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A contribution to the validation of the Italian version of the work-related quality of life scale

Giacomo Garzaro[1], Marco Clari[1], Francesca Donato[1], Valerio Dimonte[1], Nicola Mucci[2], Simon Easton[3], Darren Van Laar[3], Paola Gatti[4], Enrico Pira[1]

[1] Department of Public Health and Pediatrics - University of Torino
[2] Department of Experimental and Clinical Medicine - University of Firenze
[3] Department of Psychology - University of Portsmouth
[4] Department of Psychology - University of Torino

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Summary

Background: *Quality of working life has been shown to play a key role in reducing strain inside and outside the workplace, supporting the fulfillment of workers' wellbeing and increasing workforce productivity. Van Laar et al. in 2007 developed the Work-Related Quality of Life (WRQoL) scale that was applied to several different work environments and translated into nine languages.* **Objectives:** *We aimed to test and validate an Italian version of the WRQoL scale.* **Methods:** *A cross-sectional design was conducted to collect a sample of healthcare professionals (N=430) in 8 hospitals in the Northwest of Italy. Internal consistency of each scale was tested through Cronbach's alpha. A Confirmatory factor analysis was performed. Independent samples t-tests and ANOVA were performed to determine whether the scores on the subscales differed according to various socio-demographic variables.* **Results:** *A seven factors structure was confirmed (Control at work; General well-being; Home-work interface; Stress at Work; Job and career satisfaction; Working conditions; Employee Engagement; χ^2=682.453, p<.001; χ^2 and df(251) ratio=2.71; CFI=.90; RMSEA=.06; SRMR=.06). All subdimensions showed Cronbach's alphas ≥ 0.70 but for Stress at Work (alpha 0.65). The subscales differentiated between groups of people according to several socio-demographic characteristics (i.e., profession, age, length of employment).* **Discussion:** *The Italian version of WRQoL is a brief and sufficiently reliable tool that can contribute to a more complex and complete evaluation of the psychological well-being at work due to its multidimensionality. Overall, the use of this tool in occupational health practice, in addition to that of other instruments already available, should prove useful in monitoring workers' well-being before and after interventions.*

Riassunto

***«Un contributo alla validazione della versione italiana della scala WRQoL per la valutazione della qualità di vita lavorativa»*.** **Introduzione:** *La qualità della vita lavorativa ha un ruolo fondamentale nel ridurre le tensioni all'interno e all'esterno dell'ambito lavorativo, supportando la soddisfazione dei lavoratori e aumentando la loro produttività. Nel 2007, Van Laar et al. hanno sviluppato una scala per misurare la qualità di vita lavorativa (WRQoL) che è già stata applicata a diversi lavori e tradotta in nove lingue, in Italia uno strumento con queste caratteristiche non risulta ad oggi disponibile.* **Obiettivi:** *Testare e validare una versione italiana della scala WRQoL.*

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Corresponding author: Paola Gatti, Postdoctoral Research Fellow, Department of Psychology, University of Torino, Via Verdi 10, 10124 Torino, Italy - Tel. +39-011-6702055 - E-mail: p.gatti@unito.it

Metodi: *È stato condotto uno studio trasversale per reclutare professionisti sanitari (N=430) in 8 ospedali dell'Italia Nord-Occidentale. La consistenza interna per ogni sottoscala è stata valutata attraverso l'alfa di Cronbach. È stata effettuata un'analisi fattoriale confermativa. Sono stati condotti t-tests e ANOVA per determinare se i punteggi delle sottoscale differivano in relazione ad alcune variabili socio-demografiche.* **Risultati:** *Una struttura a sette fattori è stata confermata dalle analisi (Controllo al lavoro; Benessere generale; Adattamento casa-lavoro; Stress al lavoro; Soddisfazione lavorativa e di carriera; Condizioni lavorative; Coinvolgimento del lavoratore; χ^2=682.453, p<.001; χ^2 and df(251) ratio=2.71; CFI=.90; RMSEA=.06; SRMR=.06). Tutte le sottoscale hanno ottenuto un'alfa di Cronbach ≥0.70 tranne lo Stress al lavoro (alfa 0.65). Si rilevano differenze statisticamente significative nei punteggi registrati sulle sottoscale in gruppi di rispondenti identificati in base ad alcune caratteristiche socio-demografiche (i.e., la professione, l'età, l'anzianità lavorativa).* **Discussione:** *La versione italiana della scala WRQoL è uno strumento veloce e sufficientemente affidabile che può contribuire ad una valutazione complessa e multidimensionale del benessere lavorativo. Il suo uso nella pratica della medicina del lavoro potrà rivelarsi utile per monitorare il benessere dei lavoratori e il suo miglioramento in aggiunta agli strumenti già utilizzati.*

Introduction

Work takes up most of people's daytime, heavily influencing their schedules, requiring a large amount of mental and time resources even in non-working hours.

