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A novel version of Copenhagen Psychosocial Questionnaire-3: Turkish validation study

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ABSTRACT

Purpose: The aim of the study was to adapt the Copenhagen Psychosocial Questionnaire Version-3 (COPSOQ-3) into the Turkish language.

Methods: This is a methodologic study. The field study occurred in four workplaces (call center, hospital, plastic and metal industries). The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were used to assess the suitability of the sample for factor analysis. The principal component analysis and varimax rotation methods were used to identify the factor structure. The internal consistency was assessed using the Cronbach's alpha coefficient.

Results: In total, 1076 respondents' questionnaires were evaluated. Fifty-eight percent of the participants were men and the mean age was 31.1 ± 7.7 . Sampling adequacy was considered adequate (KMO = 0.929). The factor analysis of the Turkish COPSOQ (COPSOQ-TR) identified 19 factors with eigenvalues higher than one and explained 66.1% of the total variance. The Cronbach's alpha values of 23 dimensions were over 0.70. The Cronbach's alpha values of control over working time and predictability were 0.54 and 0.66, respectively. The model was an excellent fit (Chi-Square = 8514.5, $\chi^2/df = 2.48$, RMSEA = 0.038, SRMR = 0.053, CFI = 0.98).

Conclusions: Findings show that COPSOQ-TR is a reliable and valid instrument that can be a useful tool to measure psychosocial risks in the Turkish language.

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Assessment; psychosocial risks; scale; work


Introduction

The industrial sector and the production of goods are being replaced by the service sector and the production of information technologies; this is quite common in developed countries, and is becoming more and more common in developing countries every day.¹ This replacement results in a number of changes in the content, organization, and management of business and the qualifications and requirements of the employees. Today, psychosocial risks are more important than in the past, particularly at workplaces where employees have more workload and less control over their work, assessed regarding their performances, work under contract and are uninsured.^{1,2} In recent years, the most important problems about psychosocial risk prevention have been the sensitivity of the issue, dealing with difficult customers, lack of awareness, resources, training and information in Europe.³

There are a number of factors that are categorized as psychosocial risks by researcher; these factors include complexity and meaning of work, variability, mental workload, time pressure, variable working hours, role-conflicts, education, personal relationships, social support, work-life conflict, age and cultural discrimination.⁴ Demands, control, relationships, instability, roles and social support status at work caused the emergence of work-stress models.

More than 500,000 people in England stated in 2005 that they believed work-related stress harmed their health. It is estimated that 12.8 million workdays are lost in Britain so far because of stress-related depression or anxiety.⁵ There are official regulations in many countries with which employers have to comply to protect the health and safety of employees. This obligation includes the management of stress-related hazards that cause physical health problems as well as work stress and mental health problems.⁶

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 Supplemental data for this article can be accessed on the [publisher's website](#).

According to the Occupational Health and Safety (OHS) Law No. 6331, which is enacted in Turkey as a reflection of the European Union harmonization process in 2012. According to this, law workplaces required legal obligation to conduct risk assessments for physical, chemical and biological risks.⁷ In the OHS Risk Assessment Regulation, it is stated that physical and psychosocial risks must be prevented.⁸ The psychosocial risks in Turkey include workload, pressure to meet production goals, work intensity, poor/lack of control over tasks, role ambiguity, performance-based systems, social relations and job insecurity in Turkey.⁹ However, OHS Law No. 6331 does not include any information about the psychosocial risk factors.⁷ The lack of Turkish psychosocial risk assessment guidelines or questionnaires, which are commonly used around the world, cause workplaces to have difficulty in this area.⁹ Psychosocial risk assessment should be done to improve work environment in workplaces.^{9,10} Effort-reward imbalance and job demands-control-support scales were adapted into Turkish as psychosocial risk scales.^{11,12} However, many new risk factors have been defined in recent years in addition to the psychosocial risks that are assessed in these models. The Copenhagen Psychosocial Questionnaire Version-3 (COPSOQ-3), which allows assessing a majority of these newly defined psychosocial risk factors, includes also current psychosocial risks. Previous versions of COPSOQ-3 were adapted to many languages and have been used extensively in studies of this topic.¹³ COPSOQ-3 is the actual and revised questionnaire, which is also validated in German, Spanish, French and Swedish.¹⁴ COPSOQ-3 consists of three different questionnaires with different item numbers: 'long version' for research, 'medium version' for occupational health professionals (e.g., joint health safety departments, occupational health centers, large workplaces, worker and employer organizations), and 'core version' for rapid assessment and use in small workplaces.¹⁵ The long version includes the medium version, and the medium version includes the core version. The aim of this study was to adapt the COPSOQ-3 into Turkish.

Methods

The questionnaire content

The Turkish Copenhagen Psychosocial Questionnaire (COPSOQ-TR) included 25 dimensions and 88 items. To create COPSOQ-TR and adapt it to Turkish, the researcher took 29 items from the long version of the scale and added them to the medium version of

the original COPSOQ-3. Figure 1 presents the dimensions, and item numbers in the COPSOQ-TR and the Supplementary Table presents their operational definitions.

