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*Published in:*  
European journal of cancer care

*DOI:*  
[10.1111/ecc.13420](https://doi.org/10.1111/ecc.13420)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2021

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Dorland, H. F., Abma, F. I., Roelen, C. A. M., Bültmann, U., & Amick, B. C. (2021). Validation of the Work Role Functioning Questionnaire 2.0 in cancer patients. *European journal of cancer care*, [e13420]. <https://doi.org/10.1111/ecc.13420>

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## ORIGINAL ARTICLE

# Validation of the Work Role Functioning Questionnaire 2.0 in cancer patients

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## Funding information

This research project was funded by the Dutch Cancer Society (RUG2011-5266). The funding institute had no role in the design, collection, analysis and interpretation of data; in the writing of the manuscript; and in the decision to submit the manuscript for publication.

## Abstract

**Objective:** The Work Role Functioning Questionnaire 2.0 (WRFQ), measuring the percentage of time a worker has difficulties in meeting the work demands for a given health state, has shown strong reliability and validity in various populations with different chronic conditions. The present study aims to validate the WRFQ in working cancer patients.

**Methods:** A validation study of the WRFQ 2.0 was conducted, using baseline data from the longitudinal Work Life after Cancer study. Structural validity (Confirmatory Factor Analysis, CFA), internal consistency (Cronbach's alpha) and discriminant validity (hypothesis testing) were evaluated.

**Results:** 352 working cancer patients, most of them diagnosed with breast cancer (48%) and 58% in a job with mainly non-manual tasks, showed a mean WRFQ score of 78.6 (SD = 17.1), which means that they had on average difficulties for 78.6% of the time they spent working. Good internal consistency ( $\alpha = 0.96$ ) and acceptable to good fit for both the four and five-factor model (CFA) was found. The WRFQ distinguished between cancer patients reporting good vs. poor health (80.3 vs. 73.0,  $p = 0.001$ ), low vs. high fatigue (82.0 vs. 72.2,  $p < 0.001$ ), no vs. clinical depression (80.4 vs. 58.8,  $p < 0.001$ ) and low vs. high cognitive symptoms (86.1 vs. 64.7,  $p < 0.001$ ).

**Conclusions:** The WRFQ 2.0 is a reliable and valid instrument to measure work functioning in working cancer patients. Further psychometric research on responsiveness is needed to support its use in health practice.

## KEYWORDS

cancer patients, confirmatory factor analysis, discriminant validity, internal consistency, validity, Work Role Functioning Questionnaire 2.0

## 1 | INTRODUCTION

More and more cancer patients resume work during or after treatment, partially due to medical advances (e.g. earlier diagnosis, better treatment) (Amir et al., 2008; Hofmann, 2005; Mehnert,

2011). Participating in work is important from both a societal and personal perspective, as it provides an income and can provide self-esteem, personal identity and social contacts (Hofmann, 2005; Peteet, 2000; Rasmussen & Elverdam, 2008). However, little attention has been paid to the problems the expanding group

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of working cancer patients experience in meeting job demands. Most studies to date focus on return to work, work status or work disability (Duijts et al., 2014), while cognitive problems and fatigue may impact cancer patients' functioning at work during treatment or after return to work (Deimling et al., 2006; Gandubert et al., 2009; Koppelmans et al., 2012; Wagner & Cella, 2004; Wefel et al., 2004).

Previously, it was shown that cancer patients with persistently low work functioning in the year following return to work (RTW) reported higher levels of fatigue, depressive symptoms and cognitive symptoms experienced at work (i.e. diminished memory, executive function, attention and information processing speed (Schagen & Wefel, 2013), compared to cancer patients with moderate or high work functioning during the year following RTW (Dorland et al., 2017; Ehrenstein et al., 2020). Work functioning was measured with the Work Role Functioning Questionnaire (WRFQ) version 2.0, re-designed for a 21st century workforce (Abma et al., 2013). The WRFQ was cross-culturally adapted into Dutch (Abma et al., 2012) and has shown strong reliability and validity in various Dutch populations with different chronic conditions (Abma et al., 2018). However, the measure has not been validated in a population of working cancer patients, which is important to do before using it in clinical practice. For the clinical setting, it is important to be aware that cancer patients are sometimes able to work with their diagnosis and that work function can be measured to monitor their abilities to meet the demands of work. For use in clinical practice, it is, furthermore, relevant to know whether cancer patients report more difficulties on specific subscales of the WRFQ, so that occupational health professionals or clinicians in treatment or rehabilitation can pay specific attention to these difficulties. The present study therefore aims to: 1) evaluate the structural validity of the WRFQ, 2) assess the internal consistency (reliability) of the WRFQ and WRFQ subscales and 3) determine the discriminant validity of the WRFQ and WRFQ subscales in working cancer patients.