For many, work is not only a way to make a living (i.e., buying consumer products), but it is also essential to gain and maintain a positive social identity, an aspect that has made the relationship between the Quality of Work Life (QoWL) and quality of non-work life even more intertwined (52). Thus, it is apparent that QoWL cannot any longer be solely defined as job satisfaction, as it encompasses other important determinants belonging to the personal sphere, such as family, leisure and social activities (34). In this regard, a high QoWL has been shown to play a key role in reducing strain inside and outside the workplace, as well as in fulfilling workers' needs. Conversely, pressure at work negatively affects QoWL, with detrimental consequences on workers' physical and psychological health (46). Given that a high QoWL tends to correlate with increased workforce productivity (21), job satisfaction and health status (44), occupational health service organizations are now considering QoWL as one of the key determinants upon which to act in order to foster workplace well-being.

Despite the relevance of QoWL in all aspects of a worker's life, there is still a lack of consensus about its definition. Generally, QoWL is regarded as a multidimensional concept relating to a meaningful and satisfying job (45). It is usually defined as comprising different components such as work environment, organizational culture and climate and management, as well as all aspects of employees' communication, opportunity development and compensation. Additional key components include job satisfaction and security, work autonomy and adequate facilities and resources (36). Lastly, antecedent factors to job performance, such as the perceived leadership style, have been shown to contribute to QoWL definition (24).

Despite the presence of instruments widely used to assess general quality of life, such as the Short Form Survey (SF-36, SF-12 general), which takes into account the working life as a sub-dimension [e.g., World Health Organization Quality of Life-100 (WHOQOL-100)], or measures of quality of life in specific conditions, such as the RAND Medical Outcomes Study, which assesses quality of life in chronic conditions, it is very difficult to find measures mainly focusing on QoWL. All QoWL measurement tools developed so far have proven inadequate to assess the multidimensional factor structure of QoWL due to lack of psychometric properties and consistent factor structures (3, 36, 47, 51). Moreover, these instruments often require lengthy procedures that cannot easily be implemented in everyday clinical practice, *de facto* limiting their use

by occupational health services. An instrument such as the National Institute for Occupational Safety and Health (NIOSH) quality of work-life questionnaire is made up of 79 items, which makes it long and difficult to fill out (41). Nevertheless, measuring QoWL is highly recommended among human resource management (HRM) best practices (31).

To overcome the aforementioned issues, a multidimensional measure of quality of working, termed Work-Related Quality of Life (WRQoL) scale, was first developed by Van Laar et al. (49). It consisted of a questionnaire first tested in the health care setting and later on applied to several different work environments and translated into nine languages (14-16, 19, 20).

In its original form, the WRQoL includes the following six dimensions: 1) *Control at work (CaW)*. This factor assesses the perception of personal control, or in other words the extent to which workers feel they are involved in the decision-making or can voice their opinion in the workplace; 2) *General well-being (GWB)*. This factor measures the physical and psychological well-being of workers, which may be independent of employment status, and it may influence or be influenced by the job; 3) *Home-work interface (HWI)*. This factor defines the interplay between work and home, including the presence of adequate support such as flexibility at work and the presence of adequate facilities for employees; 4) *Job and career satisfaction (JCS)*. This factor pertains to the extent of workers' contentment with their job and career development. 5) *Stress at work (SaW)*. This factor reflects how employees feel excessive pressure or stress at work; and 6) *Working conditions (WCs)*, which measures work hygiene and physical working conditions (49).

In 2011, a revised version of the scale – the one we wanted to validate here initially – was developed including a seventh dimension, termed *Employee Engagement (EEn)*, which evaluates the extent to which employees are committed to the organization and its values (18).

Overall, the WRQoL scale provides a multidimensional tool to measure QoWL by means of tested and validated psychometric properties. The availability of sound instruments to evaluate QoWL, such as the aforementioned, is therefore vital to occupational physicians and organizations willing to foster workers' well-being. To our knowledge, no such instrument was yet available in the Italian language. Thus, here we have prepared, tested and validated an Italian version of the WRQoL scale to be used in occupational medicine.

Methods

Participants

A cross-sectional design was conducted to recruit a consecutive sample between May and July 2018. Study participants included nurses or physicians working at the time of the data collection in 8 hospitals in the Northwest of Italy. Full and part-time workers were included. Nurse assistants and other allied healthcare professionals as well as non-native Italian speakers were excluded. Free-lancers and agency staff were not considered as well. The sample consisted of 430 respondents: 82.6% of respondents were nurses, while 17.4% were physicians. The sample was made up of 74.2% females and 25.8% males. Average age was 44.5 years (*SD*=9.45), while average length of employment was 17.4 years (*SD*=10.98). As for areas of clinical practice: 56.2% of respondents worked in surgery, 25.8% in medicine, 7.3% in intensive care, 2.6% in the gynecological area, 1.9% in rehabilitation and 6.2% in other areas.

Procedures

The WRQoL scale was translated into Italian by two experts working independently. The two native Italian translators had a different background: one was an occupational physician and the other one a nurse. A literal translation was performed to preserve the original concepts using an informal vocabulary. An occupational psychologist was then put in charge of double-checking the meaning and consistency of word choices. Subsequently, they compared their translations to reach a consensus. An English native speaker translator did a backward translation. This version was administered to a small sample of nurses (n=5) and physicians (n=3) who worked in hospitals other than those involved in the final questionnaire administration, and a few minor changes were made to make the items clearer.