The definitions of these dimensions are in Supplementary Table. For the assessment, the score of each dimension was calculated within itself. Therefore, each dimension was calculated individually using an independent and standard method, and the total score was determined based on these values. The scores of items were determined assuming that the contribution of each item to the section's total score was equal. In the scoring of items, the job satisfaction dimension was scored on a 4-point Likert-type scale (very satisfied – 4, satisfied – 3, not satisfied – 2, not satisfied at all – 1), whereas all other dimensions were scored on a 5-point Likert type scale (always – 5, often – 4, sometimes – 3, rarely – 2, never – 1). The participants that missed to answer more than half of COPSOQ-TR questionnaire items were excluded from the study. In cases where more than half of the dimension items were answered, the missing item score was derived by calculating the average of scores the participant gave to the other items in the relevant dimension. The median values of dimension total scores were used as the cut-off point and the scores were assessed as high or low.

Sample selection

This is an adaptation study that focused on adapting questionnaire items. The study was conducted with employees at four workplaces including a call center, hospital, plastic manufacturing, and metal industry between August 1, 2016 and December 1, 2017. It has been targeted to include all workers in the selected workplaces. Therefore, there were no exclusion criteria.

The researcher obtained permission from the workplaces of the participants. Moreover, the participants were informed that the study would be conducted on a voluntary basis, and their consent was received. The study data were collected with the printed questionnaire forms that were given to the employees. Ethics committee consent was received from the Non-Invasive Clinical Studies Ethics Committee of Dokuz Eylül University (Decision No. 2016/07-35; Decision Date: March 10, 2016).

Statistical analysis

The internal consistency of the questionnaire was assessed with the Cronbach's alpha coefficients that

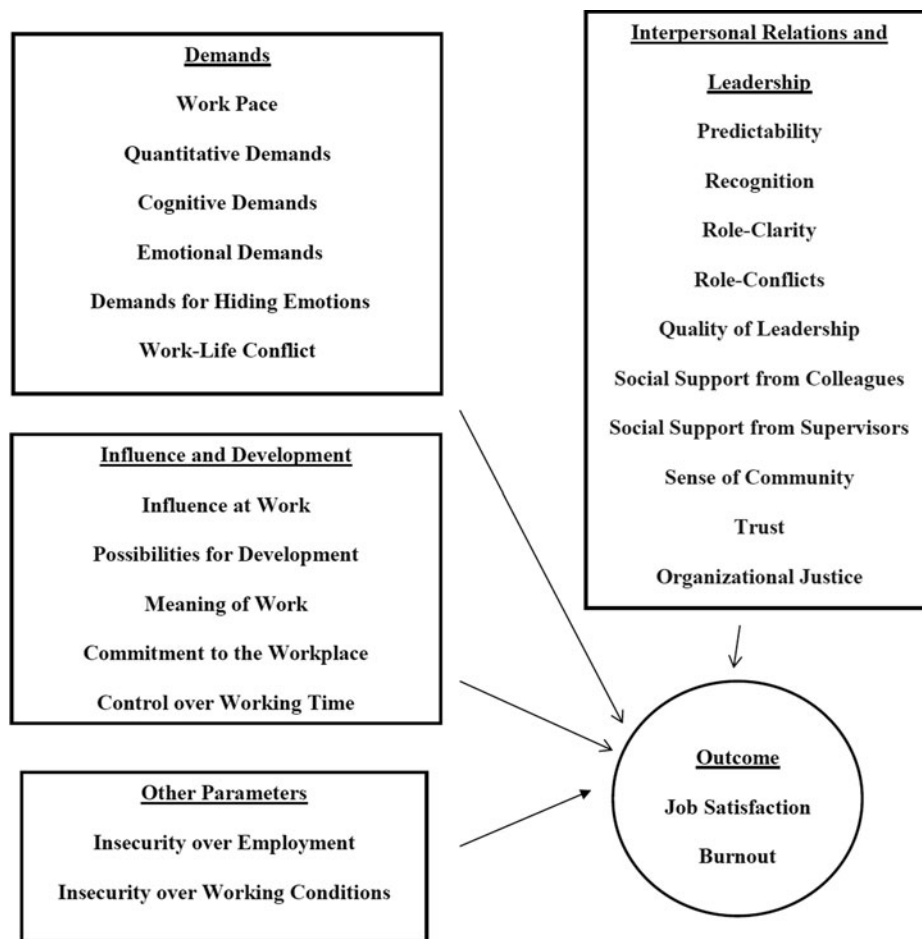


Figure 1. The COPSOQ groups and dimensions.

were calculated for each dimension. The researcher also calculated the mean values and Cronbach's alpha coefficients for each dimension constituting the COPSOQ-TR, mean values, the percentage of those with the lowest (floor effect) and highest (ceiling effect) scores, Cronbach's alpha coefficients if item was deleted, and item-total correlations that were corrected for each overlapping item. Bartlett's Test of Sphericity was used to assess the suitability of the sample for factor analysis. The Kaiser-Meyer-Olkin (KMO) test was used to determine the sufficiency of the sample size. To determine the construct validity of the questionnaire, the study carried out exploratory factor analysis, and employed the principal component analysis and varimax rotation methods. The study considered the factor structures that were generated in the exploratory factor analysis to understand the distribution of the items. We have used EFA since COPSOQ is an improvable questionnaire. Confirmatory factor analysis was used to test the current structure and the compliance between the theoretical structure and the generated structure. The model compliance of COPSOQ-TR was assessed using

first-level confirmatory factor analysis (CFA). The CFA used, multiple fit indices [root mean square residual (RMR), root mean square error of approximation (RMSEA), standardized RMR (SRMR), and comparative fit index (CFI)]. A value of CFI >0.90 was the acceptable limit and >0.95 was the excellent fit limit.^{16,17} For RMR, RMSEA and SRMR, a value of <0.08 was the acceptable limit and <0.50 was the excellent fit limit.^{16,17} The study determined the cut-off point based on the median values of dimension total scores and assessed the scores of the dimensions as high and low. The chi-square test was used to assess whether the psychosocial risk dimensions individually predicted job satisfaction and burnout. The data were analyzed using SPSS 20.0 (IBM SPSS Statistics) and LISREL 9.1 (Scientific Software International, Inc.) statistical package programs.