## 2 | METHODS

### 2.1 | Participant recruitment

Baseline data from the Work Life after Cancer (WOLICA) study were used. WOLICA is a longitudinal cohort study in the Netherlands, investigating cancer patients' work functioning over time (Dorland et al., 2017). Participants were recruited by occupational physicians and via cancer patient organisation websites. Inclusion criteria for WOLICA were age 18–65 years, perform paid work for at least 12 hours per week in the past 3 months and involved in paid work for at least 1 year prior to cancer diagnosis. Exclusion criteria were recurrent cancer and treatment with palliative intent. A total of 384 participants who returned to work after cancer diagnosis completed the WOLICA questionnaire, of which 352 (92%) had WRFQ data and were included in the analysis. Informed consent was obtained

from all individual participants included in the study. WOLICA was reviewed and approved by the Medical Ethical Committee of the University Medical Center Groningen (M12.125242).

### 2.2 | Work functioning

The Work Role Functioning Questionnaire 2.0 (WRFQ) was used to measure perceived difficulties in meeting work demands in the past four weeks due to physical health and emotional problems (Abma et al., 2013, 2018). The WRFQ consists of 27 items, divided into four factors: work scheduling & output demands (WSOD, 10 items), physical demands (PD, 5 items), mental & social demands (MSD, 7 items) and flexibility demands (FD, 5 items). Participants responded on a five-point scale: 0 = difficult all the time, 1 = difficult most of the time, 2 = difficult half of the time, 3 = difficult some of the time, 4 = difficult none of the time, with an additional response option 'Does not apply to my job'. Recent research has suggested that a five-factor model separating work scheduling (WSD, 4 items) and output demands (OD, 6 items) might be a more appropriate structure (Abma et al., 2018). Scores can be calculated for each subscale and for the total WRFQ. The scores on 'Does not apply to my job' were recoded as missing values. Summed scores were divided by the number of non-missing items and multiplied by 25 to obtain percentages between 0 and 100 per cent of the time. Higher scores indicate better work functioning. If more than 20% of the items of a subscale were unanswered, the scale score was set to missing.

### 2.3 | Self-rated health

The single 'All in all how do you rate your health' item from the 36-item Medical Outcomes Study Short Form (SF-36) was used to measure self-rated health (Aronson et al., 1998). Scores on a five-point scale were dichotomised as 'excellent/very good/good' versus 'fair/poor'.

### 2.4 | Fatigue

The eight-item 'fatigue severity' scale from the Checklist for Individual Strength (CIS-8) was used to measure fatigue severity in the past two weeks (Beurskens et al., 2000). The total scores were calculated by summing all items and ranged from 8–56. Low scores indicate low fatigue. A score of  $\leq 35$  was considered as low fatigue, and a score of  $>35$  as high fatigue (Beurskens et al., 2000).

### 2.5 | Depression

The nine-item Patient Health Questionnaire (PHQ-9) was used to assess depressive symptoms [17]. Total scores were summed across all nine items and ranged from 0 to 18. Low scores indicate low

depressive symptoms. A score of  $\geq 10$  was considered indicative of a clinical depression (Manea et al., 2012, 2015).

## 2.6 | Cognitive symptoms at work

The nineteen-item Cognitive Symptoms Checklist–Work Dutch Version (CSC-DV) was used to assess cognitive symptoms at work (Dorland et al., 2016). Total scores were summed, divided by the number of items completed and multiplied by 25 to get a score between 0 and 100. Lower scores indicate fewer work-specific cognitive symptoms. As cut-off scores are not yet available, scores were dichotomised on the mean split, creating low and high work-specific cognitive symptom groups.

