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A Danish version of the 19-item return-to-work self-efficacy (RTWSE-19) questionnaire was developed. The performance of a questionnaire may differ between populations and in various cultures. In order to use the RTWSE-19 in a Danish context, translation was necessary, and cross-cultural and conceptual adaptation needed to preserve the original purpose of the instrument.

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Original article

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Cross-cultural adaptation and validation of the Danish version of the 19-item return-to-work self-efficacy (RTWSE-19) questionnaire

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Objectives The aim of this study was to perform a cross-cultural adaptation of the return-to-work self-efficacy (RTWSE-19) scale into Danish and test the reliability, validity and responsiveness of the final version.

Methods The adaptation process followed standard guidelines and the pretest was performed on 40 sickness absence beneficiaries. Tests of reliability, validity and responsiveness of the final version was performed on 782 participants of whom 440 (56%) responded. For the sub- and global scales, internal consistency was evaluated by Cronbach's alpha and reproducibility using paired t-test and intraclass correlation coefficient (ICC), respectively Responsiveness was evaluated by paired t-test and the association between RTWSE-19 and job status at ten weeks was tested in a logistic regression model, adjusted for gender, age and baseline job status.

Results The face validity and reliability of the Danish version of the RTWSE-19 questionnaire were satisfactory. The internal consistency (alpha) for the three subscales ranged from 0.93 to 0.97. A test-retest showed no difference as well as high ICC between scale scores at baseline and one week later. The content validity of the final version was confirmed. High baseline RTWSE-19 level was associated with being at work after ten weeks odds ratio (OR) 3.24, 95% confidence interval (95% CI) 1.48–7.07.

Conclusions The RTWSE-19 cross-cultural translation to Danish was performed satisfactorily. A modified final version was produced, and the test of the instrument's reliability and validity showed that the psychometric properties of the questionnaire were partly confirmed. The instrument may be useful in rehabilitation practice to guide further assessment, goal setting and RTW decision-making.

Key terms occupational rehabilitation; pretest; reliability; RTW; translation; validity.

Long-term sickness absence from work is a significant public health problem in Western countries because of the relatively high risk of permanent labor market exclusion and the increasing inflow into benefit dependency (1–3). Considering the implications for the worker's quality of life and the significant costs incurred by sickness absence, improving the return-to-work (RTW) process for people who are on sickness absence is important (2, 3).

Self-efficacy is an important cognitive factor in the RTW process (4, 5). Self-efficacy has roots in social cognitive theory and is defined by Bandura as the beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments (6).

Self-efficacy plays a key role in decisions and behaviors concerning job and career development (6, 7) and it has proven to be predictive of future work participation and RTW after being on long-term sickness absence (4, 5, 8–11). In a prospective study, Fitzgerald et al (12) found self-efficacy to be a strong predictor of RTW one month after coronary artery bypass grafting. In a study focusing on both musculoskeletal health conditions,

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other physical health conditions and mental health conditions, Brouwer et al (13) found self-efficacy to be a predictor of time-to-RTW. Furthermore, it has been shown that higher self-efficacy scores seem to be a protective factor of failure to attempt RTW two years after baseline (14).

Expectancy beliefs with regard to returning to work is of interest in the RTW process, and screening for self-efficacy perceptions among workers of sickness absence is important in occupational rehabilitation in order to address the level of support correctly (15).

Despite different national contexts and different forms of benefit schemes, many countries share common concerns over work incapacity, sickness absence, and RTW. It seems that countries typically focus on the definition and onset of incapacity and availability of treatment and rehabilitation services, whereas the individual expectations for and confidence in their RTW ability are neglected (16). Assessment of self-efficacy and motivation as indirect measures of work capacity with respect to RTW calls for instruments applicable to practice.