Results

Of 1356 employees, only 1120 participated in the study (Participation rate =82.6%). A total of 44 (3.9%) participants were excluded from the study

because they did not answer more than half (50%) of the items on the COPSQOQ-TR. Therefore, the study analyzed the data that were collected from 1076 participants. Of the participants, 53.9% were female and 57.5% were white-collar employees while, 42.5% were blue-collar employees. The mean age of participants was 31.1 ± 7.7 years and the median age was 30. This study also found that 14.9% of the participants were secondary school or primary school graduates, 34.9% were high school graduates, and 50.1% had junior college degrees or higher degree.

Language validation

Two language and translation experts first translated the questionnaire from English into Turkish. Afterwards, the researcher consulted language and field experts about these two translations. The researcher examined and revised the translations regarding their language, culture and field compliance. After the revisions were completed, the questionnaire was translated into English by two translation experts and compared with the original English questionnaire. In this comparison, the differences between the two versions were eliminated and the translation was completed. Afterwards, the translated questionnaire was administered to a pilot group of 21 people to test its language validity. These individuals were asked to express their opinions about the understandability and meaning of each item. The researcher revised the questionnaire based on these opinions to obtain the final form of the questionnaire.

Internal consistency

Table 1 presents the mean values and Cronbach's alpha coefficients for each dimension constituting the COPSQOQ-TR, mean values, the percentage of those obtaining the lowest (floor effect) and highest (ceiling effect) scores, Cronbach's alpha coefficients if item was deleted, and item-total correlations for each overlapping item. The table reveals that there was a great number of participants that obtained the highest score in role-clarity (17.2%) and sense of community (24.7%). The examination of Cronbach's alpha coefficients if item was deleted, of the first item of quantitative demands dimension, the third item of demands for hiding emotions dimension, the first item of possibilities for development dimension, the fifth item of control over working time dimension, the first item of commitment to the workplace dimension, the first item of

work-life conflict dimension, the first item of trust dimension, and the fifth item of job satisfaction dimension showed that the sub-dimension in which each item was included was higher than Cronbach's alpha value. Moreover, this study found that the Cronbach's alpha value of each dimension was higher than 0.50. This result indicates that the items exhibited a good coexistence with their dimensions.

Construct validity

The Kaiser-Meyer-Olkin (KMO) coefficient was 0.929 and the Bartlett test was $p < 0.001$. Because the KMO value was higher than 0.60 and the result of Bartlett test was significant, the data were suitable for factor analysis.¹⁸ The exploratory factor analysis was performed to determine the construct validity of questionnaire. The results of principal component analysis and varimax rotation showed that 19 factors explaining 66.1% of the total variance. Six items in 25 dimensions were common factor loads with these 19 factors.

The researcher examined questionnaire components according to the factor structure, and found that 21 dimensions were compatible regarding factor loadings. These dimensions were work pace, quantitative demands, emotional demands, influence at work, possibilities for development, meaning of work, commitment to the workplace, predictability, recognition, role-clarity, role-conflicts, quality of leadership, social support from colleagues, sense of community, insecurity over employment, insecurity over working conditions, work-life conflict, trust, organizational justice, job satisfaction and burnout. Moreover, this study found that the fourth item of cognitive demands dimension, the third item of demands for hiding emotions dimension, the fifth item of control over working time dimension, and the first item of social support from supervisors dimension shared their factor loadings with the quantitative demands dimension, the cognitive demands dimension, and the social support from colleagues dimension, respectively. The emotional demands and demands for hiding emotions; meaning of work and commitment to the workplace; quality of leadership and social support from supervisors; insecurity over employment and insecurity over working conditions; predictability, recognition, trust and organizational justice dimensions shared the same factor loadings.

The question, 'Do you have to do overtime?' in the quantitative demands dimension was included in the control over working time dimension, which did not comply with the model. The exploratory factor

Table 1. COPSOQ items and results of internal consistency analysis, and CFA analyses.