The Italian version of the scale – see Appendix 1 for the original version of the WRQoL, reproduced with the permission of the authors, and its Italian translated version – was included in a self-report questionnaire, which was administered in paper-and-pencil format. Along with the questionnaire, people who satisfied inclusion/exclusion criteria received a document describing the study aims, specifying that their participation would be on a voluntary basis, and declaring that their personal data would be kept strictly confidential. All study participants provided their written consent. Approval from the Health Directorate Boards of the involved hospitals was obtained before the beginning of the study.

Measures

The second edition of the WRQoL (WRQoL_2) is made up of 28 items (27 items + 1 item on overall QoWL) divided in 7 subscales to be rated on a Likert-type scale, from 1 (*Strongly disagree*) to 5 (*Strongly agree*). We administered all the 32 items that the authors used to validate the second version of the scale, where they kept 4 items taken from the first version for the sake of comparability.

In addition to the WRQoL scale, this study takes several socio-demographic variables into consideration, namely gender, age, profession, length of employment and area of clinical practice. These variables were either used as controls or employed in additional analyses to make the study more complete. Previous QoWL studies addressing the constructs of job satisfaction and emotional exhaustion defined the aforementioned dimensions as potential antecedents of work well-being – see Magee for gender and job satisfaction (35); Bekker et al. for gender and emotional exhaustion (5); Claes and Van De Ven for age and job satisfaction (9); Kirkcaldy and Siefen for length of employment and job satisfaction (32); Bianchi et al. for both age and length of employment and burnout (6); Uchmanowicz et al. for profession and quality of life and burnout (48). We thus expected significant differences in at least some of these socio-demographic variables for the WRQoL subscales.

Our study takes also the DASH questionnaire into consideration (29, 43). It comprises 30 items to measure the degree of problems in performing activities related to upper extremities and evaluates activity-related symptoms and the impact of the disabilities on the psychosocial domain. Each item is rated on a Likert scale from 1 (no difficulty or no symptom) to 5 (unable to perform activity or severe symptoms). The final score provides a standardized upper extremity specific outcome, ranging from 0 (no disability) to 100 (severe disability). In this sample, the Cronbach's α was 0.97.

Data Analyses

As a preliminary assessment of the scale properties, descriptive analyses (*M*, *SD*, asymmetry and kurtosis) of individual items were conducted on the entire sample (N=430). Internal consistency of each scale was tested through Cronbach's alpha. The cut-off value of an acceptable (good) alpha was .70 (29).

Confirmatory factor analysis (CFA) (Maximum Likelihood Method, ML) was performed on the entire sample using MPlus 8 (40). Since the WRQoL_2 scale consists of more than 4 subscales, it would have been preferable to test a second-order CFA (23), where WRQoL would have been considered as a higher-level latent variable explaining the shared variance of the different subscales. However, in order to be more consistent with the original work and also because the subscales were not all in the same position in the nomological network making up the macro-construct of the quality of life, we decided not to follow that route. The goodness of fit of the model was evaluated according to the recommendations by Hair et al. (26), using at least one absolute fit index and one incremental fit index. By means of the former, we expected to obtain the following: i) root mean square error of approximation (RMSEA); ii) standardized root mean residual (SRMR), and iii) normed chi-square. With the latter, we sought to determine the comparative fit index (CFI). According to Hair et al. (26), we also identified cut-off values for the goodness-of-fit indices by taking into account the sample size and the number of observed variables. Given that we had more than 250 respondents and a number of items in the scale ranging from 12 to 30, we expected to obtain the following values: i) RMSEA <.07; ii) SRMR <.08; and iii) CFI >.92. As for the normed chi-square –

i.e., the chi-square value divided by the degrees of freedom –, a value <2.0 was deemed excellent, while a value between 2.0 and 5.0 was deemed acceptable. Lastly, for construct validity, the individual standardized factor loadings was ≥.50 (26).

Successively, another validation step was performed by independent sample *t*-tests and ANOVA, which allowed us to test the hypothesis that scores on the subscales differed according to various sociodemographic variables (i.e., gender, age, length of employment and profession).

Lastly, in order to test for discriminant validity, we assessed whether musculoskeletal disorders had a moderate correlation with the WRQoL subscales in a subsample of nurses – taken from our total sample – working in the operating room (n=214). These professionals are particularly exposed to this kind of pain because of the characteristics of their job (10). As previously acknowledged by Waddel and Burton (2001), this pain in the upper limbs is correlated with people's general quality of life (50). Specifically, upper-limb musculoskeletal issues were evaluated by the Italian version of the disabilities of the arm, shoulder and hand (DASH) questionnaire (43). Pearson's product-moment was used to evaluate any correlation. Correlations of .10–.29 were considered small, .30–.49 moderate, and .50 strong (11).

