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Psychometric properties of the Greek Culture and Climate Scale for assessing the working conditions of midwives

V. Vivilaki,[1]
C. Athanasiadou,[1]
E. Zemperligkou,[1]
M. Stamatopoulou,[2]
P. Springer,[3]
P. Prezerakos[2]

[1]Department of Midwifery, Technological Educational Institute of Athens, Athens, Greece
[2]Laboratory of Integrated Health Care, Faculty of Nursing, University of the Peloponnese, Sparta, Greece
[3]St Luke's Health System, Kansas City, MO, USA

OBJECTIVE **Psychometric evaluation of the Greek version of the Culture/Climate Assessment Scale (CCAS) for assessing the working conditions of midwives. This instrument was developed to measure communication, decision support, level of conflict, teamwork, general work satisfaction, and the personal level of stress, perceived level of change and overall level of morale within an organization.** METHOD **A cross-sectional study using the Greek CCAS was conducted in the two largest public maternity hospitals in Athens, Greece. After translation and reconciliation processing of the instrument, a pilot study was conducted on a convenience sample of midwives to finalize the Greek version. During the period May 2013 to February 2014, all eligible midwives (123) in the two hospitals were invited to complete the questionnaire, of which 23 declined for a range of reasons (response rate: 81.3%). Cronbach's alpha and Guttman split-half coefficients were calculated to assess the reproducibility and internal consistency of the scale. Exploratory and confirmatory factor analysis was conducted in order to check the structural validity of the scale.** RESULTS **Exploratory factor analysis (EFA) confirmed the multidimensionality of the Greek scale, revealing 7 orthogonal factors. The 7 factor model offered a very good fit with the data as assessed by confirmatory factor analysis (CFA). The values for Cronbach's alpha and Guttmann split-half coefficients were 0.878 and 0.757, respectively.** CONCLUSIONS **The Greek version of the CCAS provides an acceptable level of reliability and validity for assessment of the organizational culture and climate in the work environment of midwifery staff. Use of this scale will enable further exploration of the factors that determine the working conditions and affect the job satisfaction of midwives in Greece.**

Ψυχομετρικές ιδιότητες της ελληνικής κλίμακας κουλτούρας και κλίματος για την αξιολόγηση των συνθηκών εργασίας των μαιών

Περίληψη στο τέλος του άρθρου

Key words

Culture/Climate Assessment Scale (CCAS)
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Validity

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The optimal functioning of an organization is the most important goal of its leadership. The main factors contributing to the balanced functioning of an organization are the organizational culture and the climate prevailing in the organization. The culture and climate in health service organizations determine the quality of the health services provided, employee morale, the acceptance of innovations and the overall effectiveness of the organization.[1–3]

Studies conducted in hospitals in the past showed a strong connection between specific factors in the working environment and the quality of health care.[2–4] A good job environment is associated with a higher degree of empowerment, which, in turn, is related to lower levels of burnout in nursing staff.[5] In addition, it has been demonstrated that teamwork in the organization is the key to the effectiveness and is closely linked to communication and collaboration between health professionals.[6] Conversely, it has been observed that the phenomenon of professional conflict often leads to negative performance. The organizational culture and climate appear to be critical in specific areas which have been identified, including communication, decision support, level of conflict, teamwork and general work satisfaction, which may all be important factors contributing to the level of personal stress among the health care personnel.[4,7] A positive relationship has also been confirmed between the organizational climate and clinical competence.[8]

The Culture/Climate Assessment Scale (CCAS)[4] was developed to measure decision support, communication, teamwork, work satisfaction and level of conflict, perceived

level of change, personal level of stress and overall level of morale within an organization. The purpose of this study was translation of the CCAS into Greek and validation of the translated version. Specifically, the study aimed to: (a) test the Greek translation of the CCAS and confirm its reliability, and (b) examine the structural validity of the Greek CCAS.

