



# Adaptation of the Core Set for Vocational Rehabilitation for Cancer Survivors: A Qualitative Consensus-Based Study

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## Abstract

**Purpose** The Core Set for Vocational Rehabilitation (CS-VR) of the International Classification of Functioning, Disability and Health (ICF) describes the work functioning of individuals in need of VR. We aimed to adapt the CS-VR from the perspective of cancer survivors (CSs) and stakeholders, developing a CS-VR-Onco.

**Methods** We held five focus groups with 17 CSs who were employed at the time of diagnosis, to discuss their work reintegration experiences. After analyzing the focus group conversations, the CS-VR-Onco was developed. During a group interview, eleven stakeholders explored barriers/facilitations in assessing the work functioning of CSs by using the CS-VR-Onco. We applied the framework method and thematic analysis.

**Results** For the focus groups, the CS-VR-Onco of 85 categories emerged, and the ICF chapters of Mental functions, Exercise and tolerance functions, Interpersonal interactions and relationships, Major life areas, General tasks and demands, Mobility, Support and relationships, and Attitudes were prioritized. For the group interview, stakeholders' perspectives can be synthesized into two themes: close to the lived experience and usability criteria. Stakeholders confirmed the categories of the CS-VR-Onco, a checklist that should be used through an integrated approach across multiple disciplines.

**Conclusions** The adapted CS-VR-Onco reflects the CSs' lived experiences of work reintegration and the factors that have influenced this process. The CS-VR-Onco was described as complete and usable through an integrated approach.

**Keywords** International Classification of Functioning Disability and Health · Return to work · Occupational therapy · Cancer survivors · Vocational rehabilitation

## Abbreviations

RTW Return to work  
CSs Cancer survivors  
ICF International Classification of Functioning Disability and Health

CS-VR Core Set for Vocational Rehabilitation  
VR Vocational rehabilitation

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## Introduction

Participation in everyday life is the ultimate goal of rehabilitation, with returning to work (RTW) being a key element [1, 2]. Work participation improves cancer survivors' (CSs) quality of life [3], helping them to deal with the disease and regain a sense of normalcy [4]. RTW is an emerging health issue due to increased cancer incidence, survival rate, and high prevalence [5]. In 2020, there were 19.3 million new cancer diagnoses and over 50 million cases of 5-year prevalence worldwide [6]. More than 1/3 of cases occur in individuals of working age (20–59 years) [7] who need to go back to work during or after their cancer treatment. However, some difficulties related to mental and physical fatigue, carrying out work tasks, and psychological issues may hinder workplace reintegration [8, 9]. This scenario requires prompt detection of work-related difficulties to prevent work loss over time since it is likely to be 1.4 times higher for CSs than for healthy individuals [10, 11].

Vocational rehabilitation (VR) refers to a multiprofessional, evidence-based approach that is provided in different settings, services, and activities to working-age individuals with health-related impairments, limitations, or restrictions in work functioning, and whose primary aim is to optimize work participation [12]. VR applies broadly to individuals with various pathologies (i.e., multiple sclerosis, severe mental illness, etc.) [13] and seems to facilitate RTW over usual care [14]. Although the feasibility of VR has been demonstrated in a sample of women with breast cancer [15, 16], it requires careful evaluation of potential candidates to maximize benefits and allocate resources correctly [17].

The International Classification of Functioning, Disability, and Health (ICF) states that the potential of individuals with work-related difficulties to return to work depends on the disease itself, health planning capabilities, and social reintegration policies [1]. The ICF's unified conceptual framework makes it a suitable tool to describe the individual's health status and work functioning, as there is interaction between the ICF components of Body Functions, Body Structures, Activity and Participation, and Environmental factors. The Core Set for Vocational Rehabilitation (CS-VR) consists of an ICF-based list of categories relevant to comprehensively assess and describe the work functioning of individuals in need of VR [18]. The CS-VR comprises 90 categories covering all ICF components, except for Body Structure. The CS-VR was developed through a multistep research process that involved patients with chronic conditions other than cancer [19, 20]. This core set guides the multidisciplinary assessment of individuals and the planning of appropriate

VR interventions, but to date, it has been tested only in individuals with spinal cord injury and musculoskeletal diseases [21–23]. Since the factors influencing work reintegration depend on the type of disease [24] and on the stages of the RTW process [25], the original CS-VR might not be sufficiently comprehensive in all key aspects to describe the work functioning of CSs and, as a consequence, to plan tailored VR interventions. Thus, verifying the appropriateness of CS-VR in a population of CSs seems like a step forward.