Results

Descriptive Statistics for Individual Items

Descriptive analysis (table 1) revealed highest mean scores for two items that had not been used in the final version of the scale. These were followed by three items having high mean scores and fitting into the GWB subscale (i.e., in decreasing order, items 10, 17 and 4). The first item deriving from another subscale with a high mean value was item 19, tapping the SaW dimension. The items with the lowest mean scores were, in decreasing order, 26, 30 and 18, each tapping a different dimension (i.e., EEn, CaW and JCS, respectively). In addition, when we only took into account the 25 items used in the final version of the scale – this item reduction is explained in the section below –, we found that 21 out of 25 items had a low negative asymmetry – i.e., the distribution

Table 1 - Descriptive statistics for individual item. The items included in the final solution with related dimensions are indicated in grey

Item	Mean	SD	Asymmetry	Kurtosis
i1	3.95	.887	-.916	1.176
i2 (CaW)	3.35	1.017	-.388	-.236
i3	3.70	.917	-.645	.501
i4 (GWB)	3.38	1.041	-.308	-.471
i5 (HWI)	3.19	1.069	-.261	-.435
i6 (HWI)	3.07	1.023	-.018	-.664
i7 (SaW)	3.35	1.071	-.109	-.692
i8 (JCS)	3.16	1.099	-.286	-.521
i9	2.81	1.204	.086	-.933
i10 (GWB)	3.65	.959	-.549	.210
i11 (JCS)	3.18	1.079	-.145	-.524
i12 (CaW)	3.11	1.082	-.314	-.566
i13 (WCs)	3.00	1.025	-.113	-.492
i14	3.00	1.022	-.248	-.396
i15 (GWB)	3.20	.938	-.290	-.048
i16 (WCs)	3.28	1.087	-.426	-.442
i17 (GWB)	3.46	.763	-.351	.742
i18 (JCS)	2.62	1.085	.194	-.551
i19 (SaW)	3.37	1.074	-.280	-.465
i20 (JCS)	2.83	.981	-.051	-.533
i21 (GWB)	3.33	.901	-.408	.200
i22 (WCs)	2.97	.955	-.144	-.410
i23 (CaW)	2.93	1.030	-.139	-.456
i24	2.63	.867	.171	-.010
i25 (HWI)	3.29	.957	-.484	.018
i26 (Een)	2.30	.925	.371	-.199
i27 (Een)	3.06	.954	-.175	-.060
i28 (Een)	2.99	.903	-.174	.191
i29	3.23	.968	.067	-.386
i30 (CaW)	2.32	1.003	.352	-.476
i31 (WCs)	2.81	1.043	.012	-.569
i32	3.14	.925	-.450	-.006

SD=Standard deviation; CaW=Control at work; GWB=General well-being; HWI=Home-work interface; JCS=Job and career satisfaction; WCs=Working conditions; Een=Employee Engagement

tail was longer on the left hand side of the mean than that on its right hand side –, whereas 4 items (i.e., 18, 26, 30 and 31) had a low positive asymmetry – i.e., the distribution tail was longer on the right hand side of the mean than that on its left hand side. Twenty out of 25 items had a low negative kurtosis index – i.e., the distribution was flat with wide tails – while 5 items displayed a low positive kurtosis index (i.e., 10, 17, 21, 25 and 28). Nevertheless, all values of asymmetry and kurtosis ranged far below the cut-off values of –1.0 and +1.0, except for item 1, which was not used in this solution. Thus, the degree of distortion from normal distribution in our results appears to be minimal (4, 40).

Reliability

When we used the items in the second edition of the WRQoL (WRQoL_2), we obtained the following alpha values: .59 for CaW, .83 for GWB, .77 for HWI, .68 for JCS, .62 for SaW, .78 for WCs, and .79 for EEn. Three subscales did not exceed the cut-off value of .70 for Cronbach's alpha (42). As the alpha value for CaW was far below the cut-off value, we added to the subscale item 23, used in the first version of the instrument. By using four items (i.e., 2, 12, 23 and 30), we improved reliability (alpha=.70). In addition, the deletion of item 1 from the JCS subscale resulted in an alpha value of .70, while the deletion of items 24 and 29 from the Saw resulted in an alpha of .65. The measure of SaW could not reach a completely satisfactory reliability.

Since increasing the number of items in a scale generally increases the value of Cronbach's alpha due to the way it is calculated (12), the observation that the deletion of items led instead to an increase in the alpha value seemed particularly relevant. When item 1 was deleted and item 23 added, the reliability of six of the seven subscales resulted satisfactory (from .70 to .83). Considering this final solution, corrected item-total correlations were between .40 and .60 for CaW, .56-.68 for GWB, .53-.66 for HWI, .47-.50 for JCS, .58-.61 for WCs, and .49-.72 for EEn. The only scale that did not overcome the threshold was SaW, but the value of .65 for a two-item measure can be considered acceptable. The corrected item-total correlation for SaW was equal to .49.

Confirmatory Factor Analysis

We next tested the solution proposed by the authors of the original scale for the WRQoL_2. For this analysis, because of Cronbach's alphas, we chose to eliminate item 1 from JCS and items 24 and 29 from SaW, and to add item 23 to CaW.

We first estimated a model with these 25 selected items – all used in the second revised edition of the WRQoL except for item 23. The model identified seven subdimensions. Fit indices for this solution were not completely satisfactory, especially the CFI [χ^2=789.262, p<.001; χ^2 and df(254) ratio/normed χ^2=3.10; CFI=.87; RMSEA=.07; SRMR=.06].

Considering modification indices and semantic and lexical reasons stemming from item formulation, we estimated the error correlations between the following item pairs: 11 and 12 (from JCS and CaW, respectively); 18 and 30 (from JCS and CaW, respectively); 27 and 28 (both from EEn). The first two items are conceptually connected by the idea that the individual career path can be affected by external factors; the second two are conceptually connected by the idea that satisfaction and control are also a question of opportunity; and the last two are adjacent to each other on the scale and conceptually connected by the idea that respondents can have a favorable opinion of the organization where they work.

