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RESEARCH ARTICLE

Validation of the Arabic Version of the Copenhagen Psychosocial Questionnaire II (A-COPSOQ II) among Workers in Oil and Gas Industrial Sector

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ABSTRACT

Introduction: The undisputed increase of the relevance of measuring the work-related psychosocial factors is confronted with a lack of qualified well-documented measuring instruments covering all important aspects.

Aim: To develop and validate a standardized Arabic version of the COPSOQ II for evaluating the psychosocial environment at the oil and gas workplace.

Method: COPSOQ network guidelines for validation studies were followed. The original Danish COPSOQ II (Long version) was meticulously translated and comprehensively validated among an adaptation sample of 500 oil and gas industry workers in the Suez Oil Processing Company in Egypt. Only 438 workers completed the questionnaire in Arabic and English languages with demonstrated sociodemographic data (Yielding a response rate of 87.6%). Psychometric properties of COPSOQ II scale items were depicted in terms of descriptive statistics, feasibility analysis, and internal consistency. Furthermore, A-COPSOQ II was tested for factorial validity using exploratory and confirmatory factor analysis.

Results: Mean age of the study participants was 35 ± 6 years. Scales of Arabic COPSOQ depicted a great Concordance and Reliability (C-α > 0.7). Content Validity Index (CVI) was estimated to be 0.87; ranging from 0.7 - 0.9. Models of exploratory factor analyses projected a reflective working model with reasonable results in 33 out of 41 overall scales. Confirmatory factor analysis revealed an acceptable fit (X^2 = 745.67, X^2/df = 2.09, SRMR = 0.058, CFI = 0.87).

Conclusion: Arabic version of COPSOQ II is a relevant and culturally accepted conceptual instrument for tracking psychosocial hazards and promoting a safe environment for all workers.

INTRODUCTION

Petroleum industry is an around-the-clock operation that requires extensive health and safety regulations to cope with anticipated challenges [1]. Employees are continuously exposed to numerous implicit psychosocial risks that include workflow, team assignment, and performance evaluations, all within social and economic contexts. Lack of prompt reporting and delayed communication between employees and supervisors may lead to catastrophic outcomes. This can easily put workers at a higher risk for work-related accidents including, but not restricted to, fire or explosions [2].

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In compliance with recent guidelines of the European Union Occupational Health and Safety at Work (EU-OSH 2014-2020) [3], many eclectic instruments (Primarily questionnaire-based) were developed and updated to tackle this sort of invisible risk, such as the Health and Safety Executive Indicator Tool [4], Work Environment Impact Scale [5], and Decent Work Questionnaire [6]. Most of these psychosocial questionnaires focused on one particular theory, or linked proposed theories with gross negligence of a certain factor [7].

Copenhagen Psychosocial Questionnaire (COPSOQ) declaimed scientific debate of measuring psychosocial factors at workplaces. It was first developed by the Danish National Research Centre in 1997 as an inferential tool for comprehensive multidimensional measure of both positive and negative psychosocial aspects of the workplace by Pejtersen and Kristensen [8]. First version (COPSOQ I) failed to address some of the important psychometric scales (including justice, rewards, and social trust). The second version of COPSOQ was then introduced in 2010 to manage COPSOQ I pitfalls [9]. COPSOQ International Network 2021 (http://www.copsoq-network.org) was created to promote scientific research in psychological risk assessment at the workplace. COPSOQ guidelines became standardized practice operating procedures for national companies around the globe. Since then, COPSOQ II has gained eminent recognition among researchers in the industrial community and has been translated to more than 25 languages to allow international comparisons. However, Arabic has not been among the national validated studies [10].

In Egypt, petroleum industry is one of the most important pillars of the national economy. Suez Oil Processing Company (SOPC) is one of the largest governmental oil and gas industry companies in Egypt and the Middle East with a considerable workforce of nearly 6,000 employees contributing 901,397 working hours per month [11]. These employees exposed to a high workload on a daily basis with subsequent consequences on their health and mental well-being, which will eventually affect the overall company productivity. Therefore, the purpose of this article to develop and validate an Arabic version of the second-long version of COPSOQ II.

METHODS

Study population

Cross-sectional study design (Site – Survey) was conducted among healthy professional and technical workers at the SOPC. They represented both sexes, and all worked 40 hours per week (Average 8 hours daily for 5 days per week). Exclusion criteria included the use of illicit drugs, suffering psychiatric or psychological illnesses, or women during pregnancy. Informed written consent was obtained per standards of the Ethics Committee of the Medical Research Institute (MRI approval number BI-51677801), and was coupled with the data collection sheets. By the end of the startup toolbox talk, each candidate was assigned to fulfill a sociodemographic datasheet (Including: age, sex, marital status, educational level, job descriptions, and sleep patten), English, and Arabic-drafted questionnaire. Participation was not compulsory. Out of 500 participants, only 438 workers delivered all documents in a sealed envelope to their team leader. Non-shared workers mentioned that the study tools are relatively lengthy and time-consuming, considering their urgent job duties.

Questionnaire development

The Arabic/English version was adapted to include 7 main domains with 127 items that cover main psychosocial metrics along with health and wellbeing.

Validation of A-COPSOQ psychometric proprieties comprised the following working steps:

Linguistic adaptation/translation: Forward-backward translation technique was meticulously conducted with the help of two masked certified translators who were selected independently from the English Literature and Arabic Literature Departments of Alexandria University. Then, translated version was subsequently checked by two safety managers. The final version was adopted after final adjudication between authors, translators, and managers to ensure authenticity and reach consensus over ambiguous terminologies [12].

Content/objectivity: Each item within each scale was evaluated for its clarity, relevance, applicability, comprehensiveness, and ease of understanding. Content validity was assessed to ensure the necessity of each item in the collected sample using qualitative and quantitative methods by five expert panel of psychologists (two), safety managers (two), and occupational health specialist (one). For qualitative evaluation, few items were substituted with other simpler texts. e.g., within (Interpersonal Relations and Leadership) scale, we displaced "Social Support from Colleagues" to "Horizontal Support"; "Social Support from Supervisors" to "Vertical Support" and "Social Community at work" to "Work Atmosphere" and within (Values at Workplace) scale, we displaced "mutual trust between employees" to "Horizontal Trust"; and "trust regarding management" to "Vertical Trust". For quantitative evaluation, we estimated both the Scale Content Validity Index (S-CVI) determined by estimating [The sum relevant proportional rating / (number of experts)] [13] and Content Validity Ratio (CVR) using this equation [14];

$$CVR = (Ne - N/2) / (N/2)$$

[Ne is the number of panelists indicating "essential" and N is the total number of panelists]

Measurements: Scoring of A-COPSOQ II follows the scoring manual of second-long version COPSOQ II with 41

psychometric scales. Each item was scored from 0-100 (i.e. 0, 25, 50, 75, and 100 for a five-response item; and 0, 33.3, 66.7, and 100 in the case of four response items). Mean items score was calculated per scale. The whole scale score was considered to be missing if participants had responded to less than fifty percent of the scale items [9]. Each scale score depicts the direction indicated by its name.

Flooring and ceiling effects: Scale items were evaluated for determining the questionnaire sensitivity by calculating the bottom (Flooring) effects and roof (Ceiling) effects [15].