MATERIAL AND METHOD

Study population

A cross-sectional study was conducted in the two largest public maternity hospitals in Greece, which serve both the population of Athens and some women from the rural areas of Greece. During the recruitment period (May 2013 to February 2014), all eligible midwives employed in the two hospitals were invited to participate. The eligibility criteria were: (a) Age between 22 and 60 years, (b) possibility for interview away from the chief midwife and other midwives working in the same department, (c) fluency in spoken and written Greek, and (d) provision of informed consent. A total of 123 midwives met the eligibility criteria and were encouraged to participate in the study, of which 23 declined to participate for a variety of reasons (response rate: 81.3%). The final sample comprised 100 midwives, which was an acceptable number for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to be conducted.[9–11]

Instrument

The CCAS[4] is a 37-item self-administered questionnaire which measures key psychosocial dimensions related to the culture and climate in organizations. The items are scored on a Likert scale ranging from 0 (poor or never) to 5 (excellent or always), and a total score is calculated. Higher scores reflect higher levels of organizational culture and climate or more positive attitudes to work climate, and conversely, a lower score indicates more negative attitudes toward culture and climate in the workplace. The 37-item scale includes the following core subscales: (a) Communication scale: 4 items, (b) decision support scale: 12 items, (c) level of conflict scale: 4 items, (d) teamwork scale: 15 items, and (e) general work satisfaction scale: 2 items.

Method

The translation and reconciliation process

The CCAS was translated by two independent translators, who were bilingual, and one item was added, to include in item 5 one more category for the medical staff of the units. A native English speaker with no knowledge of the original version of the scale back-translated the reconciliated Greek version. Additionally, an expert English speaker, who had an academic background with specific interest in clinical education, commented the back-translation. In order to determine whether the respondents had any problems with the language, then a cognitive debriefing process was conducted. For this purpose, we pilot tested the reconciliated Greek version of the CCAS on a convenience sample of 8 midwives with the following characteristics: age ≥18 years, Greek speaking, and willing to participate. Following their completion of the questionnaire they discussed it in a focus group. Although there is no general agreement on the most acceptable size for an effective focus group, the smaller groups appear to be easier to manage[12] and to promote interaction.[13] The Greek version of CCAS consisted of 38 items and it was completed in approximately 7 minutes by each midwife in the pilot test. The midwives in the pilot sample stated that most of the questions appeared to be relevant, distinct and clear. Following their suggestions, rephrasing of some questions (5, 6) took place. The data gathered from the focus group discussion were incorporated in the final form of the Greek version of CCAS.

Procedures

The 100 midwives in the study group completed the CCAS and standard demographic questions[14] during their shift at the hospital, in the presence of a researcher midwife. The participating midwives and student midwives were given support and the opportunity to discuss any concerns they might have related to the culture or climate in the organization, and were informed that these concerns would be shared with the manager midwife of the hospital. All the participants were informed verbally about the results of the study concerning the culture and climate of their organization.

Statistical analysis was conducted using the Statistical Package for Social Sciences (IBM SPSS Statistics), version 20.0 for Windows. Descriptive statistics (including means, standard deviations, frequencies and percentages) were derived for the sociodemographic variables. Differences between participants and non-participants were assessed by Chi-square tests for categorical variables. The assumptions of normality, homogeneity and independent cases of the sample were also checked. Items with open answers and qualitative data were not included in the analysis (7, 13, 17, 18, 20, 22, 24, 28). The questions (2, 4, 5, 6, 9, 19) were calculated independently for each answer. Finally, the number of the items were included in the analysis was 38.

Cronbach's alpha and Guttman split-half coefficients were calculated to assess reproducibility and consistency of the CCAS, with the acceptance of a minimum value of 0.70 for group comparisons.[15] EFA and CFA were conducted to check the structural validity of the scale. Grouped data[16] were analysed by the use of Varimax rotation and the Principal Components Method to determine the dimensionality of CCAS using the following criteria: (a) eigenvalue >1; (b) factor loading >0.350.