Fit indices for the final 25-item solution were fairly satisfactory: χ^2=682.453, p<.001; χ^2 and df(251) ratio=2.71; CFI=.90; RMSEA=.06; SRMR=.06. The CFI value was still under the cut-off value of .92, which is the ideal value considering the sample size and the number of observed variables in the model (17). The final loadings ranged from .47 to .79 on the seven subscales (figure 1). Only one item was under the cut-off value of .50. For the sake of clarity and tidiness, the correlations between the subscales of the WRQoL are not shown in figure 1 but instead reported in table 2. The correlations are in line with the expectations except for two cases: the too high correlation between CaW and JCS (.91) and the too low correlation between GWB and SaW (.09).

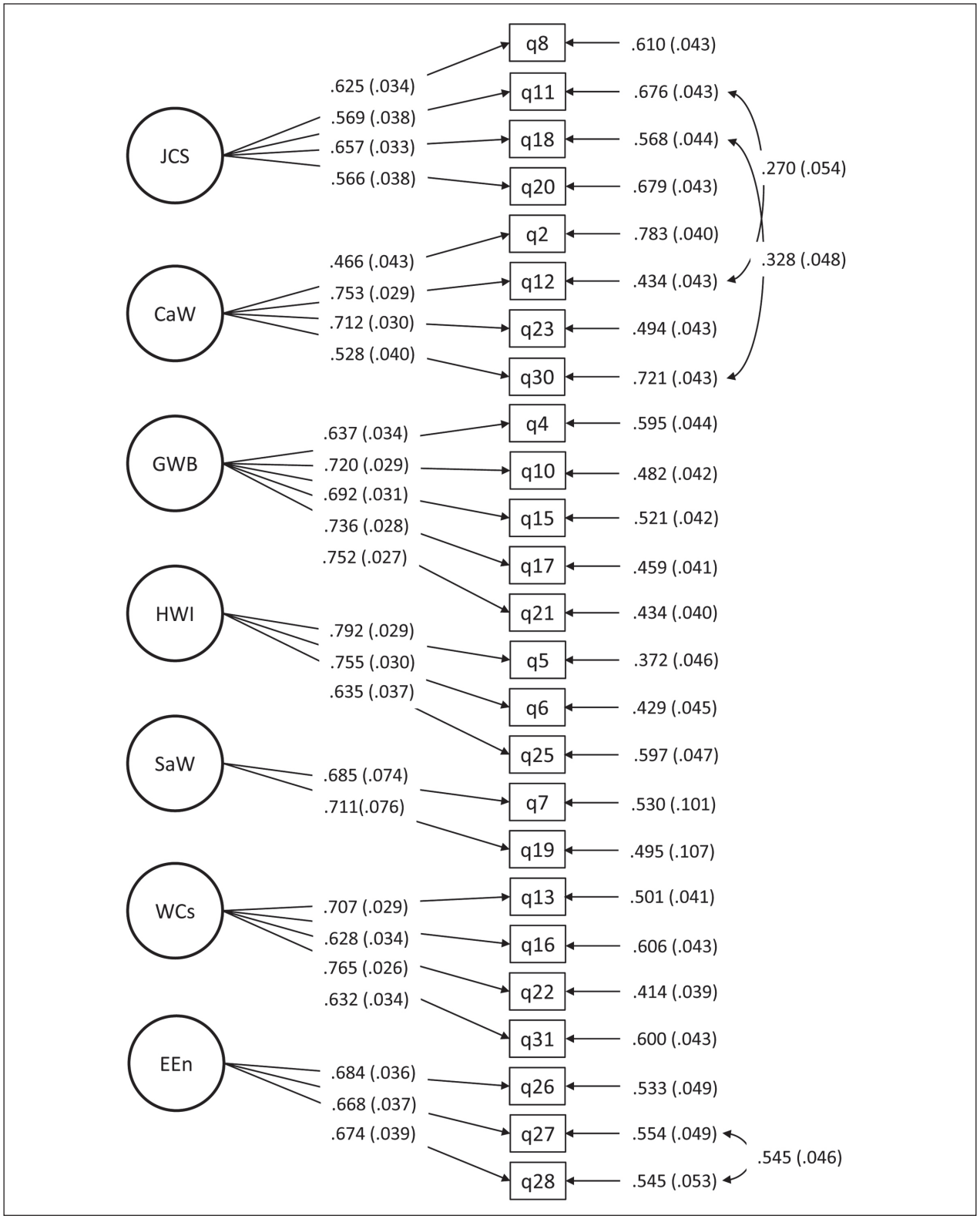

Figure 1 - Confirmatory factor analysis: standardized solution. (For the sake of clarity, the correlations between the subscales are not shown here but in table 2).

Table 2 - Correlations between the WRQoL subscales as yielded by the CFA

WRQoL	1	2	3	4	5	6	7
CaW	-						
GWB	.55	-					
HWI	.60	.52	-				
JCS	.91	.61	.66	-			
SaW	-.18	-.09	-.30	-.17	-		
WCs	.84	.57	.66	.88	-.32	-	
EEn	.86	.49	.67	.86	-.31	.87	-

Analysis of Variance

Independent samples *t*-tests and ANOVA were performed to determine whether scores on the seven subscales of the 25-item model differed based on several socio-demographic variables (i.e., gender, age, length of employment and profession). Age and length of employment were recorded in three categories – these categories were chosen according to two criteria: numerical homogeneity and class meaningfulness.