Scale reliability: Internal consistency of scale dimensions was assessed using Cronbach's alpha (C-α). Inter-item correlation was analyzed using Corrected Item Total Correlation (CITC) to measure the contribution of each item in the overall scale-reliability. Correlation coefficient of 0.70 is the threshold value for assessing the questionnaire reliability [16]. An inter-item correlation was analyzed using Corrected Item Total Correlation (CITC) to measure the contribution of each item in the overall scale-reliability [17].

Construct and factorial validity: Factorial validity was assessed by the definition and evaluation of the domain structure of the A-COPSOQ II questionnaire using models of exploratory factor analysis [18]. Items of each psychometric domain were analyzed with determining its individual load within the seven major domains (Factors) independently. Principal component analysis using varimax rotation was determined for factor extraction. Domains enrolled in each model were selected based on Kaiser's criterion (Eigenvalues greater than one), graphical analysis of screen plot, the total variance explained (at least greater than 50%), and Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy. KMO values greater than 0.6 (Mediocre value) depict the appropriateness of conducting factor analysis. Bartlett's test of sphericity was used to test the identity of correlation matrices and significant values affirm a satisfactory factor analysis. Furthermore, confirmatory factor analysis was performed coupled with the discriminant validity measures using Average Variance Extracted (AVE) [Threshold value = 0.50] and Full Collinearity Variance Inflation (FVIF) [Acceptable limit < 2.5] [19]. The acceptable values of Comparative Fit Index (CFI) was determined at level > 0.90, and for Root Mean Square Residual (RMR), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) determined at level < 0.08. Factor loading values of 0.3 and more were considered a significant relationship between items and factors. The list-wise deletion method was used to handle the missing items wherever found [20].

Statistical analysis

Sociodemographic characteristics of the industrial workers were summarized using frequency, and percent. Quantitative data were described using the mean with Standard Deviation (SD) after data exploration using the Kolmogorov–Smirnov test (K–S test). Descriptive statistics (Mean ± SD) were illustrated the scores per item independently and the average scale as a whole. Matched-pair t-test was used to compare the mean scale item score between the two versions. Flooring and ceiling effects were described as a percent. Reliability and validity were assessed using the aforementioned appropriate tests. Statistical Package for Social Sciences (SPSS) v24.0* software program was used for all inferential statistics (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.). The significance level was determined below 5% and quoted as two-tailed hypothesis tests [21].

RESULTS

Table 1 summarizes the sociodemographic data of 438 shared participants. The majority of the study sample were male (n = 388, 88.6%). All the shift workers (n = 286, 65.3%) were professional males and exerted disturbed sleep patterns (n = 272, 62.10%). Mean age of participants was 35 years (SD = 6 years). About 91.0% of the participants were highly educated.

Reliability and summary statistics for COPSOQ II scales for both Arabic and English versions are illustrated in table 2. Average scores and standard deviations were described for each item per scale and for the scale as a whole measure to both versions. No missing values were reported in both versions. Most of the dimensions had low values of bottom and ceiling effects, except for some items of job security, and offensive behavior scales. Participants declared that the Arabic context is much easier in understanding and takes fewer minutes to be completed rather than the

Table 1: Sociodemographic data among Suez Oil Processing Company (SOPC) industrial workers.

Parameter	Descriptive Statistics (n = 438)
Age (Yrs):	
Mean ± SD	35.0 ± 6.0
Sex:	
Male	388 (88.6%)
Female	50 (11.4%)
Marital Status:	
Single	122 (27.8%)
Married	310 (70.7%)
Divorced	4 (1.0%)
Widow	2 (0.5%)
Educational Level:	
High	291(66.4%)
Higher Degrees (Diploma/MS/PhD)	147 (33.6%)
Job Title:	
Professional	341 (77.8%)
Technician	97 (22.2%)
Work Pattern:	
Day Work	152 (34.7%)
Shift Work	286 (65.3%)
Sleep Pattern:	
Disrupted	272 (62.1%)
Regular	166 (37.9%)

SD = Standard Deviation

Table 2: Reliability and summary statistics of COPSOQ II- Scales (n = 438).

	Scale/Items	Mean ± SD		% Floor		% Ceiling		CTIC & C-α**		Max/ Min
		A-COPSOQ	COPSOQ†	A-COPSOQ	COPSOQ†	A-COPSOQ	COPSOQ†	A-COPSOQ	COPSOQ†	
Demands at Work	**Quantitative Demands**	**(49.14 ± 3.12)***	**(45.24 ± 4.27)***					**(0.70)**	**(0.69)**	
	QD1- Is your workload unevenly distributed so it piles up?	44.56 ± 20.65	42.93 ± 19.80	5%	2 %	3%	3%	0.52	0.39	100/0
	QD2- How often do you not have time to complete all your work tasks?	52.89 ± 22.42	49. 27 ± 25.80	4%	12%	1%	1%	0.48	0.51	100/0
	QD3- Do you get behind with your work?	46.73 ± 23.16	40.39 ± 25.69	5%	10%	6%	7%	0.39	0.32	100/0
	QD4- Do you have enough time for your work tasks?	52.35 ± 22.58	48.36 ± 24.39	2%	9%	7%	1%	0.47	0.44	100/0
	Work Pace (Tempo)	**(62.62 ± 0.55)***	**(58.03 ± 3.52)***					**(0.73)**	**(0.68)**	
	WP1- Do you have to work very fast?	62.86 ± 23.83	58.33 ± 19.18	3%	1%	15%	4%	0.59	0.47	100/0
	WP2- Do you work at a high pace throughout the day?	63.95 ± 23.78	58.33 ± 23.46	2%	4%	17%	9%	0.37	0.32	100/0
	WP3- Is it necessary to keep working at a high pace?	61.05 ± 23.20	57.43 ± 24.05	2%	3%	12%	9%	0.56	0.47	100/0
	Cognitive Demands	**(69.70 ± 1.48)***	**(59.74 ± 0.37)***					**(0.84)**	**(0.74)**	
	CD1-Do you have to keep your eyes on lots of things while you work?	69.03 ± 32.32	59.42 ± 33.53	9%	9%	38%	29%	0.61	0.59	100/0
	CD2. Does your work require that you remember a lot of things?	68.29 ± 32.75	60.14 ± 36.07	9%	9%	38%	36%	0.61	0.60	100/0
	CD3. Does your work demand that you are good at coming up with new ideas?	69.75 ± 31.45	59.96 ± 35.55	7%	7%	37%	36%	0.64	0.53	100/0
	CD4. Does your work require you to make difficult decisions?	71.74 ± 31.51	59.42 ± 36.40	8%	10%	42%	36%	0.62	0.42	100/0
	Emotional Demands	**(70.15 ± 3.98)***	**(57.90 ± 5.89)***					**(0.71)**	**(0.62)**	
	ED1-Does your work put you in emotionally disturbing situations?	73.00 ± 23.60	58.16 ± 28.59	1%	4%	32%	16%	0.56	0.44	100/0
	ED2-Do you have to relate to other people's personal problems as part of your work?	64.67 ± 22.34	54.00 ± 28.82	2%	8%	16%	14%	0.41	0.39	100/0
	ED3-Is your work emotionally demanding?	69.75 ± 21.67	54.53 ± 25.13	1%	4%	21%	12%	0.37	0.46	100/0
	ED4-Do you get emotionally involved in your work?	73.19 ± 23.13	64.86 ± 27.95	0%	0%	33%	29%	0.53	0.37	100/25
	Demands for hiding emotions	**(68.56 ± 0.65)***	**(61.29 ± 5.14)***					**(0.72)**	**(0.68)**	
	HE1-Are you required to treat everyone equally, even if you do not feel like it?	68.48 ± 31.14	65.04 ± 32.47	4%	4%	36%	35%	0.50	0.38	100/0
	HE2-Does your work requires that you hide your feelings?	69.38 ± 28.50	55.43 ± 32.35	6%	7%	29%	24%	0.53	0.47	100/0
	HE3-Are you required to be kind and open towards everyone-regardless of how they behave towards you?	68.11 ± 28.78	63.41 ± 31.99	2%	4%	30%	32%	0.58	0.47	100/0
Work Organization and Job Content	**Influence**	**(52.26 ± 0.67)**	**(50.00 ± 0.25)**					**(0.90)**	**(0.87)**	
	IN1-Do you have a large degree of influence on the decisions concerning your work?	51.27 ± 14.59	49.64 ± 15.39	0%	0%	0%	0%	0.68	0.65	75/25
	IN2-Do you have a say in choosing who you work with?	52.53 ± 14.89	50.18 ± 15.25	0%	0%	0%	0%	0.65	0.62	75/25
	IN3-Can you influence the amount of work assigned to you?	52.23 ± 15.40	50.00 ± 15.40	0%	0%	0%	0%	0.62	0.59	75/25
	IN4-Do you have any influence on what you do at work?	52.72 ± 16.18	50.18 ± 16.40	0%	0%	0%	0%	0.62	0.59	75/25
	Possibilities for Development	**(32.11 ± 1.62)**	**(29.52 ± 2.16)**					**(0.748)**	**(0.713)**	
	PD1-Does your work requires you to take the initiative?	32.06 ± 28.97	30.79 ± 28.86	36%	34%	4%	4%	0.54	0.53	100/0
	PD2-Do you have the possibility of learning new things through your work?	29.89 ± 28.15	27.36 ± 26.14	30%	30%	3%	3%	0.44	0.36	100/0
	PD3-Can you use your skill or expertise in your work?	32.79 ± 31.79	28.07 ± 27.59	33%	34%	5%	3%	0.58	0.38	100/0
	PD4-Does your work gives you the opportunity to develop your skills?	33.69 ± 30.75	31.88 ± 29.09	35%	35%	6%	4%	0.66	0.58	100/0
	Variation	**(47.64 ± 1.79)**	**(43.84 ± 1.03)**					**(0.75)**	**(0.79)**	
	VA1-Is your work varied?	46.37 ± 19.23	44.56 ± 18.80	3%	3%	0%	0%	0.61	0.64	75/0
	VA2-Do you have to do the same thing over and over again?	48.91 ± 20.00	43.11 ± 18.80	4%	4%	0%	0%	0.61	0.64	75/0
	Meaning of Work	**(69.86 ± 7.82)**	**(67.21 ± 6.46)**					**(0.74)**	**(0.71)**	
	MW1-Is your work meaningful?	73.55 ± 30.47	71.56 ± 31.56	6%	7%	44%	43%	0.64	0.63	100/0
	MW2-Do you feel that the work you do is important?	74.82 ± 28.89	70.29 ± 31.76	7%	8%	40%	39%	0.67	0.61	100/0
	MW3-Do you feel motivated and involved in your work?	60.89 ± 20.24	59.78 ± 20.58	3%	3%	1%	1%	0.32	0.29	100/0