The 19-item RTW self-efficacy (RTWSE-19) scale is based on self-report to assess workers' confidence in meeting job demands and current beliefs in their own ability to return to work (10). The rationale behind the RTWSE-19 was to provide a scale about the individuals' concerns about RTW across a wide range of job and employer types. The performance of a questionnaire may differ between populations and in various cultures (17, 18). In order to use the RTWSE-19 in a Danish context, translation was necessary, and cross-cultural and conceptual adaptation needed to preserve the original purpose of the instrument (17). Guidelines for this process are provided by Beaton et al (17). The objective of this article was to perform a cross-cultural adaptation of the RTWSE-19 questionnaire into Danish and to test reliability, responsiveness and the association with self-reported job status.

Methods

Shaw et al developed the RTWSE-19 questionnaire, originally a 28-item scale developed from qualitative research findings in a population of workers with occupational low-back pain (4). The questionnaire has been found to be predictive of disability outcomes and validated in study populations of both musculoskeletal and mental disorders (5, 8, 11). The RTWSE-19 was validated and reduced from 28 to 19 items, and in the present study the 19-item RTWSE-19 was used.

Study participants are asked if they could overcome a number of RTW barriers with 1–10 response categories (1=not at all certain, 10=completely certain). In the 19-item version, the internal consistency of total self-efficacy score was 0.96 (10). Total mean scores are calculated and the higher the score, the higher the self-efficacy. Three underlying subscales were identified in the validation of the orginal version: meeting job demands, modifying job tasks, and communicating needs to others, with internal consistencies of 0.98, 0.92, and 0.81, respectively (10). Subscale mean scores are calculated and the higher the score, the better. Total score and subscales containing >20% missing values were excluded from the analysis (18). The original version is included in Appendix A (www.sjweh.fi/index.php?page=data-repository).

Translation and cross-cultural adaptation process

The translation and cross-cultural adaptation process was conducted in collaboration between RTW research experts from Public Health and Quality Improvement, Central Denmark Region, and the National Center for Occupational Rehabilitation, Norway, (no Norwegian translation was performed) and external bilingual translators. The methodology of the cross-cultural adaptation of the questionnaire followed a systematic 5-step procedure according to Beaton et al (17), ie, forward translation (step 1), panel synthesis of the translation (step 2), back translation (step 3), consolidation and revision by an expert committee (step 4), and finally pretesting (step 5). Members of the expert committee (RTW researchers) evaluated face validity throughout the cross-cultural adaptation process and through qualitative analysis of the comments provided by participants in the pretest.

The pretest was performed in order to evaluate comprehensibility of the translated questionnaire. This was carried out in a group of 40 working-age sick-listed adults, recruited by a social worker at their first visit to a municipal employment agency after a minimum of 8 weeks of sickness absence. In the pretest, participants responded to written questions immediately after completing the RTWSE-19 questionnaire. The questions sought opinions regarding the layout, wording of the instructions and items, missing aspects, acceptability, and the questionnaires in general. This allowed the researchers to identify the participants' opinion on the questionnaire's usability, applicability, and completeness. The participants' written answers were used as fulltext data to determine the "clarity" of items, detect ambiguous items, and identify dilemmas in the process of the pretest implementation. The expert committee then discussed whether changes in the questionnaire were necessary. A synthesis report was written on the problems and how they were solved. Items with idiomatic challenges in the cross-cultural adaptation are marked with an asterix (Appendix A).

Testing for reliability, validity and responsiveness

After the completion of the 5-step cross-cultural adaptation process, the final version of the questionnaire was tested to ensure that the RTWSE-19 demonstrated comparable and adequate measurement properties regarding reliability, validity, and responsiveness (18, 19, 20).

Participants

The final version of the RTWSE-19 questionnaire was administered in two different settings: a municipal employment agency (N=685) (88%) and three hospital wards (N=97) (12%). In Denmark, municipal employment agencies are required by law to interview all sickness absence beneficiaries after the 8th week of sickness absence (T0) and obliged to conduct follow-up interviews until the individual's situation is clarified. The questionnaire was administered at the time of the required interview. At the hospital, only patients who had >8 weeks of sickness absence was invited to participate.

