female	1.56±1.1	2.11±1.29	Athlete	1.75±1.27	2.25±1.37
	Male	1.61±1.34	1.91±1.45	Non-athlete	1.56±1.2	1.94±1.31
Diet	Female	6.12±1.2	5.94±1.29	Athlete	7.13±1.39	5.96±1.52
	Male	6.14±1.46	6.05±1.65	Non-athlete	6.06±1.36	5.92±1.44
Physical activity	Female	140.6±14.41	82.62±19.55	Athlete	206.88±77.38	117.96±65.87
	Male	140.21±13.17	87.63±18.74	Non-athlete	90.08±78.72	63.28±61.09
Sleep quality	Female	34.93±19.9	44.73±20.29	Athlete	28.94±25.96	40.95±38.41
	Male	22.4±15.5	32.41±23.19	Non-athlete	32.02±26.16	30.54±28.35

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change in scores of physical activity and sleep quality is statistically different between athletes and non-athletes before and during the COVID-19 (P<0.001).

Table 4 shows the results of parameters estimation for comparing two groups regarding MLSB before and during COVID-19.

The results of Table 4 show a statistically significant difference in social participation and physical activity between athletes and non-athletes before and during COVID-19 pandemic (P<0.05). Also, a significant difference was observed in technology use during the COVID-19 pandemic and in sleep quality before the COVID-19 pandemic between athletes and non-athletes groups. In other words, the level of social participation and physical activity in athletes compared to non-athletes was statistically higher before the COVID-19 pandemic. Although both athletes and non-athletes groups showed a significant decrease in these behaviors, athletes still show a higher level of physical activity and social participation.

4. Discussion

This study was conducted to assess the psychometric properties of the Persian version of the MLSB questionnaire during the COVID-19 outbreak in male and female athletes and non-athletes. The results show that compared to other available tools, the MLSB questionnaire is considered a reliable and valid instrument to measure the MLSB in the cultural and climatic structure of Iran. The supposed model was examined using confirmatory factor analysis. The results of the fit indices confirmed the fitness of the proposed model. All factorial loadings were significant. Therefore, the present study provides stronger evidence that the MLSB questionnaire can be used to assess MLSB in the Iranian context and culture. The findings of the present research indicate the significant negative effects of the COVID-19 outbreak on mental health, especially mental well-being, mood, and feeling. The findings of this study are consistent with the findings obtained by the studies by Gammon and Hunt, and Ammar Achraf et al. [21, 32].

Table 2. Results of the repeated measures ANOVA test with the within-and between-subjects effects regarding the MLSB males and females

Dimensions	Effects		Sum of Squares	df	Mean Square	F	Sig	Effect Size	Statistical Power
Life satisfaction	Within subject	The effect of time	216.247	1	216.247	46.49	0.001	0.243	1.000
		The effect of time×gender	5.13	1	5.13	1.11	0.292	0.008	0.183
	Between subjects	Gender	19.003	1	19.003	0.553	0.458	0.004	0.114
Mental well-being	Within subject	The effect of time	567.905	1	567.905	73.72	0.001	0.336	1.000
		The effect of time×gender	27.36	1	27.39	3.55	0.061	0.024	0.465
	Between subjects	Gender	36.54	1	36.54	0.759	0.385	0.005	0.139
Social participation	Within subject	The effect of time	7083.459	1	7083.459	323.426	0.001	0.689	1.000
		The effect of time×gender	249.946	1	249.946	11.41	0.001	0.092	0.919
	Between subjects	Gender	36.405	1	36.405	0.581	0.447	0.004	0.118
Mood and emotions	Within subject	The effect of time	864.948	1	864.948	69.71	0.001	0.323	1.000
		The effect of time×gender	119.405	1	119.405	9.62	0.002	0.062	0.869
	Between subjects	Gender	797.959	1	797.959	11.34	0.001	0.072	0.917
Use of technology	Within subject	The effect of time	13.409	1	13.409	33.68	0.001	0.187	1.000
		The effect of time×gender	0.976	1	0.976	2.45	0.119	7	0.343
	Between subjects	Gender	0.409	1	0.409	0.136	0.713	0.001	0.065
Diet	Within subject	The effect of time	1.35	1	1.35	3.06	0.048	0.032	0.512
		The effect of time×gender	0.122	1	0.122	0.275	0.601	0.002	0.082
	Between subjects	Gender	0.338	1	0.338	0.094	0.759	0.001	0.061
Physical activity	Within subject	The effect of time	226138.318	1	226138.318	40.16	0.001	0.216	1.000
		The effect of time×gender	539.19	1	539.19	0.096	0.757	0.001	0.061
	Between subjects	Gender	393.994	1	393.997	6	0.898	0.001	0.052
Sleep quality	Within subject	The effect of time	0.787	1	5152.787	20.25	0.001	0.122	0.994
		The effect of time×gender	156.166	1	156.166	0.614	0.435	0.004	0.122
	Between subjects	Gender	14462.03	1	14462.03	13.06	0.001	0.082	0.948