## 2.7 | Analyses

Structural validity of the WRFQ in cancer patients was assessed with confirmatory factor analysis (CFA) using weighted least square mean and variance (WLSMV) adjusted estimators for categorical data. CFAs were conducted using M-PLUS version 8.4. Two a priori scale structures were evaluated: 1) a four-factor model originally proposed by Abma et al. (2013) and 2) a five-factor model recently proposed by Abma et al. (2018). The collective performance of the following statistical tests was used to assess model fit: overall Chi-square (ideally close to zero and non-significant value = good fit), comparative fit index (CFI,  $>0.90$  = adequate fit and  $>0.95$  = good fit), Tucker-Lewis index (TLI,  $>0.90$  = adequate fit and  $>0.95$  = good fit), root mean square error of approximation (RMSEA,  $0.05$ – $0.08$  = adequate fit,  $<0.05$  = good fit) and Standardised Root Mean Square Residual (SRMR,  $<0.08$  = acceptable fit) (Hu & Bentler, 1999). A satisfactory model requires that items load  $>0.5$  on the hypothesised factor and eventual cross-loadings on other factors should be  $<0.3$ . Model adjustments based on modification indices were considered if they indicated points of strain and were substantively meaningful. Based on CFAs and conceptual considerations (i.e. a group decision with all co-authors), the final scale structure was determined.

WRFQ scores were described based on means, range and floor and ceiling effects. Floor and ceiling effects were considered when  $>15\%$  of the participants score the highest or lowest score for that (sub)scale (Terwee et al., 2007). Additionally, scale reliability was assessed by scale internal consistency calculating Cronbach's alpha. Preferably, Cronbach alpha values between 0.70 and 0.95 (Terwee et al., 2007). Values higher than 0.95 indicate high correlations between the items and possibly item redundancy of one or more items.

Four hypotheses were formulated to test the WRFQ discriminant validity: 1) cancer patients reporting fair/poor self-rated health report lower WRFQ scores, 2) cancer patients reporting higher fatigue report lower WRFQ scores, 3) cancer patients classified as clinically depressed report lower WRFQ scores and 4) cancer patients

reporting high cognitive symptoms at work report lower WRFQ scores. Between group differences were assessed with t tests (significant when  $p < 0.05$ ). Analyses were performed for the WRFQ total scale and for the different subscales. Analyses were completed in SPSS version 24.

## 3 | RESULTS

### 3.1 | Population description

The sample consisted of 352 working cancer patients with complete WRFQ data (mean age 50.4, SD = 8.6 years); most of them were diagnosed with breast cancer ( $n = 168$ , 48%), followed by colon cancer ( $n = 37$ , 11%), lymph node cancer ( $n = 30$ , 9%) and prostate and testicular cancer ( $n = 31$ , 9%) (Table 1). Cancer patients were mainly treated with systemic therapy ( $n = 245$ , 70%). Most cancer patients ( $n = 202$ , 58%) had a job with predominantly non-manual tasks,  $n = 107$  (30%) had a job with both manual and non-manual tasks and  $n = 41$  (12%) had a job with manual tasks.

### 3.2 | Structural validity

CFA showed acceptable to good fit for the WRFQ's four-factor model with a chi-square = 820.4 ( $p \leq 0.001$ ), CFI = 0.979 and TLI = 0.971 ( $<0.001$ ) and RMSEA = 0.081 (90%CI: 0.075–0.087) and SRMR = 0.044. Similarly, the CFA showed acceptable to good fit for the five-factor model with a chi-square = 536.8 ( $p \leq 0.001$ ), CFI = 0.989 and TLI = 0.983 ( $<0.001$ ) and RMSEA = 0.063 (90%CI: 0.056–0.069), and SRMR = 0.035, see also Table 2.

With regard to the factor loadings of the four-factor model, some loads are below the cut-off for their own subscale, and above the cut-off for another subscale (MSD subscale  $n = 2$ ; FD subscale  $n = 5$ ). Also for the five-factor model, some loads are below the cut-off for their own subscale, and above the cut-off for another subscale (OD subscale  $n = 3$ ; MSD subscale  $n = 2$ ).

### 3.3 | WRFQ 2.0 description

The mean score on the WRFQ was 78.6 (SD = 17.1) (Table 3). For all subscales, ceiling effects were identified, indicating that  $>15\%$  of the participants reported the highest scores for that subscale, for example no problems meeting the work demands in that subscale. No floor effects were visible.