As shown in table 3, all the subscales except for GWB and SaW displayed significant differences when the respondents' profession was taken into account. Mean values were higher for physicians in all cases, with the highest *t*-value on the CaW dimension [$t(420)=4.23$, $p<.001$], where physicians and nurses had an average value of 13.05 and 11.45, respectively.

Quite surprisingly, there were no significant differences on the subscales due to gender. In this regard, it is important to mention that the sample was unbalanced for gender – 25.8% of subjects were males and 74.2% females. In addition, we should point out that we found a significant relationship not only between the variables "profession", which showed significant differences on almost all the subscales, and "gender" [χ^2 (1, N=430)=32.53, $p<.001$], but also between the variables "profession" and "age" [χ^2 (2, N=428)=24.82, $p<.001$] or "length of employment" [χ^2 (2, N=419)=11.36, $p<.005$]. The sample was more balanced between physicians and nurses for males (35% and 65%, respectively) than for females, where it was unbalanced in favor of nurses (89%). In this regard, both the general unbalance and the relationship between gender and profession may have influenced our t-test results performed on the former variable.

Analysis of variance (post-hoc LSD) for the variables "age" and "length of employment", both recoded in three categories, presented some differences. Regarding "age", significant differences were found on CaW [$F(2, 417)=3.58$, $p<.05$] and EEn [$F(2, 348)=3.35$, $p<.05$]. The oldest respondents, aged from 51 to 69 years old, were the highest on both subdimensions, with significant differences with respect to two younger groups of respondents, aged from 24 to 40 and from 41 to 50. With regard to the "length of employment", significant differences were found on 4 out of 7 subscales, whereas GWB, SaW and EEn did not show any significant differences. People with the longest tenure – from 23 to 41 years in the profession – were higher on CaW [$F(2, 408)=7.64$, $p=.001$] and HWI [$F(2, 409)=4.31$, $p<.05$] than people with a length of employment ranging from 11 to 22 years. On the former sub-dimension, respondents with length of employment from 23 to 41 years also differed significantly from respondents with 0-10 years of tenure. Lastly, on JCS [$F(2, 406)=5.90$, $p<.005$] and WCs [$F(2, 408)=4.17$, $p<.05$], respondents whose length of employment was between 11 and 22 years had the lowest mean values, which differed significantly from the mean values of all other respondents. People with the longest tenure had the highest mean values on all the subscales.

Correlations

As expected, all the WRQoL subscales were significantly correlated with the DASH score, except for CaW (r=-.13, $p=0.059$). A moderate correlation was found between GWB (r=-.33, $p<.001$), SaW (r=.32, $p<.001$), and WCs (r=-.30, $p<.001$). HWI, JCS and EEn showed a small correlation with upper-limb musculoskeletal disorders (r=-.27, $p<.001$; r=-.17, $p=.007$; r=-.15, $p=.024$, respectively). The observation that the correlations are stronger between the more general subscales of the WRQoL scale (i.e., GWB and SaW) or the subscale more closely linked to the physical characteristics of the job (i.e., WCs) and the DASH score is consistent with previous findings (50). In addition, the fact that these

Table 3 - Results of *t*-test and analysis of variance on the six subscales of the WRQoL

WRQoL	Socio-demographic variables	Groups	N	Mean	SD	t or F values	Post hoc (LSD)
CaW	Profession	1. Nurses	347	11.45	2.87	*t*(420)=4.30, p<.001	---
		2. Physicians	75	13.05	3.21		
	Age	1. 24-40 years	127	11.44	2.84	*F*(2, 417)=3.58, p<.05	3 > 1 e 2
		2. 41-50 years	184	11.58	2.99		
		3. 51-69 years	109	12.39	3.07		
	Length of Employment	1. 0-10 years	137	11.61	2.77	*F*(2, 408)=7.64, p<.01	3 > 1 e 2
		2. 11-22 years	135	11.07	3.17		
		3. 23-41 years	139	12.45	2.95		
GWB	---	---		---	---	---	---
HWI	Profession	1. Nurses	350	9.40	2.48	*t*(421)=2.77, p<.01	---
		2. Physicians	73	10.29	2.54		
	Length of Employment	1. 0-10 years	137	9.50	2.60	*F*(2, 409)=4.31, p<.05	3 > 2
		2. 11-22 years	135	9.13	2.56		
		3. 23-41 years	140	10.01	2.34		
JCS	Profession	1. Nurses	346	11.58	3.03	*t*(418)=2.80, p<.01	---
		2. Physicians	74	12.68	3.23	*F*(2, 406)=5.90, p<.01	1 e 3 > 2
	Length of Employment	1. 0-10 years	138	11.99	3.30		
		2. 11-22 years	133	11.01	3.04		
		3. 23-41 years	138	12.22	2.88		
SaW	---	---	---	---	---	---	---
WCs	Profession	1. Nurses	347	11.84	3.25	*t*(420)=3.06, p<.01	---
		2. Physicians	75	13.07	2.69		
	Length of Employment	1. 0-10 years	138	12.32	3.22	*F*(2, 408)=4.17, p<.05	1 e 3 > 2
		2. 11-22 years	135	11.39	3.25		
		3. 23-41 years	138	12.39	3.07		
EEn	Profession	1. Nurses	282	8.13	2.87	*t*(351)=3.33, p < .01	---
		2. Physicians	71	9.14	3.21		
	Age	1. 24-40 years	116	8.14	2.42	*F*(2, 348)=3.35, p<.05	3 > 1 e 2
		2. 41-50 years	142	8.19	2.35		
		3. 51-69 years	93	8.88	2.02		