Ethical considerations

Before commencement of the study, the research ethics boards of both public hospitals approved the study protocol (NO#169/5.4.2013, NO#60ΣΥΝ/6ΗΔ/22.11.2013). A covering letter

which explained the aim and the significance of the study, and the confidential and anonymous character of the participation, accompanied the questionnaires. Each completed questionnaire was returned to the researchers in a sealed envelope.

RESULTS

The demographic and professional characteristics of the participating midwives are shown in table 1.

The Greek CCAS demonstrated an overall acceptable internal consistency. Cronbach's alpha coefficient was 0.878, coefficient interval (CI) 95%: 0.834–0.915, p<0.0001 for the total scale and the Guttman split-half was 0.757.

The EFA of the Greek version of the scale identified 7 orthogonal factors (KMO measure of sampling adequacy: 0.717 and Bartlett's test of sphericity: 1032.491, df=388, p<0.0005). The Screeplot (fig. 1) suggested that there are 7 factors in the model, which together explain 68.23% of the data (tab. 2).

The factors metrics were as following: (a) Teamwork (items: 6, 7, 21, 22, 27, 33, 35, 36) eigenvalue: 7.140, accounted for 28.36% of the variance; (b) leadership and administration (items: 5, 8, 23, 30, 34) eigenvalue: 2.528, accounted for 10.04% of the variance; (c) conflicts (items: 17, 18, 19, 20) eigenvalue: 2.163, accounted for 8.59% of the variance; (d) communication (items 1, 3, 4, 24) eigenvalue: 1.565, accounted for 6.22% of the variance; (e) stress and education (items: 28, 31, 32) eigenvalue: 1.412, accounted for 5.61% of the variance; (f) workload (items: 25, 26) eigenvalue: 1.236, accounted for 4.91% of the variance; (g) changes in the department (item: 29) eigenvalue: 1.133, accounted for 4.5% of the variance.

According to the Greek-CCAS validation study, 11 of the 38 items were excluded from the analysis, which were perceived as not important for Greek midwives (items: 2, 9, 10, 11, 12, 13, 14, 15, 16, 37, 38).

In the CFA, the 7 latent variables were strongly correlated according to the Maximum Likelihood method.

Table 1. Characteristics of the study sample of Greek midwives who completed the Greek version of the Culture/Climate Assessment Scale (CCAS) (n=100).

	All midwives no (%)	Student midwives no (%)	Employed midwives no (%)
Sex			
Male	4 (4%)		4 (4%)
Female	96 (96%)	13 (13%)	83 (83%)
Hospital			
Public	87 (87%)	13 (13%)	74 (74%)
Private	13 (13%)		13 (13%)
Marital status			
Single	40 (40%)	13 (13%)	27 (27%)
Married	52 (52%)		52 (52%)
Divorced	7 (7%)		7 (7%)
Widow	1 (1%)		1 (1%)
Education			
Student	13 (13%)	13 (13%)	
TEI	68 (68%)		68 (68%)
Postgraduate	19 (19%)		19 (19%)
Doctoral degree	0%		