	Commitment to the Workplace	**(80.60 ± 5.93)**	**(79.75 ± 3.84)**					**(0.82)**	**(0.84)**	
	CW1-Do you enjoy telling others about your place of work?	77.73 ± 26.10	74.09 ± 28.56	4%	4%	45%	42%	0.62	0.69	100/0
	CW2-Do you feel that your place of work is of great importance to you?	75.00 ± 27.68	73.55 ± 28.29	4%	4%	41%	40%	0.58	0.64	100/0
	CW3-Would you recommend a good friend to apply for a position at your workplace?	76.81 ± 25.92	73.55 ± 28.62	4%	4%	42%	42%	0.60	0.64	100/0
	CW4-How often do you consider looking for work elsewhere?	87.31 ± 21.41	84.96 ± 24.82	2%	2%	65%	65%	0.49	0.47	100/0
	Predictability	**(30.97 ± 0.51)**	**(28.71 ± 0.38)**					**(0.76)**	**(0.83)**	
	PR1-At your place of work, are you informed well in advance concerning for example important decisions, changes, or plans for the future?	30.61 ± 25.09	28.98 ± 23.83	24%	24%	3%	3%	0.61	0.64	100/0
	PR2-Do you receive all the information you need in order to do your work well?	31.34 ± 27.03	28.44 ± 24.76	27%	27%	4%	4%	0.61	0.64	100/0
	Recognition (Reward)	**(54.23 ± 0.86)**	**(48.43 ± 0.84)**					**(0.70)**	**(0.68)**	
	RE1-Is your work recognized and appreciated by the management?	54.89 ± 33.07	48.91 ± 33.89	14%	14%	20%	20%	0.52	0.50	100/0
	RE2-Does the management at your workplace respect you?	53.26 ± 34.81	47.46 ± 34.74	18%	18%	17%	17%	0.523	0.48	100/0
	RE3-Are you treated fairly at your workplace?	54.52 ± 32.84	48.91 ± 33.48	12%	12%	20%	20%	0.48	0.49	100/0
	Role Clarity	**(30.00 ± 3.87)**	**(27.11 ± 2.64)**					**(0.70)**	**(0.67)**	
	CL1-Does your work have clear objectives?	26.72 ± 25.49	25.16 ± 24.09	38%	38%	1%	1%	0.51	0.55	100/0
	CL2-Do you know exactly which areas are your responsibility?	33.34 ± 31.15	28.98 ± 25.05	32%	32%	6%	6%	0.48	0.41	100/0
	CL3-Do you know exactly what is expected of you at work?	30.79 ± 26.38	28.26 ± 24.69	26%	26%	3%	3%	0.50	0.52	100/0
	Role Conflicts	**(49.55 ± 4.37)**	**(47.46 ± 3.68)**					**(0.73)**	**(0.68)**	
	CO1-Do you do things at work, which are accepted by some people but not by others?	49.64 ± 28.33	44.56 ± 27.31	10%	10%	8%	8%	0.61	0.31	100/0
	CO2-Are contradictory demands placed on you at work?	54.17 ± 30.59	52.72 ± 30.61	5%	5%	23%	23%	0.48	0.46	100/0
	CO3-Do you sometimes have to do things, which ought to have been done in a different way?	50.72 ± 25.62	47.28 ± 25.39	2%	3%	10%	10%	0.42	0.39	100/0
	CO4-Do you sometimes have to do things, which seem to be unnecessary?	43.66 ± 28.34	45.29 ± 28.74	11%	11%	11%	11%	0.60	0.32	100/0
	Quality of leadership	**(59.42 ± 4.66)**	**(57.97 ± 5.44)**					**(0.71)**	**(0.72)**	
	To what extent would you say that your immediate superior---									
	QL1-makes sure that the members of staff have good development opportunities?	60.69 ± 34.69	62.86 ± 34.07	9%	9%	36%	36%	0.52	0.57	100/0
	QL2-gives high priority to job satisfaction?	62.68 ± 31.71	59.42 ± 32.56	4%	4%	33%	33%	0.54	0.55	100/0
	QL3-is good at work planning?	52.54 ± 35.78	50.18 ± 36.43	14%	14%	28%	29%	0.46	0.48	100/0
	QL4-is good at solving conflicts?	61.77 ± 34.99	59.42 ± 35.51	9%	9%	36%	36%	0.39	0.41	100/0
	Social Support from Colleagues: "Horizontal Support"	**(38.70 ± 0.68)***	**(30.91 ± 0.71)***					**(0.78)**	**(0.77)**	
	SC1-How often do you get help and support from your colleagues if needed?	38.22 ± 25.84	30.80 ± 21.22	20%	20%	0%	0%	0.61	0.64	75/0
	SC2-How often are your colleagues willing to listen to your problems at work, if needed?	38.40 ± 26.01	31.70 ± 22.91	19%	22%	1%	1%	0.63	0.67	100/0
	SC3-How often do your colleagues talk with you about how well you carry out your work?	39.49 ± 26.13	30.25 ± 20.81	18%	20%	0%	0%	0.56	0.59	75/0
	Social Support from Supervisors: "Vertical Support"	**(42.74 ± 2.68)***	**(36.11 ± 1.45)***					**(0.80)**	**(0.76)**	
	SS1-How often is your nearest superior willing to listen to your problems at work, if needed?	40.76 ± 30.96	34.60 ± 28.23	27%	27%	3%	3%	0.640	0.37	100/0
	SS2- How often do you get help and support from your nearest superior, if needed?	41.67 ± 32.58	36.23 ± 27.10	27%	18%	8%	7%	0.692	0.65	100/0
	SS3-How often does your immediate superior talk with you about how well you carry out your work?	45.79 ± 28.71	37.50 ± 27.06	13%	16%	7%	7%	0.621	0.60	100/0
	Social Community at Work: "Work Atmosphere"	**(40.344 ± 0.52)***	**(34.72 ± 0.38)***					**(0.73)**	**(069)**	
	SW1-Is there a good atmosphere between you and your colleagues?	40.04 ± 28.42	34.60 ± 26.39	23%	25%	1%	1%	0.50	0.37	100/0
	SW2- Is there a good co-operation between the colleagues at work?	40.04 ± 28.42	34.42 ± 25.13	20%	22%	4%	1%	0.58	0.42	100/0
	SW3-Do you feel part of a community at your place of work?	40.94 ± 28.33	35.14 ± 25.38	20%	20%	3%	2%	0.56	0.43	100/0