### 3.4 | Reliability

Cronbach's alpha was 0.96 for the total scale and varied between 0.82 and 0.93 for the subscales.

TABLE 1 Sample characteristics ( $n = 352$ )

Socio-demographics	
Gender, N (%)	
Male	124 (35)
Female	228 (65)
Age in years, mean (SD)	
	50.4 (8.6)
Education, N (%)	
Low	92 (26)
Medium	121 (34)
High	138 (39)
Job type	
Mainly non-manual tasks	202 (58)
Mainly manual tasks	41 (12)
Both manual and non-manual tasks	107 (30)
Health characteristics	
Cancer type, N (%)	
Breast cancer	168 (48)
Colon cancer	37 (11)
Lymph node cancer	30 (9)
Prostate and testicular cancer	31 (9)
Other types of cancer	86 (24)
Self-rated health, N (%)	
Excellent/very good/good, n (%)	268 (77)
Fair/poor, n (%)	79 (23)
Fatigue, mean (SD) (range 8–56)	
Total, M (SD)	30.0 (11.4)
Low fatigue, n (%)	227 (65)
High fatigue, n (%)	124 (35)
Depressive symptoms, mean (SD) (range 0–18)	
Total, M (SD)	4.5 (3.5)
No clinical depression, n (%)	316 (90)
Clinical depression, n (%)	36 (10)
Work-specific cognitive symptoms, mean (SD) (range 0–100)	
Total, M (SD)	24.7 (15.9)
Low cognitive symptoms, n (%)	167 (65)
High cognitive symptoms, n (%)	91 (35)

### 3.5 | Discriminant validity

The WRFQ total scale was able to distinguish between cancer patients reporting excellent/very good/good health vs. fair/poor health (80.3 ( $SD = 16.4$ ) vs. 73.0 ( $SD = 18.7$ ),  $p = 0.001$ ), low fatigue vs. high fatigue (82.0 ( $SD = 15.2$ ) vs. 72.2 ( $SD = 18.7$ ),  $p < 0.001$ ), no clinical depression vs. clinical depression (80.4 ( $SD = 15.1$ ) vs. 58.8 ( $SD = 20.7$ ),  $p < 0.001$ ) and low work-specific cognitive symptoms vs. high work-specific cognitive symptoms (86.1 ( $SD = 13.3$ ) vs. 64.7 ( $SD = 17.6$ ),  $p < 0.001$ ) (Table 4). No differences in discriminant validity results were found for the WRFQ subscales, except for the WDS

subscale, who was not able to distinguish between low vs. high fatigue (84.9 ( $SD = 19.4$ ) vs. 80.1 ( $SD = 20.4$ )).

## 4 | DISCUSSION

Confirmatory factor analyses revealed acceptable to good fit for both the four-factor and five-factor models with a slightly better fit for the five-factor model. Based on conceptual reasons, the five-factor model is the preferred model to use. In line with previous findings (Abma et al., 2018), it is therefore recommended to consider the work scheduling and output demand scales as two separate scales. Additionally, the five-factor model aligns with the original WRFQ structure (Amick et al., 2000). The finding that not all items met the factor loading criteria was subordinate in the current study, as item reduction was not the goal; however, this needs further research. Further research may address the distribution or answer the question whether items should be classified differently. The WRFQ was shown to be a reliable (good internal consistency) and valid (good discriminant validity) instrument to measure health-related work functioning in working cancer patients. The WRFQ total scale distinguished between cancer patients reporting good vs. poor health, low vs. high fatigue, no vs. clinical depression and low vs. high work-specific cognitive symptoms. Only the WDS subscale was not able to distinguish between low vs. high fatigue. The interpretability of the WRFQ is demonstrated in comparing differences between groups. Cancer patients with clinical depression or high work-specific cognitive symptoms have 21-point lower WRFQ scores, meaning that they are unable to meet the demands of the job due to their health an extra day/week or an extra 21% of their time compared to patients with no clinical depression or with low cognitive symptoms at work.