To be eligible for inclusion, participants had to be older than 18 years and speak Danish. Two further inclusion criteria for participants recruited at the employment agency were (i) being currently employed and (ii) having ≥8 weeks of sickness absence at the time of inclusion.

A social worker at the employment agency and a clinical assistant at the hospital wards invited the sick-listed to participate. Details of the study were described to the participants, and the social worker and clinical assistants addressed any possible questions and concerns. Participation was voluntary.

After giving verbal consent (T0, baseline), employment agency participants completed the questionnaire. They were then asked to provide their email address and received a second [T1 (7–15 days)] and third [T2 (8–12 weeks)] questionnaire, with a reminder after 4 days if no response was given.

At the hospital, patients were handed the T0 and T1 questionnaire at times when they had a scheduled consultation. They were asked to provide their email address to receive the third (T2) questionnaire, which was in the form of a website link. As a result, reminders could not be sent to the patients.

Additional questionnaire-obtained data

Participants provided information about age at T0, gender, education level (low <3 years, middle 3–4 years, high >4 years), type of work (manual, non-manual, or mixed), and current job status (at work, not at work). Respondents stated whether or not they had a chronic health condition (yes, no). At T2, the participants also gave information about current job status.

Statistical analysis

The internal consistency of both the RTWSE-19 global and subscales was evaluated by means of Cronbach's α. Values of 0.70–0.95 were considered acceptable (18).

Reliability evaluates the degree to which the measurement is free from measurement error (19, 20). Intraclass correlation coefficients (ICC) were calculated for the sub as well as the global scale. ICC of 0.4–0.75 were considered fair, while ICC >0.75 were considered excellent (21). In order to test the reproducibility, a test-retest analysis was performed with second assessments after 7–15 days (18). Averages of the global and subscale mean scores were plotted against the corresponding differences between T0 and T1 responses in a Bland-Altman plot with 95% limits of agreement (22). The test-retest reliability was tested by paired t-test. The assumptions behind paired t-test were appraised from the Bland-Altman plots.

In addition, possible floor and ceiling effects were identified. Floor or ceiling effects are considered to be present if >15% of respondents achieved the lowest or highest possible score, respectively (23). If floor or ceiling effects are present, it is likely that extreme items are missing in the lower or upper end of the scale, indicating limited content validity (18).

To test the ability of the RTWSE-19 to detect changes over time, a follow-up (T2) was made 8–12 weeks after T0. Averages of the global and subscale mean scores were plotted against the corresponding differences between T0 and T2 responses in a Bland-Altman plot with 95% limits of agreement (22). The responsiveness was tested by paired t-test. The assumptions behind paired t-test were appraised from the Bland-Altman plots.

A logistic regression analysis was conducted to test the predictive validity between baseline total score RTWSE-19 and job status at T2. The total score of RTWSE-19 was dichotomized at ≤7.5 and >7.5, representing low and high RTW self-efficacy, respectively (10). Crude and adjusted (gender, age and baseline current job status) odds ratio (OR) are reported.

All statistical analyses were performed with Stata 13.1 (StataCorp, College Station, Texas USA). Significance level was set at $P<0.05$ for all statistical tests.

Ethics

Approval for the use of questionnaire data was obtained from the Central Region Denmark (Danish Data Protection Agency j. no. 1-16-02-404-14). According to Danish law, approval from the Danish National Committee on Biomedical Research Ethics (www.cvk.sum.dk) was not relevant as this is only provided for projects using biological material or involves biomedical treatment. Participation in the study was voluntary, and answers were

processed anonymously. The research process followed the ethical principles stated in the Helsinki Declaration.