Dimensions and questions	CFA			Ceiling effect %	Cronbach's alpha	CITC*	CAID*
	Mean ± SD	Error Var.	R ²				
Work pace	11.04 ± 2.52			11.7	0.861		
1. Do you have to work very fast?	3.79 ± 0.85	0.45	0.55	0.3		0.677	0.860
2. Do you work at a high pace throughout the day?	3.66 ± 0.94	0.22	0.78			0.793	0.751
3. Is it necessary to keep working at a high pace?	3.60 ± 1.06	0.27	0.73			0.759	0.791
Quantitative demands	8.05 ± 2.69			3.5	0.776		
4. Is your workload unevenly distributed so it piles up?	2.88 ± 1.19	0.59	0.41			0.521	0.813
5. Do you get behind with your work?	2.59 ± 1.04	0.38	0.62			0.655	0.652
6. Do you have enough time for your work tasks?	2.59 ± 0.99	0.33	0.67			0.679	0.632
Cognitive demands	15.13 ± 9.89			0.4	0.741		
7. Do you have to keep your eyes on lots of things while you work?	4.49 ± 0.84	0.70	0.30			0.486	0.712
8. Does your work require that you remember a lot of things?	4.25 ± 0.97	0.59	0.41			0.574	0.662
9. Does your work demand that you are good at coming up with new ideas?	3.51 ± 1.14	0.55	0.45			0.573	0.659
10. Does your work require you to make difficult decisions?	2.87 ± 1.20	0.48	0.52			0.532	0.689
Emotional demands	8.38 ± 3.40			10.2	0.830		
11. Does your work put you in emotionally disturbing situations?	2.93 ± 1.25	0.42	0.58			0.665	0.789
12. Do you have to deal with other people's personal problems as part of your work?	2.73 ± 1.35	0.44	0.56			0.652	0.803
13. Is your work emotionally demanding?	2.72 ± 1.33	0.26	0.74			0.754	0.698
Demands for hiding emotions	9.92 ± 2.99			1.4	0.696		
14. Are you required to treat everyone equally, even if you do not feel like it?	2.76 ± 1.35	0.25	0.75			0.658	0.394
15. Does your work require that you hide your feelings?	3.01 ± 1.38	0.34	0.66			0.641	0.419
16. Are you required to be kind and open towards everyone?	4.15 ± 1.02	0.90	0.10			0.287	0.831
Influence at work	12.13 ± 4.42			4.8	0.765		
17. Do you have a large degree of influence on the decisions concerning your work?	2.76 ± 1.19	0.69	0.31			0.499	0.734
18. Do you have a say in choosing who you work with?	2.03 ± 1.24	0.83	0.17			0.405	0.766
19. Can you influence the amount of work assigned to you?	1.89 ± 1.09	0.67	0.33			0.550	0.719
20. Do you have any influence on what you do at work?	2.41 ± 1.32	0.33	0.67			0.651	0.677
21. Do you have any influence on HOW you do your work?	3.03 ± 1.30	0.43	0.57			0.579	0.706
Possibilities for development	14.05 ± 3.87			0.7	0.755		
22. Is your work varied?	3.40 ± 1.34	0.85	0.15			0.358	0.803
	3.65 ± 1.21	0.54	0.46			0.615	0.664

(Continued)

Table 1. Continued.

Dimensions and questions	CFA			Ceiling effect %	Cronbach's alpha	CITC*	CAID*
	Mean ± SD	Error Var.	R ²				
23. Do you have the possibility of learning new things through your work?	3.64 ± 1.23	0.42	0.58			0.622	0.660
24. Can you use your skills or expertise in your work?	3.36 ± 1.32	0.29	0.71			0.639	0.646
25. Does your work give you the opportunity to develop your skills?				0.8	0.543		
Control over working time	12.52 ± 3.69						
26. Can you decide when to take a break?	2.39 ± 1.34	0.45	0.55			0.463	0.379
27. Can you take holidays more or less when you wish?	2.89 ± 1.38	0.73	0.27			0.333	0.471
28. Can you leave your work to have a chat with a colleague?	2.42 ± 1.10	0.60	0.40			0.505	0.379
29. If you have some private business is it possible for you to leave your piece of work for half an hour without special permission?	1.58 ± 1.05	0.91	0.094			0.257	0.514
30. Do you have to do overtime?	3.24 ± 1.30	1.00	0.003			0.046	0.638
Meaning of work	11.72 ± 2.52			0.7	0.796		
31. Is your work meaningful?	3.88 ± 0.97	0.33	0.67			0.684	0.676
32. Do you feel that the work you do is important?	4.12 ± 0.95	0.30	0.70			0.717	0.644
33. Do you feel motivated and involved in your work?	3.72 ± 1.07	0.58	0.42			0.533	0.844
Commitment to the workplace	10.36 ± 2.96			2.1	0.751		
34. Do you enjoy telling others about your place of work?	2.93 ± 1.31	0.78	0.22			0.439	0.838
35. Do you feel that your place of work is of great importance to you?	3.75 ± 1.12	0.32	0.68			0.666	0.575
36. Are you proud of being part of this organization?	3.68 ± 1.19	0.22	0.78			0.657	0.577
Predictability	6.29 ± 2.05			4.1	0.660		
37. At your place of work, are you informed well in advance concerning for example important decisions, changes or plans for the future?	2.72 ± 1.29	0.56	0.44			0.251	–
38. Do you receive all the information you need in order to do your work well?	3.57 ± 1.07	0.42	0.58			0.251	–
Recognition	8.81 ± 3.36			7.5	0.852		
39. Is your work recognized and appreciated by the management?	2.77 ± 1.32	0.36	0.64			0.718	0.798
40. Does the management at your workplace respect you?	2.98 ± 1.29	0.25	0.75			0.782	0.734
41. Are you treated fairly at your workplace?	3.06 ± 1.21	0.38	0.62			0.671	0.840
Role-clarity	12.03 ± 2.41			0.7	0.797		
42. Does your work have clear objectives?	3.93 ± 0.97	0.46	0.54			0.613	0.752
43. Do you know exactly which areas are your responsibility?	3.92 ± 1.02	0.34	0.66			0.696	0.661
44. Do you know exactly what is expected of you at work?	4.82 ± 0.87	0.48	0.52			0.621	0.746

(Continued)

Table 1. Continued.