WRQoL=Work-related quality of life; CaW=Control at work; GWB=General well-being; HWI=Home-work interface; JCS=Job and career satisfaction; WCs=Working conditions; EEn=Employee Engagement; *SD*=Standard deviation.
Note. The dotted line for GWB and SaW means that no significant difference between groups was found for these subscales.

correlations, albeit moderate and small, are significant gives an initial demonstration of the discriminant validity of the WRQoL subscales.

Discussion

According to this first assessment, we can conclude that the Italian version of WRQoL is a brief and fairly reliable tool that can be readily used by occupational health services in screening and evaluating this fundamental construct. This tool has the advantage, compared to other scales, to allow researchers and professionals to measure quality of life in organizational contexts where a general scale would not be sufficiently informative. Furthermore, this scale has the advantage of not being strongly affected by extra-occupational factors, thus allowing researchers and professionals to focus their analysis and interventions on those organizational and psychosocial factors directly linked to the working con-

text. Recently, a number of projects and programs aimed at promoting workers' well-being in the workplace have been carried out, at both the planning and evaluation stage, by administering scales to evaluate quality of life (2, 28). This tool can thus be useful in the abovementioned stages in order to orientate efforts and investments in the field of workplace health promotion.

From a methodological standpoint, although the item formulation and organization/presentation is not completely satisfactory (e.g., some of the items are too long and overlap with each other), the items do not show significant distortions from the normal distribution and, having fairly good psychometric properties, appear to be useful for identifying all the hypothesized subdimensions.

The seven identified subdimensions show Cronbach's alphas above the cut-off value of .70 except for SaW, and the alphas for CaW and JCS only just reach the minimum acceptable value. The fairly good internal reliability of the subscales is also supported by an equally fairly good CFA solution, revealing all fit indices above or very close to the suggested cut-off values (26), with the exception of CFI, which is below the ideal value.

Another important point concerning CFA is that the value of the correlation between the subscales CaW and JCS and that of GWB and SaW are not in line with our expectations. In particular, the high correlation between CaW and JCS would require further investigation to test whether these two subscales can be considered separate.

All the other characteristics of the CFA, including factor loadings and goodness of fit indices, are good. In this regard, we are well aware that, despite being a fairly common practice (22, 37) and acknowledged by outstanding methodologists (8), the correlation of errors between items can be considered a limitation. Indeed, in this study, we had to correlate errors between different subdimensions of the scale in two out of three cases, and this might have partly compromised the goodness of the chosen solution, making it weaker. In addition, to obtain a reasonably good internal reliability and a fairly good CFA solution, we had to change three subscales, adding one item to CaW, deleting one from JCS and two from SaW. The former two subscales thus do not follow the structure of either the first or the second version of the WRQoL scale and cannot be compared across studies adopting the classical version of the scale.

Regarding the subscale of SaW, it has now the same two items that were used in the first version of the WRQoL scale. The observation that the SaW subscale appears to be the least strong of all WRQoL scale dimensions may be due to the low value of the alpha, the insufficient number of items in the subscale, the too low correlation with GWB and, as stated below, the lack of difference in terms of socio-demographic characteristics. The unsatisfactory structure of SaW could partly be ascribed to cultural differences that can play a central role in the perception of stress in the workplace (17). In particular, it is necessary to consider the peculiar nature of the different contexts and the specific variations between countries in the occupational stress culture (33). For this reason, the dimensionality of the SaW scale may differ from the previous contexts in which it was validated.

In addition, it is important to point out that the unsatisfactory value of the CFI fit index is a characteristic that should not be underestimated, particularly because, as it is an incremental fit index, its meaning differs from the other indices.

Lastly, the subscales – except for GWB and SaW – differentiate between groups of people involved in the questionnaire administration according to several socio-demographic characteristics such as profession, age and length of employment. The first characteristic (i.e., profession), above all, seems to be particularly relevant when it comes to emphasizing differences among the WRQoL subscales. The fact that we did not find any significant difference for gender is another aspect that warrants further investigation.

As expected, the subscales of the WRQoL were correlated with musculoskeletal disorders. In particular, the three subscales evaluating aspects that may have a greater influence on workers' physical issues (i.e., GWB, SaW, and WCs) were more correlated with upper-limb musculoskeletal disorders. It seems reasonable that the other subscales were less correlated with these issues.

Overall, the 25-item Italian version of the WRQoL scale presented in this study (Box 1) seems to be an easy-to-use and reasonably meaningful tool to assess the different dimensions of the quality of

Box 1. Italian version of the WRQoL

Durante la compilazione, risponda in modo spontaneo senza troppe riflessioni perché è più importante conoscere la sua prima reazione. Non ci sono risposte "giuste" o "sbagliate": sia spontaneo, perché così ci permetterà di misurare il suo atteggiamento nei confronti dei fattori che influenzano la sua esperienza al lavoro. Gentilmente, non salti alcuna domanda.