TEI: Technological Educational Institute

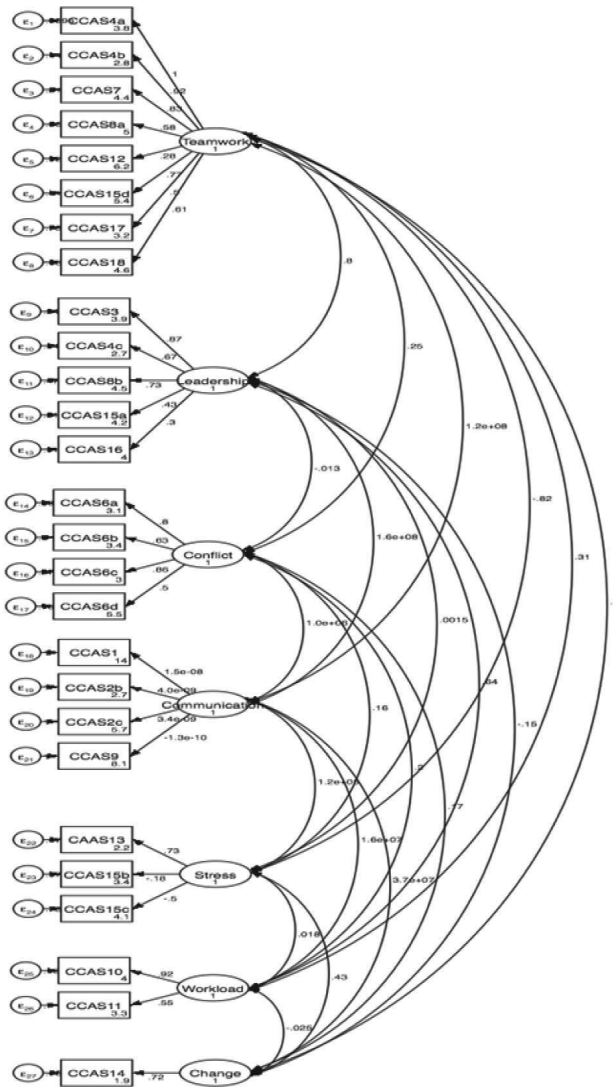

Figure 1. Scree plot for evaluation of the Greek version of the Culture/Climate Assessment Scale (CCAS).

Table 2. Exploratory factors and explained variance after rotation for the Greek version of the Culture/Climate Assessment Scale (CCAS).

Factors				Rotation sums of squared loadings				Extraction sums of squared loadings		
		Rescaled loadings	Eigen values	% of variance	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
Factor 1 *(teamwork)*	6	0.669		7.140	28.362	28.362			28.362	
	7	0.794		2.528	10.042	38.404				
	21	0.524		2.163	8.593	46.997		7.140		28.362
	22	0.463	7.140	1.565	6.218	53.215	0.862			
	27	0.514		1.412	5.611	58.825				
	33	0.433		1.236	4.910	63.735				
	35	0.870		1.133	4.499	68.234				
	36	0.416								
Factor 2 *(leadership and supervision)*	5	0.418						2.528	10.042	
	8	0.826								38.404
	23	0.666	2.528	10.042	38.404	0.771	0.777			
	30	0.643								
	34	0.596								
Factor 3 *(the level of conflict)*	17	0.552						2.163	8.593	
	18	0.684	2.163			0.804	0.807			46.997
	19	0.713		8.593	46.997					
	20	0.473								
Factor 4 *(communication)*	1	0.412						1.565	6.218	
	3	1.083	1.565			0.674	0.627			53.215
	4	0.619		6.218	53.215					
	24	0.190								
Factor 5 *(stress and education)*	28	0.444						1.412	5.611	
	31	0.807	1.412	5.611		0.526	0.596			58.825
	32	0.761			58.825					
Factor 6 *(work load)*	25	0.484						1.236	4.910	
	26	0.946	1.236	4.910	63.735	0.705	0.716			63.735
Factor 7 *(change policy)*	29	0.893	1.133	4.499	68.234			1.133	4.499	68.234

Estimates, standard error, t-values, error terms and r^2 for all the questions, which comprised each latent variable, and the estimated Goodness of Fit Statistics are shown in figure 2.

The Cronbach's alpha coefficients for the subscales of the Greek version of CCAS were as follows: (a) Teamwork (6, 7, 21, 22, 27, 33, 35, 36): 0.853, (b) leadership and administration (5, 8, 23, 30, 34): 0.771, (c) conflicts (17, 18, 19, 20): 0.804, (d) communication (1, 3, 4, 24): 0.674, (e) stress and education (28, 31, 32): 0.526, (f) work load (25, 26): 0.716 and (g) changes in the department (29): 0,786.