Results

Translation and cross-cultural adaptation process

The translation of the questionnaires was carried out with some difficulty. The goal was to maintain the meaning of the original items, however, some changes were inevitable for improving clarity of meaning in a Danish context as well as adapting it to Danish culture. Instead of the words "pain, discomfort, or re-injury" (items 1, 3, 8, 10, 12, 17, and 19), the Danish equivalent of "discomfort" was used. In item 16, "injury" was translated to "health problems". In items 1, 3, 10, 14, 19, the Danish equivalent of "reduce" was used in the first versions of the translation, but during the process of panel synthesis (step 2), this word was replaced by a more common and daily used Danish term in all abovementioned items to enhance comprehensibility.

The original wording in item 5 "expectations for job performance" was at first translated to "expectations for work performance", in Danish. However, during the process of panel synthesis in step 2, the wording was changed to "meet the requirements of your job" to accomplish the practical use of the term in Danish. In item 19, the "work station" or "work area" was changed to "workplace" in Danish. Item 15 "Do everything you're trained to do?" was the only item changed after back-translation. The back-translation revealed that the wording of the item differed from the original English version. The difference was discussed in the expert committee and determined to be a result of cultural differences between the Danish and English language, and therefore it was changed to "using all your competencies in your work?" in Danish. The Danish consensus version of the RTWSE-19 is available from www.marselisborgcentret.dk/fileadmin/filer/Publikationer/PDF_er/Mulighed_for_at_vende_tilbage_til_arb_marked_040516__2_.pdf

Pretest

The pretest showed that a majority of the participants were positive regarding the usability, comprehensibility and completeness of the questionnaire. Apart from being positive, 13 of the 40 participants had no remarks at all. However, 20% of the participants mentioned that the instructions were not clear in terms of the meaning of "return to work". Consequently, in the final version of the questionnaire's instructions, the meaning was elaborated, explaining that "return to work" could refer to "return to the same job, return to a new job, return to a job at reduced hours or return to the same job but with different responsibilities". The layout of the 1–10 Likert scale was also modified based on the remarks and wishes of the participants in the pretest. It was mentioned that the items were difficult to answer if the responder was self-employed and/or without colleagues, a subtitle explaining this was added. Furthermore, it was mentioned that the items seemed to refer to physical health problems to the exclusion of psychological health problems. Some wanted the questionnaire to offer the opportunity to provide comments, which was not followed. No remarks on single specific items were made.

Following the pretest, the expert committee considered the face validity of the final version good.

Sample characteristics of final version

Of the 782 participants, 440 (56%) responded to the RTWSE-19 questionnaire. Non-responder analyses showed no significant differences between the responders to the RTWSE-19 and non-responders with respect to age and gender (results not shown).

Of the 440 participants in the study, 354 (80%) were recruited at the municipal employment agency and 86 (19%) were recruited at the three hospital wards (table 1). Data concerning education, work type, and chronic condition were obtained from a subgroup of responders. No significant differences were found between the responders from the municipal employment agency and

Table 1. Characteristics of responders (N=440). [M=median; IQR=interquartile range]

	Employment agency (N=354)				Hospitals (N=86)				P-value
	N	%	M	IQR	N	%	M	IQR	
Age (years)			45	37–53			48.5	41–53	0.25 [b]
Missing	0				54				
Gender									0.75 [a]
Female	220	62			22	59			
Male	134	38			15	17			
Missing	0	0			49	57			
Education level									0.66 [a]
Low	30	8			4	5			
Middle	44	12			12	14			
High	20	6			4	5			
Missing	260	73			66	77			
Work type									0.74 [a]
Manual	39	11			11	13			
Non-manual	33	9			5	6			
Mixed	22	6			5	6			
Missing	260	73			65	76			
Chronic condition									0.05 [a]
Yes	31	8			12	14			
No	62	18			7	8			
Missing	261	74			67	78			
Total self-efficacy score			6.3	4–9	6.2		6.2	4–8	0.4 [b]

[a] Chi^2 test.
[b] Wilcoxon rank sum test.