Per favore indichi le sue risposte ponendo un segno negli appositi spazi

In che misura è d'accordo con le seguenti affermazioni? Si prega di segnare lo spazio appropriato		Forte disaccordo	Disaccordo	Neutrale	Accordo	Forte accordo
1.	Mi sento in grado di esprimere opinioni e influenzare i cambiamenti nella mia area di lavoro	O	O	O	O	O
2.	Attualmente mi sento bene	O	O	O	O	O
3.	Il mio datore di lavoro mi fornisce soluzioni adeguate e flessibilità tali da permettermi di conciliare il lavoro e la mia vita privata	O	O	O	O	O
4.	I miei attuali ritmi e orari di lavoro si adattano alle mie necessità individuali	O	O	O	O	O
5.	Mi sento spesso sotto pressione a lavoro	O	O	O	O	O
6.	Il mio diretto superiore riconosce quando faccio un buon lavoro	O	O	O	O	O
7.	Sono soddisfatto della mia vita	O	O	O	O	O
8.	Sono incoraggiato a sviluppare nuove competenze	O	O	O	O	O
9.	Sono coinvolto nelle decisioni che mi riguardano nella mia area di lavoro	O	O	O	O	O
10.	Il mio datore di lavoro mi fornisce ciò di cui ho bisogno per svolgere efficacemente il mio lavoro	O	O	O	O	O
11.	La mia vita è pressoché ideale nella maggior parte degli aspetti	O	O	O	O	O
12.	Lavoro in un ambiente sicuro (dal punto di vista infortunistico)	O	O	O	O	O
13.	Generalmente le cose mi vanno bene	O	O	O	O	O
14.	Sono soddisfatto delle mie opportunità di carriera disponibili in questa azienda	O	O	O	O	O
15.	Spesso sento livelli eccessivi di stress sul lavoro	O	O	O	O	O
16.	Sono soddisfatto della formazione che ricevo per svolgere il mio attuale lavoro	O	O	O	O	O
17.	Di recente mi sono sentito abbastanza felice	O	O	O	O	O
18.	Le condizioni di lavoro sono soddisfacenti	O	O	O	O	O
19.	Sono coinvolto nelle decisioni che riguardano direttamente gli utenti finali del mio lavoro	O	O	O	O	O
20.	Sono in grado di raggiungere un buon equilibrio tra il mio lavoro e la mia vita privata	O	O	O	O	O
21.	L'azienda comunica bene con i suoi dipendenti	O	O	O	O	O
22.	Sono orgoglioso di dire agli altri che faccio parte di questa azienda	O	O	O	O	O
23.	Consiglierei ad amici/parenti questa come una buona azienda in cui lavorare	O	O	O	O	O
24.	Ho sufficienti opportunità di porre domande ai Manager dell'azienda riguardo ai cambiamenti sul lavoro	O	O	O	O	O
25.	Sono felice dell'ambiente fisico in cui lavoro (es. spazi, rumore, luce…)	O	O	O	O	O
26.	Sono soddisfatto della qualità complessiva della mia vita lavorativa	O	O	O	O	O

life at work in many settings. Because of its characteristics, such as brevity and readiness, the WRQoL scale can be self-administered. Nevertheless, given that the sample of this study was only made up of people with a medium-high education level, further studies are clearly needed to evaluate this scale reliability in subjects with a lower educational level.

This tool does not substitute other scales commonly used to evaluate stress at work (1, 25) but it can be considered as complementary to them.

Since the evaluation of work-related stress is mandatory in Italy, in line with the recommendations of the Legislative Decree 81/2008 (13), we believe that our tool could be instrumental in making these evaluations more complete due to its focus on individual and organizational well-being. Indeed, the Italian WRQoL version described in this study has the potential to provide useful information to draw guidelines for employees' well-being. In particular, its assessment may contribute to the formulation of employers' actions on the dimensions that show critical scores, such as interventions to improve work-life balance or motivation at work (7, 30). This could then result in improved business outcomes, such as increased organizational performance and decreased absenteeism and/or turnover (27).

Considering the limitations to this validation and those linked to the scale investigated, we suggest re-testing the scale on a larger sample, more heterogeneous in terms of hospitals involved and areas of the country invited to participate in the administration and, above all, with a longer questionnaire, which would add scales to test for the discriminant validity or the predictive validity of the tool in greater depth.

Further developments of this study will consist in using this scale in other work settings to facilitate early recognition of potentially harmful situations, thereby preventing secondary health conditions, such as musculoskeletal disorders (38), arising when psychological work well-being is compromised. Furthermore, by investigating WRQoL in occupational health research, it may be possible to shed light on the nomological network of this phenomenon.

Taken altogether, our findings indicate that the use of the WRQoL scale can contribute to a more complex and complete evaluation of the psychological well-being at work due to its multidimensionality. Moreover, the use of this tool in occupational health practice is recommended when monitoring workers' well-being and its variation after concrete steps taken to tackle work-related health issues.

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Informazioni per gli autori:

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What does this manuscript add to what is already known?
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How might this impact clinical practice or risk assessment and management?
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