DISCUSSION

The CCAS is a scale for identifying the climate and culture of an organization. It has already been validated in other countries, such as Canada,[2] and has shown remarkable psychometric properties. The Greek translation of the CCAS was first used to identify problems in the Midwifery Department of the Technological Educational Institute (TEI) of Athens. According to an earlier study, all the scales of the CCAS showed adequate levels of reliability, with the exception of the scale "Level of Conflict".[2]

Cronbach's standardized alpha coefficient and Guttman Split-half for the Greek translated and culturally compatible CCAS were almost the same as those reported in the first validation study (0.88), and in the Canadian validation study it was (0.70). Our findings confirm a 7-factor structure for the scale and it was observed that the subscales of the Greek CCAS showed acceptable reliability. The significant differences in item-factor loadings may be explained by

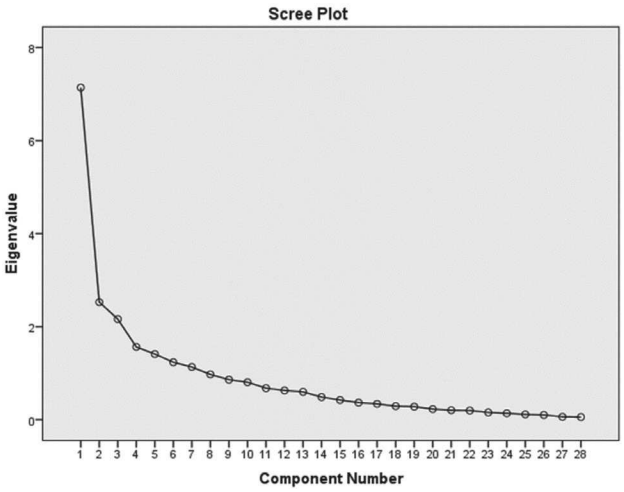

Figure 2. Confirmatory factor analysis for the Greek version of the Culture/Climate Assessment Scale (CCAS).

the varied cultural backgrounds. All the goodness of fit statistics found to be very good.

The results of this study showed that the major factors forming the organizational culture and climate, and therefore affecting the working conditions of the midwifery staff are: (a) Teamwork, (b) leadership-supervision, (c) conflicts, (d) communication, (e) stress and education, (f) the workload, and (g) changes in the department. In the study of Clark and colleagues[4] the corresponding factors were: (a) Communication, (b) support of decision making, (c) conflicts, (d) teamwork, and (e) job satisfaction. There were similarities between the surveys on three factors: Communication, teamwork and conflict. It appears that many more factors influence the organizational culture and climate of the population of this study (midwifery staff) than the population of the earlier study (nursing staff), which identified 5 factors. Comparing the Cronbach's alpha coefficients of the two surveys we observed that the internal consistency of this study was slightly greater than that of Clark and colleagues. Other studies have also concluded that organizational culture and climate are correlated with factors similar to those indicated in our study, such as "teamwork",[17] "job satisfaction",[18,19] "communication or interpersonal relations",[17,19,20] "supervision-leadership",[17,19,21] "workload",[22] and "recognition".[19,23,24]

According to this Greek-CCAS validation study, 11 of 38 items were excluded from the analysis, which were perceived as not important for Greek midwives. These items concerned the effectiveness of e-mail communication; by whom they are supported when they make decisions; the understanding by the core leadership of department, and finally, whether to recommend their unit to other midwives as a place to work.

We confirm that this validated Greek version of CCAS may be used for identifying problems in the working environment of Greek midwives. The findings of the instrument demonstrate the necessity for effective communication and collaboration in the workplace of midwives, and confirm the existence of an organizational culture and organizational climate, which should facilitate the development of each department, in order to provide optimal care for the women attending the hospital.