This study aims to adapt the CS-VR for CSs by (1) listening to CSs' needs and priorities in the RTW process; and (2) listening to stakeholders' perspectives concerning the assessment of work functioning and the usability of the checklist.

## Methods

### Study Design and Procedures

We conducted a qualitative consensus-based study from October 2020 to June 2021 through focus groups and a group interview, as part of a sequential mixed-methods design.

Based on the factors influencing CSs' ability to return to work and the original CS-VR [9, 26, 27], we selected meaningful ICF chapters to address this topic. This resulted in the provisional Core Set, an initial list of ICF first-level chapters discussed during the focus groups with the CSs (Supplementary information-SI1). After analyzing the focus group conversations, the CS-VR-Onco was developed. Then, we invited local stakeholders to participate in a group interview to integrate the preliminary findings and to explore barriers/facilitations in assessing the work functioning of this population by using the CS-VR-Onco. We followed the COREQ checklist for data reporting (SI2).

### Study Participants

For the focus groups, CSs were recruited from the Cancer Registry of the province of Reggio Emilia. We also consulted the participant database of the UNAMANO project, which is a local social-healthcare pathway conceived to support CSs in the RTW process through the provision of VR. The UNAMANO characteristics were described in a recent article [28].

Eligible participants were between 20 to 60 years old at the time of their cancer diagnosis. Additionally, the eligibility of CSs recruited from the Cancer Registry was further restricted to patients with infiltrating malignant tumors diagnosed in 2017 and those who had already returned to work. We excluded individuals with nonmelanoma skin cancer, as well as those not able to communicate fluently in Italian.

For the group interview, we used convenience sampling by inviting healthcare professionals working within the settings of VR for CSs and non-healthcare professionals (e.g., trade unionists, human resources managers, etc.) who had provided support during the RTW process for at least one CS.

## Recruitment of Participants

From the Cancer Registry, sixty-eight eligible CSs were contacted via letter and telephone to verify their occupational status at diagnosis. If employed, the author SP invited them to participate. From the UNAMANO project, two eligible CSs were contacted via telephone.

Twenty-one stakeholders with different roles and disciplinary backgrounds were contacted via email.

According to the participants' preferences, the focus groups and the group interview were scheduled in person or remotely. All participants received an information sheet, and informed consent was obtained prior to data collection.

## Data Collection

Before the focus groups, participants were asked to rate the importance of the ICF first-level chapters included in the provisional Core Set with respect to their RTW experience using a 5-point Likert scale, and then to explain their assessment during the focus groups. Before the group interview, the stakeholders were sent the CS-VR-Onco that emerged during the focus groups with CSs to gain confidence with the checklist. Meetings were held in a room located at the Local Health Authority of Reggio Emilia or remotely. All content was shown in a PowerPoint presentation. During the focus groups and the group interview, we followed a moderation scheme, which is described in Table 1.

Moderation was overseen alternatively by SP, who works as an occupational therapist, and LG, a qualitative methodologist. The observers were a physiotherapist and methodologist (SC), an occupational therapist (MP), and a nurse with expertise in qualitative research (MEDC). Both the focus groups and the group interview were audio-recorded,

transcribed verbatim, and anonymized. The transcripts were not returned to the participants for comments or corrections.

## Data Analyses

Sociodemographic data and work-related and disease-related factors were analyzed using descriptive statistics.

For focus groups, the importance score, assigned to ICF first-level chapters of the provisional Core Set, was summarized as “not important” (score 1 or 2), “quite important” (score 3), and “very important” (score 4 or 5). For each chapter, the number of participants who assigned the same score was counted, and then the total number was converted into a percentage. The focus groups were transcribed verbatim and analyzed using a deductive framework [29] based on the ICF (the provisional Core Set and the original CS-VR). This process was carried out by two researchers (SP, MP) independently, and discrepancies were solved with help from a third researcher (SC). All transcripts were extensively read and subsequently divided into conversation turns. We highlighted the meaningful units of the text, which we then assigned to the predefined categories of the framework. More than one concept could emerge from a single significant unit, which is a sentence or a series of sentences that convey(s) meaningful content [30]. Finally, by applying specific linking rules [31], each concept was associated with one or more ICF categories. An example of linking is outlined in Table 2, while the entire framework is presented in SI3. The emerging framework enabled us to understand which ICF categories were recurrent and prioritized by the CSs. We made the final analysis upon data triangulation, which combined the assessment of the provisional Core Set by CSs and framework analysis of the focus groups. The focus group framework analysis was applied to each transcript before proceeding to the next focus group. Thus, data saturation (i.e., redundancy of themes while applying the framework) was reached.