Table 2. Reliability, floor and ceiling effects of scores in the Danish version of return-to-work self efficacy (N=440). [95% CI=95% confidence interval; IQR=interquartile range; SD=standard deviation]

Scale [a]	Descriptive statistics, baseline								
	Cronbach's alpha	Mean	SD	Median	IQR	% at floor	95% CI	% at ceiling	95% CI
Meeting job demands	0.97	5.7	2.9	5.7	3.0–8.9	8	5–10	10	7–13
Modifying tasks	0.94	5.8	2.7	5.7	3.6–8.1	5	3–7	7	5–10
Communicating needs	0.93	7.1	2.8	8.0	5.0–9.5	4	3–7	20	17–24
Total	0.97	6.1	2.6	6.2	3.9–8.3	3	1–5	5	3–7

[a] Each subscale is scored from 1–10. Higher scores indicate higher degree of confidence.

Table 3. Test and retest reliability of scores in the Danish version of return-to-work self efficacy (N=125). [95% CI=95% confidence interval; ICC=intraclass correlation coefficients; SD=standard deviation]

Scale [a]	First mean	SD	Second mean	SD	Difference	SD	P-value [b]	ICC	95% CI
Meeting job demands	5.87	2.8	6.00	2.6	-0.13	1.6	0.37	0.82	0.76–0.88
Modifying tasks	5.93	2.6	6.03	2.5	-0.10	1.5	0.48	0.81	0.75–0.87
Communicating needs	7.38	2.5	7.29	2.6	0.09	1.4	0.51	0.84	0.79–0.89
Total score	6.29	2.4	6.35	2.3	-0.07	1.4	0.59	0.84	0.79–0.89

[a] Each subscale is scored from 1–10. Higher scores indicate higher degree of confidence.
[b] Matched samples t-test.

those from the three hospital wards regarding education and work type. However, significantly more hospital participants had a chronic condition than their counterparts from the municipal employment agency. The age of participants ranged from 20–65 [median 45, interquartile range (IQR) 37–53] years and 24–60 (median 48.5, IQR 41–53) years in the agency and hospital wards, respectively. A majority of participants were women, 62% and 59%, respectively. Because of no significant differences between the two groups with regard to gender, age, and total RTWSE score, all 440 participants were merged to a single group in the analyses (table 1).

Descriptive statistics of the RTWSE-19 scale

Mean and standard deviation (SD) as well as median and IQR for the global and three subscales at baseline are shown (table 2), with higher scores indicating higher RTWSE. The mean total score of the RTWSE-19 was 6.1 (SD 2.6) (median 6.2, IRQ 3.9–8.3). The communicating needs subscale showed the highest scale mean of 7.1 (SD 2.8) and median of 8.0 (IRQ 5.0–9.5).

Evaluation of translated version's psychometric properties

Reliability. Cronbach's α was calculated for the global and subscales. All α were acceptable and ranging from 0.93 (communicating needs) and 0.94 (modifying tasks) to 0.97 (meeting job demands and total score) (table 2).

Floor or ceiling effect. No floor or ceiling effects in total scores and subscales were found, except for communicating needs, where 20% of the participants scored the maximum of 10 thereby exceeding the 15% threshold (23) (table 2).

A total of 125 (16%) completed the retest within 7–15 days after the baseline test. The median duration between the two tests was 7 days (IQR 7–10). Averages and differences in scores between T0 and T1 are shown in (figure 1). Paired t-tests showed no significant differences between T0 and T1 in either the global (difference -0.07, SD 1.4) or any of the subscales (table 3). The ICC ranged from 0.81 (95% CI 0.75–0.87) for modifying job tasks to 0.84 (95% CI 0.79–0.89) for communicating needs and total score (table 3), indicating high reliability of the questionnaire.