ΠΕΡΙΛΗΨΗ

Ψυχομετρικές ιδιότητες της ελληνικής κλίμακας κουλτούρας και κλίματος για την αξιολόγηση των συνθηκών εργασίας των μαιών

Β. ΒΙΒΙΛΑΚΗ,[1] Χ. ΑΘΑΝΑΣΙΑΔΟΥ,[1] Ε. ΖΕΜΠΕΡΛΙΓΚΟΥ,[1] Μ. ΣΤΑΜΑΤΟΠΟΥΛΟΥ,[2] P. SPRINGER,[3] Π. ΠΡΕΖΕΡΑΚΟΣ[2]

[1]Τμήμα Μαιευτικής, Τεχνολογικό Εκπαιδευτικό Ίδρυμα Αθήνας, Αθήνα, [2]Εργαστήριο Ολοκληρωμένης Φροντίδας Υγείας, Τμήμα Νοσηλευτικής, Πανεπιστήμιο Πελοποννήσου, Σπάρτη, [3]St Luke's Health System, Kansas City, MO, ΗΠΑ

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ΣΚΟΠΟΣ Η διερεύνηση των ψυχομετρικών ιδιοτήτων της κλίμακας Culture/Climate Assessment (CCAS), που αναπτύχθηκε για την αξιολόγηση της επικοινωνίας, της υποστήριξης των αποφάσεων, του επιπέδου σύγκρουσης, της ομαδικής εργασίας, της γενικής ικανοποίησης από την εργασία, καθώς και του προσωπικού επιπέδου άγχους, αντιληπτού επιπέδου αλλαγών και γενικού επιπέδου ηθικής εντός του οργανισμού. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Η παρούσα συγχρονική μελέτη εκπονήθηκε στα δύο μεγάλα μαιευτικά νοσοκομεία της Αθήνας. Μετά τη διπλή αντίστροφη μετάφραση του ερωτηματολογίου διεξήχθη πιλοτική μελέτη σε ένα μικρό τυχαίο δείγμα μαιών. Κατά τη διάρκεια συλλογής των δεδομένων (Μάιος 2013 έως και Φεβρουάριο 2014) προσκλήθηκαν να συμμετάσχουν στη μελέτη όλες οι μαίες οι οποίες πληρούσαν τα κριτήρια για συμμετοχή σε αυτή. Από τις 123 μαίες, που πληρούσαν τα τεθέντα κριτήρια, 23 αρνήθηκαν να συμμετάσχουν (βαθμός ανταπόκρισης: 81,3%). Οι συντελεστές Cronbach's alpha και Guttman split-half

υπολογίστηκαν για την εκτίμηση της εσωτερικής συνοχής της κλίμακας. Διεξήχθη διερευνητική και επιβεβαιωτική παραγοντική ανάλυση προκειμένου να ελεγχθεί η δομική εγκυρότητα της κλίμακας. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Η διερευνητική παραγοντική ανάλυση ανέδειξε τον πολυδιάστατο χαρακτήρα της κλίμακας και αποκάλυψε επτά ορθογώνιους παράγοντες. Το μοντέλο των επτά παραγόντων πρόσφερε πολύ καλή προσαρμογή στα δεδομένα μας, όπως αξιολογήθηκε από την επιβεβαιωτική παραγοντική ανάλυση. Οι τιμές των συντελεστών Cronbach's alpha και Guttmann ήταν 0,878 και 0,757, αντίστοιχα. **ΣΥΜΠΕΡΑΣΜΑΤΑ** Η ελληνική μετάφραση της κλίμακας έχει αποδεκτή αξιοπιστία και εγκυρότητα για την αξιολόγηση της οργανωσιακής κουλτούρας και του κλίματος στο εργασιακό περιβάλλον του μαιευτικού προσωπικού. Η κλίμακα επιτρέπει την περαιτέρω διερεύνηση των παραγόντων που καθορίζουν τις συνθήκες εργασίας και επηρεάζουν την ικανοποίηση από την εργασία των μαιών.

Λέξεις ευρετηρίου: Αξιοπιστία, Εγκυρότητα, Κλίμακα αξιολόγησης κουλτούρας/κλίματος, Μαίες

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Corresponding author:

P. Prezerakos, Laboratory of Integrated Health Care, Department of Nursing, University of Peloponnese, E & S Valioti and Plateon street, 231 00 Sparta, Greece
e-mail: panprez@uop.gr; prezerpot@gmail.com