Interpersonal Relationships and Leadership

Work-Individual Interface	**Job Insecurity: Are you worried about…?**	**(19.34 ± 3.30)**	**(18.25 ± 2.80)**					**(0.79)**	**(0.81)**	
	JI1-becoming unemployed?	15.39 ± 24.78	15.03 ± 23.50	69%	67%	0%	0%	0.52	0.65	75/0
	JI2-new technology making you redundant?	18.29 ± 20.25	17.39 ± 25.02	63%	63%	0%	0%	0.62	0.61	75/0
	JI3-it being difficult for you to find another job if you become unemployed?	23.18 ± 28.11	21.74 ± 26.64	54%	54%	0%	0%	0.60	0.64	75/0
	JI4-being transferred to another job against your will?	20.47 ± 27.39	18.84 ± 25.60	60%	60%	0%	0%	0.62	0.64	75/0
	Job Satisfaction: How pleased are you with…?	**(66.53 ± 15.26)**	**(64.72 ± 15.49)**					**(0.72)**	**(0.68)**	
	JS1-your work prospects?	74.64 ± 18.86	72.82 ± 21.03	0%	0%	22%	22%	0.64	0.65	100/25
	JS2-the people you work with?	43.65 ± 22.82	41.48 ± 22.09	0%	0%	5%	5%	0.39	0.36	100/25
	JS3-the physical working conditions?	74.82 ± 17.22	72.46 ± 20.55	0%	0%	20%	20%	0.63	0.65	100/25
	JS4-your job as a whole, everything is taken into consideration?	73.01 ± 17.10	72.10 ± 18.14	0%	0%	15%	15%	0.49	0.67	100/25
	Family-Work Conflict	**(63.05 ± 5.34)***	**(59.18 ± 6.16)***					**(0.79)**	**(0.67)**	
	WF1-Do you often feel a conflict between your work and your private life, making you want to be in both places at the same time?	66.90 ± 34.30	59.17 ± 34.89	10%	10%	43%	36%	0.62	0.42	100/0
	WF2-Do you feel that your work drains so much of my energy that it has a negative effect on your private life?	60.15 ± 36.15	54.58 ± 37.77	17%	19%	34%	33%	0.60	0.47	100/0
	WF3-Do you feel that your work takes so much of your time that it has a negative effect on your private life?	68.12 ± 35.72	67.88 ± 34.51	14%	13%	46%	42%	0.55	0.43	100/0
	WF4-.Do your friends or family tell you that you work too much?	57.00 ± 38.00	55.07 ± 39.19	23%	24%	32%	33%	0.64	0.50	100/0
	Family – Work Conflict	**(26.94 ± 1.20)**	**(25.36 ± 1.02)**					**(0.84)**	**(0.88)**	
	FW1-Do you feel that your private life takes so much of my energy that it has a negative effect on your work?	27.78 ± 29.49	26.81 ± 29.29	49%	50%	0%	0%	0.65	0.68	66.7/0
	FW2-Do you feel that your private life takes so much of your time that it has a negative effect on your work?	26.09 ± 28.70	24.64 ± 28.58	50%	53%	0%	0%	0.65	0.68	66.7/0
Values at Workplace	**Mutual Trust between Employees: "Horizontal Trust"**	**(76.57 ± 4.19)**	**(74.00 ± 4.76)**					**(0.721)**	**(0.697)**	
	HT1-Do the employees withhold information from the management?	78.80 ± 22.58	75.72 ± 26.83	2%	3%	39%	39%	0.59	0.52	100/0
	HT2-Do the employees withhold information from each other?	71.74 ± 28.78	68.66 ± 30.37	8%	8%	32%	32%	0.33	0.31	100/0
	HT3-Do the employees in general trust each other?	79.17 ± 22.32	77.72 ± 23.91	2%	1%	39%	40%	0.57	0.50	100/0
	Trust Regarding Management: "Vertical Trust"	**(75.50 ± 4.34)**	**(73.23 ± 4.42)**					**(0.71)**	**(0.65)**	
	VT1-Does the management withhold information from the employees?	76.81 ± 25.57	75.00 ± 27.52	4%	4%	38%	38%	0.60	0.51	100/0
	VT2- Does the management trust the employees to do their work well?	74.27 ± 28.48	71.74 ± 30.48	4%	4%	40%	40%	0.56	0.41	100/0
	VT3-Can you trust the information that comes from the management?	80.61 ± 20.71	78.26 ± 23.36	1%	1%	41%	41%	0.31	059	100/0
	VT4-Are the employees able to express their views and feelings?	70.29 ± 26.25	67.93 ± 28.49	3%	3%	27%	28%	0.51	0.39	100/0
	Justice	**(56.38 ± 3.76)**	**(55.34 ± 3.15)**					**(0.78)**	**(0.70)**	
	JU1-Are conflicts resolved in a fair way?	54.17 ± 27.94	53.94 ± 27.55	6%	4%	15%	16%	0.66	0.58	100/0
	JU2-Are employees appreciated when they have done a good job?	52.54 ± 29.88	51.81 ± 28.92	10%	10%	17%	15%	0.60	0.55	100/0
	JU3-Are all suggestions from employees treated seriously by the management?	57.97 ± 26.84	56.61 ± 27.52	2%	2%	18%	18%	0.60	0.41	100/0
	JU4.Is the work distributed fairly?	60.87 ± 28.17	59.06 ± 28.65	3%	3%	20%	20%	0.49	0.42	100/0
	Social Inclusiveness	**(54.00 ± 10.47)**	**(52.49 ± 10.95)**					**(0.72)**	**(0.67)**	
	SI1-Are men and women treated equally at your workplace?	61.77 ± 30.38	61.41 ± 30.37	6%	6%	27%	27%	0.54	0.55	100/0
	SI2- Is there space for employees of a different race and religion to express themselves?	64.13 ± 28.49	62.32 ± 29.48	1%	1%	30%	30%	0.48	0.40	100/0
	SI3- Is there space for elderly employees to express themselves?	43.48 ± 38.95	41.12 ± 37.94	38%	38%	15%	15%	0.39	0.40	100/0
	SI4-Is there space for employees with various occupational illness or disabilities to express themselves?	46.56 ± 38.23	45.10 ± 37.95	32%	33%	19%	19%	0.45	0.43	100/0
	General Health Perception	69.27 ± 11.82	69.21 ± 11.14	3%	3%	0%	0%			10/3