Dimensions and questions	CFA			Ceiling effect %	Cronbach's alpha	CITC*	CAID*
	Mean ± SD	Error Var.	R ²				
Role-conflicts	8.44 ± 3.07				0.799		
45. Are contradictory demands placed on you at work?	2.66 ± 1.23	0.59	0.41	7.3		0.574	0.797
46. Do you sometimes have to do things which ought to have been done in a different way?	2.86 ± 1.18	0.36	0.64			0.703	0.663
47. Do you sometimes have to do things which seem to be unnecessary?	2.92 ± 1.23	0.31	0.69			0.656	0.711
Quality of leadership	13.56 ± 4.03				0.893		
48. To what extent would you say that your immediate superior makes sure that the members of staff has good development opportunities?	3.35 ± 1.07	0.41	0.59	2.7		0.710	0.882
49. To what extent would you say that your immediate superior gives high priority to job satisfaction?	3.25 ± 1.19	0.28	0.72			0.793	0.851
50. To what extent would you say that your immediate superior is good at work planning?	3.54 ± 1.13	0.27	0.73			0.801	0.849
51. To what extent would you say that your immediate superior is good at solving conflicts?	3.42 ± 1.23	0.31	0.69			0.757	0.866
Social support from colleagues	10.30 ± 2.63				0.779		
52. How often do you get help and support from your colleagues, if needed?	3.41 ± 1.05	0.57	0.43	0.5		0.568	0.754
53. How often are your colleagues willing to listen to your problems at work, if needed?	3.48 ± 1.09	0.30	0.70			0.685	0.623
54. How often do your colleagues talk with you about how well you carry out your work?	3.41 ± 1.01	0.46	0.54			0.602	0.719
Social support from supervisors	9.94 ± 3.06				0.840		
55. How often is your immediate superior willing to listen to your problems at work, if needed?	3.14 ± 1.13	0.47	0.53	2.8		0.651	0.828
56. How often do you get help and support from your immediate superior, if needed?	3.44 ± 1.23	0.27	0.73			0.752	0.731
57. How often does your immediate superior talk with you about how well you carry out your work?	3.36 ± 1.16	0.33	0.67			0.715	0.768
Sense of community	11.74 ± 2.76				0.836		
58. Is there a good atmosphere between you and your colleagues?	4.08 ± 0.98	0.29	0.71	0.5		0.726	0.750
59. Is there good co-operation between the colleagues at work?	3.86 ± 1.04	0.31	0.69			0.719	0.752
60. Do you feel part of a community at your place of work?	3.80 ± 1.15	0.41	0.59	24.7		0.659	0.819
Insecurity over employment	8.39 ± 3.53				0.831		
61. Are you worried about becoming unemployed?	3.12 ± 1.40	0.36	0.64	12.9		0.704	0.752
62. Are you worried about new technology making you redundant?	2.59 ± 1.34	0.37	0.63			0.691	0.765
	2.68 ± 1.35	0.40	0.60			0.675	0.781

(Continued)

Table 1. Continued.

Dimensions and questions	CFA				Cronbach's alpha	CITC*	CAID*
	Mean ± SD	Error Var.	R ²	Floor effect %			
63. Are you worried about it being difficult for you to find another job if you became unemployed?	9.17 ± 3.52	0.49	0.51	8.4	7.7	0.548	0.696
Insecurity over working conditions							
64. Are you worried about being transferred to another job against your will?	2.92 ± 1.38	0.46	0.54			0.621	0.613
65. Are you worried about your working tasks being changed against your will?	3.11 ± 1.42	0.54	0.46			0.563	0.684
66. Are you worried about a decrease in your salary?	3.14 ± 1.52	0.54	0.46			0.563	0.684
Work-life conflict							
67. Are there times when you need to be at work and at home at the same time?	14.68 ± 5.94	0.85	0.15	5.3	4.4	0.382	0.893
68. Do you feel that your work drains so much of your energy that it has a negative effect on your private life?	2.87 ± 1.39	0.29	0.71			0.758	0.804
69. Do you feel that your work takes so much of your time that it has a negative effect on your private life?	3.09 ± 1.53	0.29	0.71			0.758	0.804
70. The demands of my work interfere with my private and family life?	2.99 ± 1.52	0.18	0.82			0.800	0.792
71. Due to work-related duties, I have to make changes to my plans for private and family activities.	2.74 ± 1.50	0.33	0.67			0.759	0.804
Trust							
72. Do the employees in general trust each other?	2.99 ± 1.50	0.49	0.51	1.6	2.7	0.678	0.826
73. Does the management trust the employees to do their work well?	12.69 ± 3.46	0.72	0.28			0.490	0.853
74. Can the employees trust the information that comes from the management?	3.01 ± 1.07	0.36	0.64			0.729	0.749
75. Are the employees able to express their views and feelings?	3.24 ± 1.01	0.34	0.66			0.716	0.753
Organizational justice							
76. Are conflicts resolved in a fair way?	3.09 ± 1.12	0.31	0.69			0.693	0.763
77. Is the work distributed fairly?	11.84 ± 4.08	0.31	0.69	4.6	3.7	0.733	0.839
78. Are employees appreciated when they have done a good job?	3.00 ± 1.12	0.43	0.57			0.705	0.849
79. Are all suggestions from employees treated seriously by the management?	3.10 ± 1.15	0.38	0.62			0.738	0.837
Job satisfaction							
80. Regarding your work in general. How pleased are you with your work prospects?	2.86 ± 1.28	0.33	0.67			0.750	0.831
81. Regarding your work in general. How pleased are you with the physical working conditions?	2.87 ± 1.24	0.33	0.67			0.750	0.831
82. Regarding your work in general. How pleased are you with the way your abilities are used?	12.94 ± 3.26	0.28	0.72	3.2	2.5	0.759	0.822
	2.63 ± 0.84	0.38	0.62			0.712	0.834
	2.52 ± 0.82	0.38	0.62			0.712	0.834
	2.65 ± 0.78	0.40	0.60			0.713	0.835

(Continued)

Table 1. Continued.