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Weakening of physical and social contacts with the disruption of normal lifestyles (e.g. freedoms attenuation, financial losses, sedentary behavior, sleep disorder, unhealthy diet) during the COVID-19 outbreak have been suggested as the main risk factors to reduce emotional well-being and being diagnosed with mental disorders [22, 4]. Moreover, research indicates that certain groups may be more vulnerable to the psychosocial effects of the COVID-19 pandemic, especially, people with risk factors for COVID-19 infection (e.g. people with diabetes, chronic heart failure, chronic obstructive pulmonary disease (COPD), and immunodeficiency), people living in communal settings (e.g. nursing homes), and susceptible people and or those with psychiatric or substance

Table 3. Results of the repeated measures ANOVA test with the within- and between-subjects effects regarding the MLSB

Dimensions		Effects	Sum of Squares	Degrees of Freedom	Mean Square	F	Sig	Effect Size	Statistical Power
Life satisfaction	Within subject	The effect of time	455.51	1	455.51	90.69	0.001	0.239	0.001
		The effect of time×gender	0.993	1	0.993	0.198	0.657	0.001	0.073
	Between subjects	gender	18.65	1	18.65	0.558	0.456	0.002	0.116
Mental well-being	Within subject	The effect of time	1117.284	1	1117.284	110.64	0.001	0.278	1.000
		The effect of time×gender	6.002	1	6.002	0.594	0.441	0.002	0.12
	Between subjects	Gender	84.209	1	84.209	1.84	0.176	0.006	0.272
Social participation	Within subject	The effect of time	14751.078	1	14751.078	726.627	0.001	0.716	1.000
		The effect of time × gender	27.809	1	27.809	1.37	0.243	0.005	0.215
	Between subjects	Gender	828.016	1	828.016	13.27	0.001	0.044	0.935
Mood and emotions	Within subject	The effect of time	1724.138	1	1724.138	101.18	0.001	0.26	1.000
		The effect of time×gender	2.49	1	2.49	0.146	0.703	0.001	0.067
	Between subjects	Gender	77.49	1	77.49	1.02	0.314	0.004	0.171
Use of technology	Within subject	The effect of time	27.37	1	27.37	67.92	0.001	0.191	1.000
		The effect of time×gender	0.559	1	0.559	1.38	0.24	0.005	0.217
	Between subjects	Gender	9.44	1	9.44	3.206	0.047	1	0.13
Diet	Within subject	The effect of time	3.49	1	3.49	6.36	2	0.022	0.71
		The effect of time×gender	0.043	1	0.043	0.079	0.079	0.001	0.059
	Between subjects	Gender	0.498	1	0.498	0.141	0.708	0.001	0.066
Physical activity	Within subject	The effect of time	485433.82	1	485433.82	86.106	0.001	0.23	1.000
		The effect of time×gender	139888.028	1	139888.028	24.81	0.001	0.079	0.999
	Between subjects	Gender	1066108.34	1	1066108.34	44.53	0.001	0.134	1.000
Sleep quality	Within subject	The effect of time	1282.002	1	1282.002	52.95	0.001	0.155	1.000
		The effect of time×gender	1145.216	1	1145.216	4.94	0.027	7	0.701
	Between subjects	Gender	10.76	1	10.76	0.008	0.928	0.001	0.051

Table 4. Results of parameters estimation by dependent variables or the mean score of MLSB before and during the COVID-19 pandemic in athletes and non-athletes

Dimensions	Time	B	SD Error	t	Sig	The Volume of the Effect	Statistical Power
Life satisfaction	Before the pandemic	-0.276	0.474	-0.583	0.561	0.001	0.089
	During the pandemic	-0.441	0.553	-0.798	0.425	0.002	0.125
Mental well-being	Before the pandemic	0.966	0.566	1.71	0.089	0.001	0.398
	During the pandemic	0.559	0.671	0.833	0.406	0.002	0.132
Social participation	Before the pandemic	2.82	0.792	3.57	0.001	0.042	0.945
	During the pandemic	1.95	0.716	2.72	0.007	0.025	0.775
Mood and emotions	Before the pandemic	0.862	0.732	1.18	0.24	0.005	0.214
	During the pandemic	0.6	0.866	0.693	0.489	0.002	0.106
Use of technology	Before the pandemic	0.193	0.14	1.32	0.186	0.006	0.269
	During the pandemic	0.317	0.158	2.006	0.464	4	0.518
Diet	Before the pandemic	0.046	0.162	0.469	0.639	0.001	0.075
	During the pandemic	0.041	0.174	0.238	0.812	0.001	0.055
Physical activity	Before the pandemic	116.608	15.96	7.32	0.001	0.157	1.000
	During the pandemic	54.68	12.37	4.42	0.001	0.064	0.993
Sleep quality	Before the pandemic	-3.08	1.06	2.007	0.04	0.038	0.772
	During the pandemic	2.52	3.46	0.733	0. 464	0.002	0.111

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use problems are already at increased risk of mental health problems [5]. Since the psychosocial complications caused by the COVID-19 pandemic seem to be significantly associated with unhealthy lifestyle behaviors, including physical and social sedentary behavior, poorer sleep quality, and unhealthy diet [22, 4], therefore measuring the lifestyle in this era is justified.