	Sleeping Troubles: How often ….	**(66.75 ± 4.91)**	**(66.26 ± 4.66)**					**(0.78)**	**(0.77)**	
	SL1-have you slept badly and restlessly?	69.20 ± 28.38	67.93 ± 28.81	5%	5%	30%	30%	0.65	0.65	100/0
	SL2- have you found it hard to go to sleep?	63.22 ± 29.00	62.68 ± 29.17	5%	5%	22%	22%	0.58	0.57	100/0
	SL3-have you woken up too early and not able to get back to sleep?	62.13 ± 28.85	62.32 ± 28.85	4%	4%	23%	23%	0.53	0.52	100/0
	SL4- have you woken up several times and found it difficult to get back to sleep?	72.46 ± 26.03	72.10 ± 26.17	3%	3%	32%	32%	0.49	0.46	100/0
	Burnout: How often ….	**(68.48 ± 2.92)**	**(67.48 ± 2.65)**					**(0.77)**	**(0.79)**	
	BO1-have you felt worn out?	68.11 ± 30.17	67.93 ± 30.20	7%	7%	33%	33%	0.48	0.52	100/0
	BO2-have you been physically exhausted?	67.21 ± 25.77	66.67 ± 26.22	3%	3%	25%	25%	0.57	0.59	100/0
	BO3-have you been emotionally exhausted?	65.94 ± 24.71	64.49 ± 25.24	4%	4%	19%	19%	0.63	0.67	100/0
	BO4-have you felt tired?	72.64 ± 23.37	70.83 ± 24.08	2%	2%	28%	28%	0.66	0.65	100/0
	Stress: How often ….	**(71.42 ± 1.76)**	**(69.56 ± 1.50)**					**(0.81)**	**(0.79)**	
	ST1- have you had problems relaxing?	69.02 ± 24.08	67.39 ± 25.20	1%	1%	25%	25%	0.57	0.53	100/0
	ST2-have you been irritable?	72.64 ± 23.95	70.47 ± 25.67	1%	1%	32%	32%	0.65	0.61	100/0
	ST3-have you been tense?	71.19 ± 23.76	69.75 ± 24.44	1%	1%	28%	28%	0.59	0.60	100/0
	ST4-have you been stressed?	72.83 ± 23.09	70.65 ± 24.52	1%	1%	30%	30%	0.67	0.64	100/0
	Depressive Symptoms: How often ….	**(51.68 ± 0.89)**	**(49.95 ± 0.62)**					**(0.87)**	**(0.90)**	
	DS1- have you felt sad?	50.36 ± 22.60	49.09 ± 21.87	7%	7%	4%	4%	0.64	0.67	100/0
	DS2-have you lacked self-confidence?	52.17 ± 22.09	50.18 ± 21.68	6%	6%	5%	5%	0.69	0.67	100/0
	DS3-have you had a bad conscience or felt guilty?	51.99 ± 24.55	50.54 ± 23.68	10%	10%	4%	4%	0.67	0.68	100/0
	DS4-have you lacked interest in everyday things?	52.17 ± 22.09	50.00 ± 21.14	7%	7%	4%	4%	0.68	0.63	100/0
	Somatic Stress: How often ….	**(54.84 ± 3.21)**	**(54.03 ± 4.12)**					**(0.72)**	**(0.71)**	
	SO1- have you had a stomach ache?	52.89 ± 25.99	50.90 ± 25.52	7%	7%	9%	9%	0.57	0.60	100/0
	SO2- have you had a headache?	52.89 ± 24.74	51.63 ± 23.44	4%	4%	7%	7%	0.57	0.61	100/0
	SO3-have you had palpitations?	59.96 ± 20.99	59.60 ± 20.61	1%	1%	8%	8%	0.48	0.68	100/0
	SO4-have you had tension in various muscles?	53.98 ± 24.58	53.62 ± 24.45	7%	7%	7%	7%	0.59	0.64	100/0
	Cognitive Stress: How often ….	**(73.46 ± 1.35)**	**(72.91 ± 1.16)**					**(0.72)**	**(0.71)**	
	CS1-have you had problems concentrating?	74.47 ± 24.06	73.91 ± 24.51	4%	4%	30%	30%	0.56	0.54	100/25
	CS2- have you found it difficult to think clearly?	72.28 ± 23.91	71.92 ± 24.06	4%	4%	25%	25%	0.51	0.51	100/0
	CS3- have you had difficulty in taking decisions?	72.64 ± 26.14	71.92 ± 26.58	5%	5%	30%	30%	0.52	0.50	100/0
	CS4- have you had difficulty with remembering?	74.45 ± 24.99	73.75 ± 25.51	7%	7%	28%	28%	0.53	0.52	100/0
	Self-efficacy: How well do these descriptions fit you as a person?	**(60.95 ± 0.95)**	**(62.98 ± 0.85)**					**(0.86)**	**(0.85)**	
	SE1-I am always able to solve difficult problems if I try hard enough?	62.31 ± 26.55	62.88 ± 26.55	4%	4%	19%	19%	0.63	0.62	100/0
	SE2-If people work against me, I find a way of achieving what I want?	62.50 ± 24.95	62.14 ± 24.77	5%	5%	12%	12%	0.57	0.57	100/0
	SE3-It is easy for me to stick to my plans and reach my objectives?	62.13 ± 26.20	62.68 ± 26.20	5%	5%	17%	17%	0.63	0.62	100/0
	SE4-I feel confident that I can handle unexpected events?	64.67 ± 26.11	64.49 ± 25.77	5%	5%	18%	18%	0.60	0.58	100/0
	SE5-When I have a problem, I can usually find several ways of solving it?	63.40 ± 22.43	62.50 ± 22.48	3%	3%	9%	9%	0.47	0.44	100/0
	SE6-Regardless of what happens, I usually manage?	62.68 ± 25.13	63.40 ± 25.12	6%	6%	11%	11%	0.53	0.50	100/0
Offensive Behaviour	**Sexual Harassment (SH1)** Have you been exposed to undesired sexual attention at your workplace during the last 12 months?	1.63 ± 8.11	1.63 ± 8.11	96%	96%	0%	0%			50/0
	Threats of Violence (TV1) Have you been exposed to threats of violence at your workplace during the last 12 months?	19.87 ± 5.79	19.89 ± 6.88	92%	91%	0%	0%			75/0
	Physical Violence (PV1) Have you been exposed to physical violence at your workplace during the last 12 months?	21.09 ± 6.88	21.14 ± 7.06	90%	89%	0%	0%			75/0
	Bullying (BU1) Have you been exposed to bullying at your workplace during the last 12 months?	15.76 ± 7.53	15.57 ± 7.22	73%	73%	0%	0%			75/0
	Unpleasant Teasing (UT1) Have you been exposed to unpleasant teasing at your workplace during the last 12 months?	29.68 ± 1.28	29.42 ± 1.11	65%	65%	0%	0%			75/0
	Conflicts and Quarrels (CQ1) Have you been exposed to conflicts and quarrels at your workplace during the last 12 months?	31.51 ± 1.73	31.42 ± 1.01	66%	65%	0%	0%			75/0
	Gossip and Slander (GS1) Have you been exposed to gossip and slander at your workplace during the last 12 months?	28.94 ± 4.49	28.35 ± 3.55	79%	80%	0%	0%			75/0