Dimensions and questions	CFA		Mean ± SD	Error Var.	R ²	Floor effect %	Ceiling effect %	Cronbach's alpha	CITC*	CAID*
	Error Var.	R ²								
83. Regarding your work in general. How pleased are you with your job as a whole, everything taken into consideration?	0.38	0.62	2.82 ± 0.74						0.733	0.831
84. Regarding your work in general. How pleased are you with your salary?	0.64	0.36	2.33 ± 0.84						0.552	0.875
Burnout										
85. How often have you felt worn out during the last 4 weeks?	0.22	0.78	13.71 ± 3.98 3.53 ± 1.01			1.9	6.4	0.925	0.829	0.903
86. How often have you been physically exhausted during the last 4 weeks?	0.14	0.86	3.37 ± 1.11						0.875	0.886
87. How often have you been emotionally exhausted during the last 4 weeks??	0.29	0.71	3.20 ± 1.19						0.804	0.913
88. How often have you felt tired during the last 4 weeks?	0.29	0.71	3.61 ± 1.08						0.808	0.909

CFA: Item-Dimension Results, CITC: Corrected Item-Total Correlation, CAID: Cronbach's Alpha if Item Deleted.

analysis showed that this item was included in a factor other than the control over working time dimension in COPSOQ-3. When the item was excluded, the Cronbach's alpha value was higher than the Cronbach's alpha value of the subdimension. Considering that this item generated high-error level and low-dimension coexistence in the confirmatory factor analysis, it should be assessed carefully in further studies. The control over working time dimension consisted of five items as in COPSOQ-3 with a Cronbach's alpha value of 0.54, supporting the above-mentioned result.

As a result of the confirmatory factor analysis, which was performed to determine the COPSOQ-TR model fit, the chi-square fit value of factor structure consisting of 25 dimensions and 88 items was significant ($\chi^2=8514.5$, $Sd = 3440$, $p < 0.001$) and the χ^2/df value related to the model fit was 2.48. The goodness-of-fit index values were 0.038 for RMSEA, 0.053 for RMR, 0.053 for SRMR, and 0.98 for CFI. These values demonstrated that the model had an excellent fit. The error levels in measuring the dimension of each item showed that the fifth item of control over working time dimension (error variance: 0.997, standardized beta value: 0.054) was at high-error level and low-dimension coexistence whereas the second item of burnout dimension (error variance: 0.137, standardized beta value: 0.929) was low error level and high dimension coexistence. Moderate-level error and dimension coexistence was observed in all other items.

We also assessed whether the psychosocial risk dimensions were associated with individual job satisfaction and burnout (Tables 2 and 3). The respondents with high scores in work pace, quantitative demands, cognitive demands, emotional demands, demands for hiding emotions, role-conflicts, insecurity over working conditions, work-life conflict, and burnout dimensions had significantly lower job satisfaction scores ($p < 0.05$). The respondents that obtained low scores on influence at work, possibilities for development, meaning of work, commitment to the workplace, predictability, recognition, role-clarity, quality of leadership, social support from colleagues, social support from supervisors, sense of community, insecurity over employment, trust and organizational justice dimensions had significantly lower job satisfaction scores ($p < 0.05$). The respondents whose control over working time scores were low had lower job satisfaction scores, but there was no significant relationship between them ($p > 0.05$). The respondents that had high scores on work pace, quantitative demands, cognitive demands, emotional demands, demands for hiding emotions,

Table 2. Relationship between psychosocial risk dimensions and job satisfaction.

Psychosocial risk dimensions	Job satisfaction				p*	Psychosocial risk dimensions	Job satisfaction				p*
	Low		High				Low		High		
	Number	%	Number	%			Number	%	Number	%	
Work pace											
Low	215	39.2	334	60.8	<0.001	Role-clarity					
High	319	60.5	208	39.5		Low	373	60.8	240	39.2	<0.001
Quantitative demands						High	161	34.8	302	65.2	
Low	187	39.0	293	61.0	<0.001	Role-conflicts					
High	347	58.2	249	41.8		Low	207	38.9	325	61.1	<0.001
Cognitive demands						High	327	60.1	217	39.9	
Low	244	45.4	293	54.6	0.006	Quality of leadership					
High	290	53.8	249	46.2		Low	324	65.6	170	34.4	0.008
Emotional demands						High	210	36.1	372	63.9	
Low	184	33.3	369	66.7	<0.001	Social support from colleagues					
High	350	66.9	173	33.1		Low	303	53.4	264	46.6	<0.001
Demands for hiding emotions						High	231	45.4	278	54.6	
Low	194	40.2	288	59.8	<0.001	Social support from supervisors					
High	340	57.2	254	42.8		Low	352	59.7	238	40.3	<0.001
Influence at work						High	182	37.4	304	62.6	
Low	276	54.1	234	45.9	0.005	Sense of community					
High	258	45.6	308	54.4		Low	269	61.6	168	38.4	<0.001
Possibilities for development						High	265	41.5	374	58.5	
Low	310	57.0	234	43.0	<0.001	Insecurity over employment					
High	224	42.1	308	57.9		Low	301	56.7	230	43.3	<0.001
Control over working time						High	233	42.8	312	57.2	
Low	306	52.1	281	47.9	0.07	Insecurity over working conditions					
High	228	46.6	261	53.4		Low	247	44.3	310	55.7	<0.001
Meaning of 3work						High	287	55.3	232	44.7	
Low	379	58.0	274	42.0	<0.001	Work-life conflict					
High	155	36.6	268	63.4		Low	213	40.6	311	59.4	<0.001
Commitment to the workplace						High	321	58.2	231	41.8	
Low	369	72.1	143	27.9	<0.001	Trust					
High	165	29.3	399	70.7		Low	368	71.3	148	28.7	<0.001
Predictability						High	166	29.6	394	70.4	
Low	385	67.5	185	32.5	<0.001	Organizational justice					
High	149	29.4	357	70.6		Low	358	74.4	123	25.6	<0.001
Recognition						High	176	29.6	419	70.4	
Low	365	74.3	126	25.7	<0.001	Burnout					
High	169	28.9	416	71.1		Low	149	28.1	381	71.9	<0.001
						High	385	70.5	161	29.5	