According to the results of the present research, the level of mood and feelings and sleep quality in women and men were low before and during the COVID-19 pandemic, but the participants of both genders experienced a reduction in social participation only during the COVID-19 pandemic, and this reduction was higher in women than in men. The results of this study are consistent with the results obtained by Ammar Achraf et al. [32]. It seems that one of the reasons for the low level of mood and feelings and low quality of sleep in women compared to men is their stronger presence at home and a weaker presence in friendly gatherings and society. These dimensions have further increased due to the prevalence of coronavirus and forced quarantine, taking after some family members at home as a result of getting the COVID-19 infection and staying at home more, as well as changes in lifestyle.

Moreover, the results of the present research showed that the level of social participation and physical activity in athletes group was higher compared to the non-athletes group before the COVID-19 prevalence. Although the level of social participation and physical activity decreased in both athlete and non-athlete groups during the COVID-19 prevalence, athletes still have a higher level of social participation and physical activity. The ob-

tained results also showed that the rate of technology use was significantly higher in athletes than in non-athletes during COVID-19.

The results of the present research are inconsistent with the results obtained by Mohammadi Torkamani et al. [33]. This inconsistency is probably because their research has only addressed the lifestyle of elite athletes from four team sports, volleyball, basketball, soccer, and futsal without mentioning their age range or studying non-athletes.

One of the vital reasons for reduction of social participation and physical activity in non-athletes seems to be the low importance given to the role of exercise during the COVID-19 outbreak. While athletes also experienced a reduction in these dimensions compared to before the COVID-19 outbreak, athletes have a higher level of social participation and physical activity compared to non-athletes due to attendance in gatherings and friendly groups. Moreover, both groups have tended toward technology use and further use of cyberspace as a result of the home quarantine. However, due to the closure of sports centers, athletes are still more willing to use cyberspace to perform sports activities and participate in online sports classes than non-athletes.

Among the limitations of the present research is the researcher's lack of complete control over the accuracy of the subjects' responses due to online sampling. In addition, only people who had access to or mastery of cyberspace participated in this study. This research showed that the MLSB questionnaire provides desirable validity and reliability, therefore, the researchers are suggested to use the Persian version of this questionnaire in future research and also assess the psychometric properties of the questionnaire for adolescents and people with special diseases. Moreover, it is suggested that the MLSB be measured in various sports fields, different skill levels, and sports experience of male and female athletes. In the following, it is suggested that the social communications, physical activity, sleep quality, and healthy diet behaviors be strengthened through multidisciplinary interventions [34-36] using technology-based solutions, such as fitness and nutrition programs, sleep tracker, broadcasting video, sports games, social media networks, gamification and or virtual coaching to help the general public. Moreover, since the population is more vulnerable to psychosocial stress, supportive intervention should include psychosocial services (e.g. psychoeducation, cognitive-behavioral techniques, and/or consultation with professionals) presented through telemedicine [22]. However, to ensure a sustainable intervention approach, future research should evaluate the prolonged effect of the COVID-19 pandemic on people's health and determine which lifestyle components may remain undesirable after quarantine.

5. Conclusion

In summary, the findings of this study showed that the lifestyle has changed during the COVID-19 pandemic and these changes have been associated with advantages, such as changes in diet (elimination of unnecessary expenses, such as going to a restaurant), dialogue (increasing dialogue, interaction, and tolerance in families) leisure time (types of training at home and relying on social media networks), cyberspace (launching online businesses on the networks and cyberspace platform), and reconciliation with books and reading (increasing the level of knowledge, awareness), and disadvantages, such as low level of mood and feelings, changes in the sleep quality and hours, reduction of physical activity and closure of sports and entertainment centers, as well as an increase in the technology and cyberspace use, and consequently, sedentary behavior during the COVID-19 pandemic and home quarantine. Given that women showed a significant reduction in the MLSB compared to men, thus it is suggested that this finding be considered by the welfare and other related centers, and it is recommended that some measures be taken to improve the quality of women's lifestyle. Moreover, considering that the level of social participation and physical activity in athletes was higher than in non-athletes during the COVID-19 pandemic, the importance of exercise is thus identified and it is recommended to community health planners to take measures toward providing facilities and encouraging people to attend sports environments.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by Ethics Committee of the Islamic Azad University of Isfahan Branch (Khorasgan) (Code: IR.IAU.KHUISF.REC.1400.277). All ethical principles have been observed in this article, including obtaining full consent from the participants. Participants were allowed to withdraw from the study at any time. Also, they were informed about the research process and their information was kept confidential.

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Authors' contributions

Designing, ideation, and editing of the final version: Zohreh Meshkati; Data collection and analysis, initial writing of the article: Samira Dabaghi.

Conflict of interest

The authors declared no conflict of interest.

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