The mean score on the WRFQ 2.0 was 78.6, which means that working cancer patients experience difficulties in meeting the work demands for approximately 20% of the time or one day of a 5-day workweek on average. The difficulties in meeting the work demands can be due to fatigue, depressive symptoms and cognitive symptoms, as these factors are related to work functioning (Dorland et al., 2018). Cancer site and treatment might be less important for managing work functioning of cancer patients who are back at work (Dorland et al., 2017). Yet the level of work functioning is comparable to the level of work functioning of people in the general working population which is 84.2 (Abma et al., 2013). A side note here is that in the general working population, no one always functions properly 100% of the time, which means that there is noise (scores above 90/95 points). When comparing the level of work functioning of cancer patients to that of people after mental health problems, we see that cancer patients' level of work functioning is much higher compared to the level of work functioning after mental health problems (Arends et al., 2014).

There are few studies that use the WRFQ to measure work role functioning in different working populations with mixed clinical conditions or job types, such as workers with common mental disorders,

TABLE 2 Confirmatory Factor Analyses, four and five-factor model

WRFQ 2.0 Item	4 factor model				5 factor model				
	WSOD	PD	MSD	FD	WSD	OD	PD	MSD	FD
1. Work the required number of hours	<b>0.834</b>	0.175	-0.132	-0.270	<b>0.647</b>	0.128	0.217	0.078	-0.140
2. Get going easily at the beginning of the workday	<b>0.953</b>	0.164	-0.143	-0.301	<b>0.731</b>	0.111	0.224	0.042	-0.065
3. Start on your job as soon as you arrived at work	<b>0.651</b>	0.126	0.059	-0.146	<b>0.469</b>	0.177	0.134	0.223	-0.099
4. Do your work without stopping to take extra breaks or rests	<b>0.843</b>	-0.105	0.052	-0.078	<b>0.525</b>	0.247	-0.080	0.143	0.114
5. Stick to a routine or schedule	<b>0.917</b>	-0.189	0.138	-0.129	0.563	<b>0.067</b>	-0.091	0.118	0.371
6. Handle the workload	<b>0.959</b>	-0.179	0.054	-0.093	0.558	<b>0.108</b>	-0.063	-0.029	0.470
7. Work fast enough	<b>0.463</b>	0.008	0.308	0.199	0.150	<b>0.349</b>	-0.025	0.332	0.184
8. Finish work on time	<b>0.503</b>	0.085	0.017	0.367	0.060	<b>0.602</b>	0.044	0.039	0.191
9. Do your work without making mistakes	<b>0.657</b>	0.085	-0.296	0.537	0.095	<b>0.920</b>	-0.001	-0.059	-0.052
10. Satisfy the people who judge your work	<b>0.542</b>	0.074	-0.161	0.569	0.004	<b>0.926</b>	-0.045	0.055	-0.055
11. Feel a sense of accomplishment in your work	0.021	<b>0.666</b>	0.012	-0.165	0.132	-0.214	<b>0.695</b>	-0.069	0.087
12. Feel you have done what you are capable of doing	-0.001	<b>0.778</b>	0.072	-0.022	0.032	0.001	<b>0.773</b>	0.048	-0.006
13. Walk or move around different work locations (for example, go to meetings)	-0.087	<b>0.939</b>	0.158	-0.051	0.013	-0.082	<b>0.927</b>	0.126	-0.017
14. Lift, carry, or move objects at work weighing more than 10 pound	-0.003	<b>0.900</b>	-0.084	0.004	0.017	0.007	<b>0.908</b>	-0.197	0.109
15. Sit, stand, or stay in one position for longer than 15 minutes while working	0.132	<b>0.617</b>	0.066	0.018	0.076	0.141	<b>0.604</b>	0.115	-0.074
16. Repeat the same motions over and over again while working	0.068	0.074	<b>0.833</b>	0.066	0.061	-0.010	0.009	<b>0.892</b>	0.024
17. Bend, twist, or reach while working	0.124	0.062	<b>0.726</b>	0.182	0.003	0.136	-0.008	<b>0.755</b>	0.114
18. Use hand-held tools or equipment (for example, a phone, pen, keyboard, computer mouse, drill, hairdryer or sander)	0.028	0.047	<b>0.957</b>	-0.066	0.113	-0.068	-0.046	<b>1.070</b>	-0.108
19. Keep your mind on your work	-0.036	0.072	<b>0.941</b>	0.097	-0.004	-0.036	-0.006	<b>0.992</b>	0.017
20. Think clearly when working	0.028	0.080	<b>0.791</b>	0.184	-0.050	-0.012	0.044	<b>0.774</b>	0.222
21. Do work carefully	0.205	0.220	<b>0.357</b>	0.253	-0.018	0.261	0.189	<b>0.340</b>	0.196
22. Concentrate on your work	0.255	0.220	<b>0.134</b>	0.315	-0.049	0.394	0.196	<b>0.061</b>	0.258
23. Work without losing your train of thought	0.353	-0.057	0.302	<b>0.316</b>	0.006	0.147	0.015	0.044	<b>0.680</b>