*Chi-square test.

role-conflicts, insecurity over working conditions, and work-life conflict dimensions obtained significantly higher burnout scores ($p < 0.05$). The respondents that obtained low scores on influence at work, possibilities for development, meaning of work, commitment to the workplace, predictability, recognition, role-clarity, quality of leadership, social support from supervisors, sense of community, insecurity over employment, trust, organizational justice, and job satisfaction dimensions higher burnout scores ($p < 0.05$). Those with low scores on control over working time and social support from colleagues dimensions had higher burnout scores, but there was no significant relationship between them ($p > 0.05$).

Discussion

It is decided to adapt COPSOQ-TR into Turkish language with the purpose of assessing the psychosocial risks in work life. The scale was tested by administering it to the employees of industry and service sector

business enterprises. The participants were heterogeneous with regard to a number of characteristics including age, educational level and occupational classification.

This study found that the floor and ceiling distributions of the items constituting the questionnaire and its subdimensions, except for role-clarity and sense of community, were distant from the extreme values. The items and their options adequately represented the feature that was intended to be measured and the respondents did not give answers that consistently included the extreme values. There were few questions that were not answered by the participants.

The study performed exploratory factor analysis to determine the construct validity of COPSOQ-TR, and found 19 factors that explained 66.1% of the total variance. Larger samples may create the issue of probable statistical significance because of the chi-square test is sensitive to sample size. When the sample size larger than the 500 even small differences would result statistically significant. However, the confirmatory

Table 3. Relationship between psychosocial risk dimensions and burnout.

Psychosocial risk dimensions	Burnout				<i>p</i> *	Psychosocial risk dimensions	Burnout				<i>p</i> *
	Low		High				Low		High		
	Number	%	Number	%		Number	%	Number	%		
Work pace						Role-clarity					
Low	352	64.1	197	35.9	<0.001	Low	255	41.6	358	58.4	
High	178	33.8	349	66.2		High	275	59.4	188	40.6	
Quantitative demands						Role-conflicts					
Low	314	65.4	166	34.6	<0.001	Low	340	63.9	192	36.1	
High	216	36.2	380	63.8		High	190	34.9	354	65.1	
Cognitive demands						Quality of leadership					
Low	298	55.5	239	44.5	<0.001	Low	191	38.7	303	61.3	
High	232	43.0	307	57.0		High	339	58.2	243	41.8	
Emotional demands						Social support from colleagues					
Low	378	68.4	175	31.6	<0.001	Low	269	47.4	298	52.6	
High	152	29.1	371	70.9		High	261	51.3	248	48.7	
Demands for hiding emotions						Social support from supervisors					
Low	306	63.5	176	36.5	<0.001	Low	263	44.6	327	55.4	
High	224	37.7	370	62.3		High	267	54.9	219	45.1	
Influence at work						Sense of community					
Low	234	45.9	276	54.1	0.04	Low	185	42.3	252	57.7	
High	296	52.3	270	47.7		High	345	54.0	294	46.0	
Possibilities for development						Insecurity over employment					
Low	241	44.3	303	55.7	0.001	Low	245	46.1	286	53.9	
High	289	54.3	243	45.7		High	285	52.3	260	47.7	
Control over working time						Insecurity over working conditions					
Low	279	47.5	308	52.5	0.22	Low	330	59.2	227	40.8	
High	251	51.3	238	48.7		High	200	38.5	319	61.5	
Meaning of work						Work-life conflict					
Low	280	42.9	373	57.1	<0.001	Low	349	66.6	175	33.4	
High	250	59.1	173	40.9		High	181	32.8	371	67.2	
Commitment to the workplace						Trust					
Low	163	31.8	349	68.2	<0.001	Low	178	34.5	338	65.5	
High	367	65.1	197	34.9		High	352	62.9	208	37.1	
Predictability						Organizational justice					
Low	214	37.5	356	62.5	<0.001	Low	146	30.4	335	69.6	
High	316	62.5	190	37.5		High	384	64.5	211	35.5	
Recognition						Job satisfaction					
Low	155	31.6	336	68.4	<0.001	Low	149	27.9	385	72.1	
High	375	64.1	210	35.9		High	381	70.3	161	29.7	

*Chi-square test.

factor analysis that was conducted in this study to determine model fit showed that there was an excellent fit in the model fit index values of factor structure consisting of 25 dimensions and 88 items.