A-COPSOQ: Arabic Version; COPSOQ†: English Version; CTIC: Corrected Total Item Correlation; C-α: Cronbach's Alpha
*Significance of the mean scale items between the two versions using Matched-pair t-test: Nonsignificant ($p < 0.001$)

English draft. However, they did not exert much difference in the mean scale item scores except for demands at work, social support, and work-family conflict items ($p < 0.001$). A-COPSOQ II depicted greater values of Cronbach's alpha exceeding the threshold value of 0.7. According to the standard interpretation of inter-item correlations, all CITC coefficient values were good (where r > 0.30). For quantitative measuring of content validity index and ratio to the scales holistically; S-CVI [0.87; ranged (0.7 - 0.9)] and CVR [0.75; ranged (0.67 - 0.99)] showed satisfactory results. Most of the dimensions had low values of bottom and ceiling effects, except for some items of job security, and offensive behavior scales.

Results of exploratory and confirmatory factor analyses were summarized in table 3. Kaiser-Meyer-Olkin (KMO) coefficient was 0.897, 95% CI [0.825 – 0.920] and Bartlett test was statistically significant. Principal component analysis using varimax rotation showed that 33 scales out of 41 total scales strengthen the hypothesized scale structure explaining 67% of the total variance. Factor loadings per item were greater than 0.3 except for Work Pace item (WP2), Possibilities For Development items (PD3 and PD4), Meaning Of Work item (MW3), Quality Of Leadership items (QL3 and QL4), Vertical Trust items (VT2 and VT3), and Threats of Violence (TV). Confirmatory factor analysis demonstrated that the model had an adequate fit. *Chi-square* fit value of the included seven dimensions was statistically significant ($X2 = 745.67$, $X^2/df = 2.09$, $p < 0.001$). Goodness of fit index values were 0.039 for RMSEA, 0.052 for RMR, 0.058 for SRMR, and 0.87 for CFI. The error variance exerted moderate-level error and dimension coexistence was observed in other item-dimensions. Average variance extracted showed a reasonable value and for the FVIF, all scales demonstrate values less than the critical threshold.

DISCUSSION

Globally, there is a lack of managerial prioritization given to the psychosocial risk factors and their negative consequences on industrial workers with focusing on the company financial profits [2]. Results showed a reliable conceptual structure of A-COPSOQ psychometrics with comprehensive appraisal of dimensionality and internal consistency. Inter-item correlation coefficients were greater than 0.3, indicating an adequate convergent validity of the psychometric scales. However, none of the items had high CITC (r > 0.7), which confirms the proposed poor multicollinearity assumption for exploratory factor analysis [22].

Factorial validity hypothesized that out of the 41 total scales, 33 were based on a formative measurement model with all included items as psychometric indicators for the whole implicit domain. The other eight scales did not exhibit an obvious psychometric indication by checking exploratory factor models. They may exhibit a formative model if the scale items are combined together to yield a hypothetical common effect. Thorsen and Bjorner reported that scales of meaning of work and stress symptoms are supposed to explain a reflective model rather than the formative measurement model [23]. Furthermore, the conducted confirmatory factor analysis showed an acceptable model fit. We also evaluated the convergent validity via using the criteria of AVE and resulted that all reflective constructs have achieved the AVE value of 0.50, hence verifying that all constructs had met the requirement of convergent validity [13,19]. Full Collinearity (FVIF) indicated ascertainment of discriminant validity because all the estimated subscale values of FVIF were less than five as shown in table 3.

There is a debate around the standard psychometric adoption and validation of some COPSOQ II domains (e.g.,

Table 3: Construct validity Using Confirmatory Factor Analysis (CFA) of A-COPSOQ II- Scales ($n = 438$).

Scale/Items		CFA			AVE	FVIF
		loadings	Error Var.	R^2		
Demands at Work	**Quantitative Demands**					
	QD1	0.679	0.22	0.65		
	QD2	0.601	0.38	0.58	0.531	1.751
	QD3	0.663	0.43	0.40		
	QD4	0.591	0.26	0.46		
	Work Pace (Tempo)					
	WP1	0.643	0.29	0.68		
	WP2	**0.289**	0.30	0.55	0.580	1.800
	WP3	0.631	0.40	0.70		
	Cognitive Demands					
	CD1	0.890	0.32	0.80		
	CD2	0.803	0.38	0.82	0.809	2.095
	CD3	0.789	0.41	0.68		
	CD4	0.831	0.40	0.77		

	Emotional Demands					
	ED1	0.740	0.47	0.60		
	ED2	0.713	0.58	0.72	0.711	2.080
	ED3	0.709	0.57	0.67		
	ED4	0.721	0.61	0.69		
	Demands for Hiding Emotions					
	HE1	0.629	0.32	0.68		
	HE2	0.619	0.29	0.59	0.634	1.895
	HE3	0.672	0.38	0.70		
Work Organization & Job Contents	**Influence**					
	IN1	0.940	0.18	0.65		
	IN2	0.923	0.24	0.68	0.902	1.991
	IN3	0.890	0.31	0.71		
	IN4	0.884	0.28	0.69		
	Possibilities for Development					
	PD1	0.603	0.29	0.68		
	PD2	0.587	0.31	0.55	0.620	1.790
	PD3	**0.298**	0.28	0.49		
	PD4	**0.271**	0.43	0.70		
	Variation					
	VA1	0.790	0.32	0.56	0.590	2.081
	VA4	0.731	0.30	0.67		
	Meaning of Work					
	MW1	0.740	0.27	0.73		
	MW2	0.688	0.28	0.69	0.841	1.480
	MW3	**0.264**	0.31	0.49		
	Commitment to the Workplace					
	CW1	0.829	0.31	0.68		
	CW2	0.899	0.19	0.70	0.674	1.995
	CW3	0.902	0.26	0.71		
	CW4	0.679	0.27	0.59		
	Predictability					
International Relations & Leadership	PR1	0.679	0.22	0.63	0.701	1.009
	PR2	0.691	0.18	0.66		
	Recognition					
	RE1	0.732	0.29	0.68		
	RE2	0.689	0.30	0.75	0.680	1.890
	RE3	0.722	0.21	0.80		
	Role Clarity					
	CL1	0.790	0.31	0.70		
	CL2	0.603	0.28	0.72	0.819	1.895
	CL3	0.731	0.20	0.77		
	Role Conflicts					
	CO1	0.730	0.37	0.60		
	CO2	0.613	0.58	0.62	0.711	1.989
	CO3	0.629	0.37	0.67		
	CO4	0.727	0.41	0.59		
	Quality of Leadership					