(Continues)

TABLE 2 (Continued)

WRFQ 2.0	4 factor model			5 factor model					
24. Easily read or use your eyes when working	0.168	0.061	0.354	<b>0.333</b>	-0.093	0.125	0.104	0.100	<b>0.600</b>
25. Speak with people in-person, in meetings or on the phone	0.266	-0.042	0.392	<b>0.341</b>	-0.032	-0.012	0.057	0.083	<b>0.815</b>
26. Control your temper around people when working	0.155	-0.005	0.510	<b>0.367</b>	-0.131	0.013	0.063	0.63	<b>0.717</b>
27. Help other people to get work done	0.320	0.108	0.354	<b>0.259</b>	0.051	0.187	0.127	0.236	<b>0.421</b>

Abbreviations: WRFQ 2.0, Work Role Functioning Questionnaire 2.0; WSOD, Work scheduling and output demands; MSD, Mental and social demands; FD, Flexibility demands; WSD, Work scheduling demands; OD, Output demands; PD, Physical demands.

TABLE 3 WRFQ 2.0 description, 5-factor model

	Valid N (missing or 'not applicable')	Mean (SD)	Range (0-100)	N (%) at floor (0%)	N (%) at ceiling (100%)	Cronbach's $\alpha$
Work scheduling demands (WSD)	346 (6)	78.6 (6.0)	0.0-100.0	1 (0.3)	70 (19.9)	0.82
Output demands (OD)	340 (12)	76.2 (22.4)	0.0-100.0	1 (0.3)	69 (19.6)	0.88
Physical demands (PD)	237 (115)	83.4 (19.4)	15.0-100.0	0 (0)	79 (22.4)	0.82
Mental & Social demands (MSD)	350 (2)	77.4 (20.5)	3.6-100.0	0 (0)	64 (18.2)	0.93
Flexibility demands (FD)	339 (13)	80.0 (20.0)	0.0-100.0	1 (0.3)	77 (21.9)	0.87
Total score	352 (0)	78.6 (17.1)	10.2-100	0 (0.0)	15 (4.3)	0.96

Abbreviations: FD, Flexibility demands; MSD, Mental and social demands; OD, Output demands; PD, Physical demands; WRFQ 2.0, Work Role Functioning Questionnaire 2.0; WSD, Work scheduling demands.

workers in the general working population, occupational and insurance physicians, shift workers and workers at the university (Abma et al., 2018). Compared to those populations, working cancer patients had the lowest score on work role functioning, meaning that they had the most difficulties with meeting the demands of their job. Only one paper has considered the psychometric properties of the work limitations questionnaire (WLQ) in cancer patients (Tamminga et al., 2014). Sufficient reproducibility at the group level was found, but not at the individual level.

A study strength is the heterogeneous sample containing cancer patients with different cancer sites and treatments. A large part of the sample, however, was diagnosed with breast cancer. This might be a disadvantage for study generalisability and makes it difficult to examine the effect of cancer type on work functioning in more detail. Yet the sample reflects the population of working cancer patients in the Netherlands, as breast cancer is one of the most common cancers in individuals of working age (Roelen et al., 2011). For future research, studies with larger cancer patient samples are needed, including more cancer patients with diagnoses other than cancer. Besides this, it is not possible to state that the study sample is representative of all cancer patients who resumed work after cancer diagnosis and treatment, due to a lack of information about cancer patients who were not asked to participate or were asked but not willing to participate.