The predictability dimension could assess the concept because the Cronbach's alpha value was 0.66 in this study. The Cronbach's alpha value of predictability dimension was 0.74, 0.75 and 0.70 in the Danish, German and French versions, respectively, which is consistent with this study.^{19–21} This study found that the Cronbach's alpha values of all other dimensions were higher than 0.70.

The COPSOQ-TR can assess many psychosocial factors, health and general well-being at the workplace based on the theory. The questionnaire includes different psychosocial factors, which are not found in the risk assessments to be performed based on the models. Because it was adapted into many languages, it allows the comparison of scores at national and international levels.²⁰ Kompier defined seven models, and

the psychosocial risks originating from the working environment are based on these models including; (i) job characteristics model, (ii) Michigan organizational stress model, (iii) job demands-control-social support model, (iv) sociotechnical approach, (v) action-theoretical approach, (vi) effort-reward imbalance model and (vii) vitamin model.²² The job diversity, autonomy and demands in the COPSOQ-TR are included in these seven models. Possibilities for development, influence at work, quantitative demands, social support and insecurity over work dimensions are also based on these models.²⁰ The meaning of work dimension is in accord with the concept of task identity that was included in the models.²⁰ The possibilities for development, job security and social support dimensions in COPSOQ-TR correspond to the concept of reward in the effort-reward imbalance model.²⁰ It also includes trust, organizational justice and sense of community dimensions, which allows assessing the concept of organizational social capital.²³

In addition, the COPSOQ-TR includes new psychosocial risk factors such as cognitive demands, emotional demands, demands for hiding emotions, predictability, recognition, role-clarity, role-conflict, and work-life conflict, which modern working life has created in recent years.²⁰ These factors are important, particularly for analyzing flexible work, service sector work and group work. Today, it is necessary to assess newly emerging psychosocial risks because of outsourcing, downsizing and other organizational trends that result from globalization.²⁰

COPSOQ-TR is can be examined in four groups of psychosocial factors: demands, interpersonal relationships and leadership, influence and development, other parameters and outcomes (Figure 1).^{24,25} Predictability, recognition, trust and organizational justice dimensions in interpersonal relations and leadership shared the same factor loading in the exploratory factor analysis. The organizational social capital concept, which defines mutual respect, trust and cooperation in interpersonal relations, is assessed with the dimensions of trust, organizational justice and sense of community in the COPSOQ-TR.²⁶

The psychosocial risk dimensions of COPSOQ-TR largely predicted the job satisfaction and burnout dimensions, which were assessed as dependent variables. The findings in this study imply that the items in the dimension of control over working time should be reassessed in future studies. Furthermore, the respondents that had low levels of insecurity over employment had high levels of burnout and low levels of job satisfaction ($p < 0.05$); the respondents that had high, insecurity over working conditions had high levels of burnout and low levels of job satisfaction ($p < 0.05$). Although both dimensions of insecurity over work in COPSOQ-TR (insecurity over employment and insecurity over working conditions) shared the same factor loading in exploratory factor analysis, their inverse relationships with the variables job satisfaction and burnout showed that these two dimensions provided more detailed information. These findings support that the insecurity over work dimension can be assessed individually (as insecurity over employment and insecurity over working conditions) in COPSOQ-TR.

Job Demands-Resources (JD-R) and Effort-Reward Imbalance (ERI) models are the most useful and valid stress models in work and organizational psychology and COPSOQ includes these models accurately.^{27,28} The scale were satisfactory and the COPSOQ could be integrated in the JD-R framework and its characteristics are satisfactory as well.²⁷ It is possible to find new

paths or modifiers and build new models by COPSOQ.²⁷

It is indicated that the effects of the psychosocial work conditions will be underestimated in some studies if one only includes the ERI and job strain models.²⁸ Some of the new COPSOQ dimensions like overcommitment, emotional demands, meaning of work or leadership change the effects of ERI and job strain.^{27,28} COPSOQ is also an instrument to share information and develop new interventions to prevent psychosocial risks in collaboration with institutions, public administrations and universities.²⁹ Moreover, the use of the questionnaire in many languages and countries allows making international comparisons. In addition, its comprehensive nature provides opportunities for establishing prevention programs at workplaces. The questionnaire is an assessment tool that will make important contributions to the development of national policies for monitoring psychosocial risks.²⁹

Strengths and limitations

The COPSOQ-3 is an assessment tool that has changed over time via the international communication network. So, this is one of the newest validation studies of COPSOQ-3. The main strength of the study is applying the questionnaire to people from different sectors (service and industry) and professions. This increases the validity of the questionnaire to use different settings. But we still recommended using this questionnaire in other sectors to improve its generalizability. One of the important limitations of our study was the lack of random sample selection. However, we believe that this will not make a major impact on the results of validation. Test-retest or inter-rater reliability could not be evaluated in the study since, it was inconvenient to obtain information about the participants' credentials for psychosocial risk assessment in workplaces.

Conclusions

This study examined the validity and reliability of COPSOQ-TR and found that the questionnaire was adapted successfully and that it measured the psychosocial concepts appropriately. The questionnaire involves a variety of dimensions, making it a useful tool for the assessment of comprehensive psychosocial risks at workplaces. The structure of the questionnaire enables using, dimensions by grouping or individually. Further studies should be conducted to update COPSOQ-TR in accordance with the international

version and to modify it by complying with the excluded or amended items and dimensions.

Disclosure statement

No potential conflict of interest was reported by the authors.

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