	QL1	0.579	0.12	0.68		
	QL2	0.569	0.29	0.59	0.714	1.855
	QL3	**0.258**	0.31	0.61		
	QL4	**0.254**	0.18	0.66		
	Social Support from Colleagues					
	SC1	0.840	0.48	0.75		
	SC2	0.920	0.26	0.68	0.821	1.981
	SC3	0.824	0.29	0.69		
	Social Support from Supervisors					
	SS1	0.633	0.23	0.68		
	SS2	0.787	0.21	0.59	0.700	1.021
	SS3	0.801	0.13	0.70		
	Social Community at Work					
	SW1	0.729	0.41	0.58		
	SW2	0.799	0.29	0.65	0.614	1.455
	SW3	0.669	0.47	0.559		
Work – individual interface	**Job Insecurity**					
	JI1	0.901	0.20	0.65		
	JI2	0.821	0.18	0.78	0.801	1.051
	JI3	0.823	0.21	0.70		
	JI4	0.831	0.22	0.66		
	Job Satisfaction					
	JS1	0.863	0.29	0.68		
	JS2	0.889	0.10	0.75	0.680	1.902
	JS3	0.890	0.21	0.89		
	JS4	0.730	0.09	0.59		
	Work-Family Conflict					
	WF1	0.790	0.32	0.81		
	WF2	0.800	0.28	0.78	0.909	1.289
	WF3	0.689	0.31	0.68		
	WF4	0.791	0.28	0.77		
	Family–Work Conflict					
	FW1	0.929	0.12	0.78	0.890	1.032
	FW2	0. 972	0.19	0.80		
Values at Workplace	**Horizontal Trust**					
	HT1	0.740	0.26	0.64		
	HT2	0.932	0.30	0.68	0.702	1.491
	HT3	0.894	0.28	0.69		
	Vertical Trust					
	VT1	0.603	0.29	0.48		
	VT2	**0.287**	0.51	0.55	0.557	2.290
	VT3	**0.278**	0.28	0.49		
	VT4	0.431	0.43	0.51		
	Justice					
	JU1	0.821	0.37	0.73		
	JU2	0.788	0.28	0.69	0.690	1.280
	JU3	0.701	0.40	0.98		
	JU4	0.764	0.31	0.49		

	Social Inclusiveness					
	SI1	0.729	0.50	0.68		
	SI2	0.723	0.33	0.59	0.574	1.277
	SI3	0.801	0.26	0.71		
	SI4	0.639	0.47	0.59		
	Sleeping Troubles					
Health and Well-being	SL1	0.719	0.22	0.63		
	SL2	0.743	0.34	0.61	0.801	1.909
	SL3	0.731	0.31	0.59		
	SL4	0.691	0.18	0.66		
	Burnout					
	BO1	0.632	0.29	0.58		
	BO2	0.589	0.30	0.55	0.560	2.003
	BO3	0.534	0.42	0.65		
	BO4	0.702	0.21	0.80		
	Stress					
	ST1	0.730	0.31	0.70		
	ST2	0.803	0.28	0.72	0.719	1.395
	ST3	0.670	0.12	0.68		
	ST4	0.491	0.20	0.77		
	Depressive Symptoms					
	DS1	0.930	0.17	0.67		
	DS2	0.923	0.18	0.69	0.913	1.982
	DS3	0.929	0.20	0.65		
	DS4	0.927	0.18	0.72		
	Somatic Stress					
	SO1	0.675	0.17	0.72		
	SO2	0.667	0.23	0.69	0.832	1.689
	SO3	0.657	0.30	0.71		
	SO4	0.653	0.16	0.66		
	Cognitive Stress					
	CS1	0.710	0.28	0.75		
	CS2	0.731	0.26	0.68	0.721	1.781
	CS3	0.723	0.34	0.80		
	CS4	0.724	0.29	0.69		
	Self-Efficacy					
	SE1	0.729	0.41	0.598		
	SE2	0.679	0.29	0.656	0.734	1.232
	SE3	0.731	0.28	0.751		
	SE4	0.717	0.26	0.689		
	SE5	0.753	0.34	0.808		
	SE6	0.669	0.47	0.559		
Offensive Behaviour	**Sexual Harassment (SH)**	0.670	0.23	**0.75**		
	Threats of Violence (TV)	**0.231**	0.20	0.65		
	Physical Violence (PV)	0.821	0.18	0.78		
	Bullying (BU)	0.929	0.12	0.78	0.890	1.032
	Unpleasant Teasing (UT)	0.621	0.34	0.57		
	Conflicts & Quarrels (CQ)	0.632	0.23	0.76		
	Gossip & Slander (GS)	0. 672	0.19	0.80		

AVE: Average Variance Extracted; FVIF: Full Collinearity Variance Inflation

internal consistency and exploratory factor analysis) because they appear to be not as robust to measure the hypothetical common effects of combined items. The average scores and standard deviations showed similar results to the original Danish study [9], except for 8 scales, especially for work organizations and job contents, International relations and leadership, and values at work. These scales exerted some dissimilarity with the French version [24], Spanish [25], Iranian [26], Portuguese [27], Polish [28], Malayian [29] and other published new validated versions of the questionnaire in COPSOQ International Network [30]. We hypothesize that this is attributed to the nature of the petroleum industry workplace, and discrepancy of the labor market with subsequent feeling of job insecurity which in turn has a significant drawback on workers' health and well-being [31]. As for ceiling and flooring effects, they exhibit reasonable and comparable values. Since high values lead to insensitivity to realistic distributed answers and indicators of hypothetical shortcomings with the item's wording [19]. One of the main limitations of this study is the fact that it was based on an adaptation sample, with voluntary participation.

SIGNIFICANCE OF THIS STUDY

We delivered the questionnaire in both English and Arabic versions and compared the concordance and reliability to encourage the workers being involved in developing such instrument and to be counted in the psychosocial preventive policy establishment

Furthermore, this study represents the first Arabic validated translation of the COPSOQ II, which enable researchers and statisticians to conduct further studies in other work settings to ensure decent work environment for all employees, and enhance productivity and economy by empowering workers' mental health.