Responsiveness

A total of 116 (15%) completed the follow-up RTWSE-19 questionnaire after a median of 10.4 (IQR 10–11) weeks (T2).

Averages and differences of scores between T0 and T2 are shown in figure 2. Paired t-tests showed no significant differences between T0 and T2 in the global scale 0.25 (95% CI -0.60–0.10), meeting job demands 0.19 (95% CI 5.47– 6.76), modifying tasks 0.19 (95% CI 5.47–6.76), or communicating needs 0.05 (95% CI -0.53–0.62) (results not shown).

Predictive validity, association between baseline global score and self-reported current job status at T2

A total of 149 participants responded to both T0 and T2 questionnaires regarding RTWSE-19 and job status, respectively. Of those, 86 (58%) were currently at work

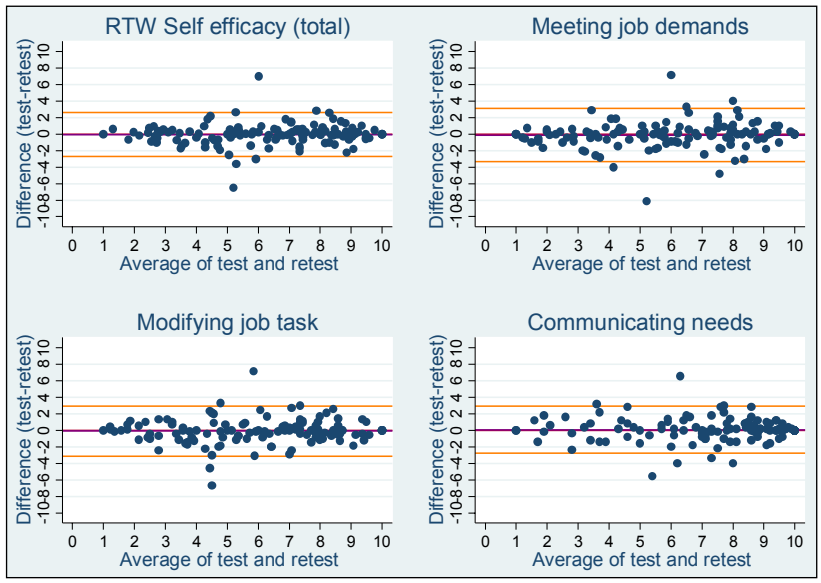

Figure 1. Test-re-test, averages and differences of total RTW-SE scores between T0 and T1 (N=125).

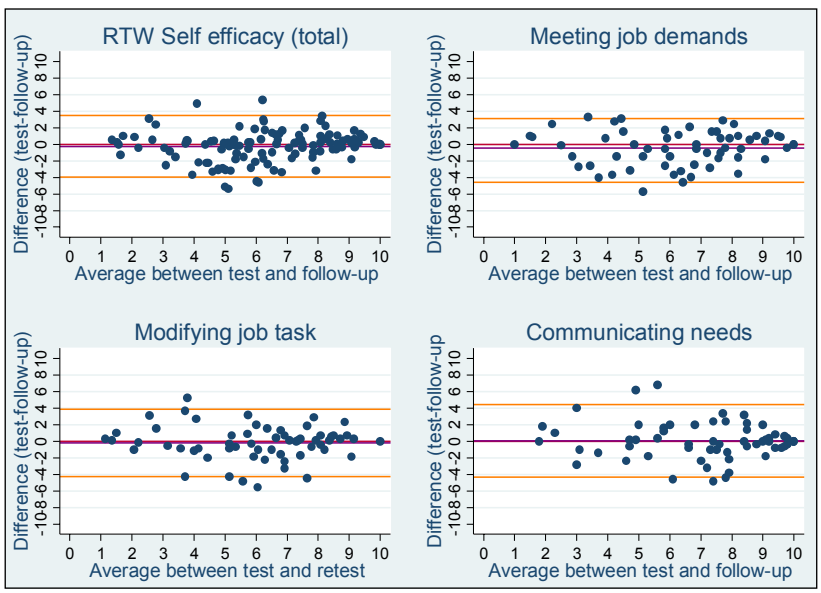

Figure 2. Responsiveness, averages and differences of scores between T0 and T2 (N=60).

at T2. The adjusted odds of being at work at T2 was statistically significantly higher among those with a high baseline total score RTWSE-19 than those with a low score OR_{adj} 3.24 (95% CI 1.48–7.07) (table 4).