Cancer patients in the WOLICA cohort were mainly highly (39%) and medium educated (34%), and 17% was low educated. Moreover, cancer patients employed in manual work were underrepresented (12%). Therefore, the results might be difficult to generalise to working cancer patients with a lower educational level and workers in manual work. This has to be taken into account when interpreting the results on work functioning, because working in a manual job includes different tasks and job demands than working in a non-manual job.

It remains important to continue psychometric research on the WRFQ, particularly on its responsiveness. Little is known about the responsiveness of the WRFQ to health- or workplace-based changes. For use in clinical practice, it is also important to examine additional reliability measures, that is, the standard error of measurement (SEM), minimal important change (MIC) and intraclass correlation coefficients (ICCs). This requires additional research. Furthermore, it would be useful to know if the WRFQ early after return to work can predict future work functioning and sustained work participation in cancer patients.

In conclusion, with the growing success of cancer treatment in working cancer patients, understanding the impact of treatment and survivorship on work functioning is more crucial. The WRFQ 2.0 can be used by (occupational) healthcare professionals to better engage

TABLE 4 Comparing means ( $n = 352$ )

Variable	WRFQ total, M (SD)	WDS, M (SD)	OD, M (SD)	PD, M (SD)	MSD, M (SD)	FD, M (SD)
Self-rated health (SF-1)						
Excellent/very good/ good	80.3 (16.4)	80.5 (21.0)	78.3 (21.7)	85.3 (20.2)	78.6 (19.9)	81.7 (18.6)
Fair/poor	73.0 (18.7)**	71.3 (23.2)**	68.8 (23.7)**	78.7 (16.4)*	73.1 (22.3)*	75.2 (23.4)*
Fatigue (CIS)						
Low fatigue	82.0 (15.2)	82.5 (18.9)	79.8 (20.9)	84.9 (19.4)	81.5 (18.2)	83.7 (16.7)
High fatigue	72.2 (18.7)**	70.9 (24.6)**	23.6 (2.2)**	80.1 (20.4)	69.7 (22.2)**	73.4 (23.6)**
Depressive symptoms (PHQ-9)						
No depressive symptoms	80.4 (15.1)	80.5 (20.6)	78.6 (20.9)	85.0 (18.7)	79.8 (18.3)	82.2 (18.1)
Clinical depression	58.8 (20.7)**	59.2 (23.3)**	54.7 (24.2)**	69.3 (23.5)**	56.5 (26.0)**	61.8 (25.9)**
Work-specific cognitive symptoms (CSC-W DV)						
Low	86.1 (13.3)	83.3 (20.4)	84.3 (19.8)	85.8 (18.0)	87.6 (14.9)	88.8 (14.1)
High	64.7 (17.6)**	67.2 (22.4)**	62.4 (22.8)**	77.4 (22.2)**	59.5 (20.6)**	64.3 (21.3)**

Abbreviations: CIS, Checklist Individual Strengths; CSC-W DV, Cognitive Symptom Checklist-Work, Dutch Version; PHQ-9, Patient Health Questionnaire-9; SF-1, Short-Form 36; WRFQ 2.0, Work Role Functioning Questionnaire.

\* $p < 0.05$ .

\*\* $p < 0.01$ .

their patients in shared decision-making when back at work after cancer diagnosis.

## 5 | DATA AVAILABILITY.

Data available on request from the authors.

### ACKNOWLEDGEMENTS

The authors thank Ans Smink, who had a crucial role in the data collection.

### CONFLICT OF INTEREST

The authors declare that they have no conflict of interest. Informed consent was obtained from all individual participants included in the study. All procedures in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. All procedures were reviewed and approved by the Medical Ethical Committee of the University Medical Center Groningen (M12.125242).

### AUTHOR CONTRIBUTION

H.F. Dorland (HD); F.I. Abma (FA); C.A.M. Roelen (CR); U. Bültmann (UB); B.C. Amick III (BA). All authors were involved in study conception and design. Analyses were conducted by HD and FA, while interpretation of data and drafting and revising the manuscript were

conducted by all authors. All authors read and approved the final manuscript.

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**How to cite this article:** Dorland HF, Abma FI, Roelen CA, Bültmann U, Amick BC. Validation of the Work Role Functioning Questionnaire 2.0 in cancer patients. *Eur J Cancer Care*. 2021;00:e13420. <https://doi.org/10.1111/ecc.13420>