References

1. Aminian M, Dianat I, Miri A, Asghari-Jafarabadi M. The Iranian version of the Copenhagen Psychosocial Questionnaire (COPSOQ) for assessment of psychological risk factors at work. Health Promot Perspect. 2016 Dec 18;7(1):7-13. doi: 10.15171/hpp.2017.03. PMID: 28058236; PMCID: PMC5209652.
2. Ayre C, Scally A. Critical Values for Lawshe's Content Validity Ratio. Meas Eval Couns Dev. 2018;47(1):79-86. doi: 10.1177/0748175613513808.
3. Behr D, Sha M. Introduction: Translation of questionnaires in cross-national and cross-cultural research. Int J Transl Interpreting Res. 2018;10(2):1-4. doi:10.12807/ti.110202.2018.a01.
4. Bergh LIV, Leka S, Zwetsloot GIJM. Tailoring Psychosocial Risk Assessment in the Oil and Gas Industry by Exploring Specific and Common Psychosocial Risks. Saf Health Work. 2018 Mar;9(1):63-70. doi: 10.1016/j.shaw.2017.05.001. Epub 2017 May 10. PMID: 30363066; PMCID: PMC6111110.
5. Bonett D, Wright T. Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. J Organ Behav. 2014;36(1):3-15. doi:10.1002/job.1960.
6. Burr H, Berthelsen H, Moncada S, Nübling M, Dupret E, Demiral Y, Oudyk J, Kristensen TS, Llorens C, Navarro A, Lincke HJ, Bocéréan C, Sahan C, Smith P, Pohrt A; international COPSOQ Network. The Third Version of the Copenhagen Psychosocial Questionnaire. Saf Health Work. 2019 Dec;10(4):482-503. doi: 10.1016/j.shaw.2019.10.002. Epub 2019 Nov 6. PMID: 31890332; PMCID: PMC6933167.
7. Chen H, Wang F. Wisdom: Structure, Category, Measurement and Relationships to Related Variables. Adv Psychol Sci. 2013;21(1):108-117. doi:10.3724/sp.j.1042.2013.00108.
8. COPSOQ International Network. COPSOQ: What is it? [Online]. 24 March 2021. https://bit.ly/35f0ryo
9. Corner RA, Kielhofner G, Lin FL. Construct validity of a work environment impact scale. Work. 1997;9(1):21-34. doi: 10.3233/WOR-1997-9104. PMID: 24441922.
10. Cronbach L. Coefficient alpha and the internal structure of tests. Psychometrika. 1951;16(3):297-334. doi: 10.1007/bf02310555.
11. Dupret E, Bocéréan C, Teherani M, Feltrin M, Pejtersen JH. Psychosocial risk assessment: French validation of the Copenhagen Psychosocial Questionnaire (COPSOQ). Scand J Public Health. 2012 Jul;40(5):482-90. doi: 10.1177/1403494812453888. Epub 2012 Jul 24. PMID: 22833558.
12. Egypt Oil & Gas. Suez oil Processing Company (SOPC) [Online]. 24 March 2021. https://bit.ly/3pSyKVJ
13. EU-OSH (European Union Occupational Health and Safety at Work): EU Strategic Framework on Health and Safety at Work 2014-2020. In: The Commission to the European Parliament, Document no. 52014DC0332. 24 March 2021. https://bit.ly/3pPOmt1
14. Ferraro T, Pais L, Rebelo Dos Santos N, Moreira J. The Decent Work Questionnaire: Development and validation in two samples of knowledge workers. Int Labour Rev. 2018;157(2):243-65. doi:10.1111/ilr.12039.
15. Flora DB, Labrish C, Chalmers RP. Old and new ideas for data screening and assumption testing for exploratory and confirmatory factor analysis. Front Psychol. 2012 Mar 1;3:55. doi: 10.3389/fpsyg.2012.00055. PMID: 22403561; PMCID: PMC3290828.
16. Frot B, Nandy P, Maathuis M. Robust causal structure learning with some hidden variables. J R Stat Soc: Series B (Stat Methodol). 2019;81(3):459-487. doi:10.1111/rssb.12315.
17. Isha ASN, Javaid MU, Zaib Abbasi A, Bano S, Zahid M, Memon MA, Rehman U, Nübling M, Sabir AA, Ur Rehman S, Imtiaz N. Malay Validation of Copenhagen Psychosocial Work Environment Questionnaire in Context of Second Generation Statistical Techniques. Biomed Res Int. 2020 Feb 3;2020:7680960. doi: 10.1155/2020/7680960. PMID: 32090111; PMCID: PMC7025471.
18. Jensen MP. Questionnaire validation: a brief guide for readers of the research literature. Clin J Pain. 2003 Nov-Dec;19(6):345-52. doi: 10.1097/00002508-200311000-00002. PMID: 14600534.
19. Knekta E, Runyon C, Eddy S. One Size Doesn't Fit All: Using Factor Analysis to Gather Validity Evidence When Using Surveys in Your Research. CBE Life Sci Educ. 2019 Mar;18(1):rm1. doi: 10.1187/cbe.18-04-0064. PMID: 30821600; PMCID: PMC6757227.
20. Kongsvik T, Gjøsund G, Vikland K. HSE culture in the petroleum industry: Lost in translation?. Saf Sci. 2016;81(1): 81-89. doi: 10.1016/j.ssci.2015.04.019.
21. Kortum E, Leka S. Tackling psychosocial risks and work-related stress in developing countries: The need for a multilevel intervention framework. Int J Stress Manag. 2014;21(1): 7-26. doi: 10.1037/a0035033.
22. Lachenbruch P, Cohen J. Statistical Power Analysis for the Behavioral Sciences (2nd Ed.). J Am Stat Assoc. 1989;84(408):1096. doi: 10.2307/2290095.
23. Marcatto F, Colautti L, Larese Filon F, Luis O, Ferrante D. The HSE Management Standards Indicator Tool: concurrent and construct validity. Occup Med (Lond). 2014 Jul;64(5):365-71. doi: 10.1093/occmed/kqu038. Epub 2014 Mar 22. PMID: 24659107.
24. Moncada S, Utzet M, Molinero E, Llorens C, Moreno N, Galtés A, Navarro A. The copenhagen psychosocial questionnaire II (COPSOQ II) in Spain--a tool for psychosocial risk assessment at the workplace. Am J Ind Med. 2014 Jan;57(1):97-107. doi: 10.1002/ajim.22238. Epub 2013 Sep 6. PMID: 24009215.
25. Pejtersen JH, Kristensen TS. The development of the psychosocial work environment in Denmark from 1997 to 2005. Scand J Work Environ Health. 2009 Jul;35(4):284-93. doi: 10.5271/sjweh.1334. Epub 2009 May 29. PMID: 19479116.
26. Pejtersen JH, Kristensen TS, Borg V, Bjorner JB. The second version of the Copenhagen Psychosocial Questionnaire. Scand J Public Health. 2010 Feb;38(3 Suppl):8-24. doi: 10.1177/1403494809349858. PMID: 21172767.
27. Rosário S, Azevedo LF, Fonseca JA, Nienhaus A, Nübling M, da Costa JT. The Portuguese long version of the Copenhagen Psychosocial Questionnaire II (COPSOQ II) - a validation study. J Occup Med Toxicol. 2017 Aug 9;12:24. doi: 10.1186/s12995-017-0170-9. PMID: 28808478; PMCID: PMC5550997.

28. Šimkovic M, Träuble B. Robustness of statistical methods when measure is affected by ceiling and/or floor effect. PLoS One. 2019 Aug 19;14(8):e0220889. doi: 10.1371/journal.pone.0220889. PMID: 31425561; PMCID: PMC6699673.

29. Thorsen SV, Bjorner JB. Reliability of the Copenhagen Psychosocial Questionnaire. Scand J Public Health. 2010 Feb;38(3 Suppl):25-32. doi: 10.1177/1403494809349859. PMID: 21172768.

30. Widerszal-Bazyl M. Kopenhaski Kwestionariusz Psychospołeczny (COPSOQ) – właściwości psychometryczne wybranych skal w polskiej wersji [Copenhagen Psychosocial Questionnaire (COPSOQ) - Psychometric properties of selected scales in the Polish version]. Med Pr. 2017 May 16;68(3):329-348. Polish. doi: 10.13075/mp.5893.00443. Epub 2017 Apr 5. PMID: 28512362.

31. Yusoff M. ABC of Content Validation and Content Validity Index Calculation. Educi Med J. 2019;11(2):49-54. doi:10.21315/eimj2019.11.2.6.

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