Discussion

The translation and cross-cultural adaptation of the RTWSE-19 based on standard guidelines was successful. A modified final version was produced, and the face validity, reliability and internal consistency were found to be acceptable.

The ability of the RTWSE-19 questionnaire to detect changes over time was not found, but no knowledge of treatment of the participant during the ten weeks was obtained. It cannot be ruled out that the participants' work ability failed to improve over the 10-week period, and in that case the findings of no change were accurate. The predictive validity was confirmed as a high baseline level of RTWSE increased the odds of being at work at T2. In previous studies, RTWSE has also been found to be predictive of RTW, this finding indicate that the beliefs sick-listed employees have in their own competencies with respect to RTW play a key role in the RTW process (5, 10). Two studies found that RTWSE is a robust predictor of RTW for sick-listed employees with

Table 4. The association between baseline RTWSE-19 (return-to-work self efficacy) and self-reported job status at 10 weeks follow-up (N=149). [OR=odds ratio; 95% CI=95% confidence interval]

	N	%	OR_{crude}	95% CI	OR_{adj}	95% CI
RTWSE total score						
Low (≤7.5)	89	60	1.00	..	1.00	..
High (>7.5)	60	40	4.03	1.94–8.35	3.24	1.48–7.07
Gender (men)	54	36	.	..	0.48	0.23–1.01
Age	.	.	.	..	1.03	0.99–1.07
Baseline job status (at work)	29	19	.	..	3.16	1.10–9.06

common mental disorders (8, 9) and the findings in this study implicate that the RTWSE-19 questionnaire can be used across diagnoses and health conditions.

Regarding floor and ceiling effect, our findings were acceptable and similar to those in the original study (10). Only the subscale communicating needs exceeded the threshold of 15% with regards to ceiling effects, reflecting limited content validity.

Strengths and limitations of the present study should be noted. Firstly, the sample sizes meet the recommendations with respect to assessing agreement and reliability (18). Not testing the concurrent validity of RTWSE-19 with other existing questionnaires – such as the Readiness to Return to Work Questionnaire (24) or the 1-item work ability measure (25) – can be seen as a limitation.

Data concerning education, work type, and chronic condition were obtained from a subgroup of the RTWSE responders, and no significant differences were found between the responders from the municipal employment agency and the responders from the three hospital wards with regard to education and work type. Besides, there was no difference between the two groups' regarding level of RTWSE-19.

Despite previous studies comparing electronic- and paper-and-pencil-administered outcomes indicate no differences between these two assessment methods (26), the use of different assesment methods in the two settings (hospital: paper version versus municipal employment agency: web-based version) could potentially have induced bias. However, the abovementioned analyses showed no differences in RTWSE-19 score between the two groups indicating that this may not the case.

Implications

Translation of such scales into different languages and contexts has both practical and theoretical significance as employer regulations and policies in this domain vary substantially across cultures and jurisdictions. The Danish consensus version of the RTWSE questionnaire appears to exhibit acceptable psychometric properties in terms of validity, internal consistency and test-retest reliability. The RTWSE-19 measure addresses an important factor for improving occupational health and work environmental support. Finally, the instrument covers different aspects and may be used in different phases in rehabilitation practice to guide further assessment, goal setting and RTW decision-making. Use of questionnaires may at the same time strengthen the individual person's participation in the RTW process.

Conflict of interest

The authors declare no competing interests.

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