For the group interview, the meeting was transcribed verbatim by SP and analyzed through thematic analysis [32]. First, familiarization was performed by two authors independently (SP and LG). Codes were generated and then examined to identify patterns of meanings. Thus, codes and

**Table 1** The moderation scheme that was followed during the focus groups and the group interview

(After having provided information regarding the meetings and having collected consent, sociodemographic and work-related data): participants' first round of presentations
Introduction of the key concepts and the glossary of the ICF by the moderator
Open-ended questions based on the ICF components to learn more about RTW experiences (CSs only)
Explanation of the assessment of the ICF first-level chapters of the provisional Core Set (CSs only)
Open-ended questions based on the CS-VR-Onco (stakeholders only)
Discussion concerning meaningful contents that were not talked about during the focus groups or the group interview
Summary of the relevant contents that emerged during the focus groups or the group interview

ICF International Classification of Functioning, RTW return to work, CSs cancer survivors, CS-VR-Onco Core Set for Vocational Rehabilitation

**Table 2** Examples of the concepts that emerged during the focus groups that have been linked to the ICF categories

Participant	Meaningful unit	Concepts	Linking to the ICF categories
Female, 52 years old, worker (1st focus group)	“Like everyone, already in the first step, <i>I had problems with concentration. I forgot things, in fact, talking to the occupational therapist and the psychologist, they told me for example to use the post-it notes, in fact I have always written everything on the calendar.</i> ”	Problems due to attention	b140 Attention functions
		Problems due to memory	b144. Memory functions
		Support of healthcare professionals	e355 Health professionals
		Strategies to overcome difficulties	d175 Solving problems
Male, 62 years old, veterinarian (3rd focus group)	“In a working Day I have 10 h in the office and 2 h in the car. Therefore, some a busy day. Above all, I realized that <i>I could not stay an hour in the car due to incontinence problems.</i> ”	To drive as long as necessary	d475 Driving
		Problems due to incontinence	b620 Urination functions

initial themes were discussed by the research group to obtain consensus. Finally, themes were described determining their story and named, as reported in SI3.

### Reflexivity and Rigor

The focus group facilitators are researchers trained in qualitative methods and rehabilitation professionals who apply the ICF. To ensure trustworthiness [33], a qualitative perspective on methodological rigor, the team received training for all the research steps.

Any possible interpretive bias was limited by involving at least two researchers in each step of data collection and analysis. The interdisciplinary nature of the research team allowed for challenging and corroborating the data and analytic processes. None of the authors had a prior relationship with the CSs involved in this research, except for two of them, who were followed by the author SP for a VR intervention that ended one year prior to the beginning of the study. All participants received the same information sheet.

## Results

### Participants' Characteristics

For the focus groups, 53 potential participants were excluded because they did not consent to take part, did not answer the telephone, were unemployed at diagnosis, did not return to work, had passed away, or did not show up to the appointment. The final sample consisted of 17 participants whose characteristics are reported in Table 3. The CSs had a mean age of 48.8 years, 53% were female, and almost all had a medium/high education level. Hematological malignancies and breast cancer were the most represented diagnoses. Most participants were employed in private companies with permanent, full-time work contracts. A psychologically demanding workload was reported by 76.5% of participants. RTW took place before the beginning of the study for all participants who participated in the focus groups.

Five focus groups were scheduled, three were held in person, and two were held remotely. Their average duration was 2 h and 6 min (min. 1:42–max. 2:47). Data saturation was reached after four focus groups. The last one confirmed the ICF categories of Body Functions and Environmental Factors, while for Activity and Participation, one more category was identified (d350 Conversation).

For the group interview, 10 potential participants were excluded because they did not answer the e-mail or were not eligible. Eleven stakeholders with different areas of expertise participated: healthcare professionals (an occupational therapist, a physiotherapist, a psychiatrist, an occupational physician, a nurse, an information specialist, and a psychologist) and non-healthcare professionals (a trade unionist, and human resources managers of private and public companies). The group interview was scheduled remotely.

### The CS-VR for Cancer Survivors

Figure 1 describes the assessment of the importance of each ICF first-level chapter, assessed before the focus groups and prioritized during the focus groups by the participants. Two of them did not assess the provisional Core Set.

Among all five focus groups we identified 816 concepts, of which 27.2% were related to the Body Functions component, 36.3% to Activity and Participation, and 36.5% to Environmental factors. These concepts were associated with 85 ICF categories: 26 of Body functions, 33 of Activity and Participation, and 26 of Environmental factors. Overall, 79 are second-level, and 3 are both third and fourth level categories.

Compared to the original CS-VR, 58 categories were confirmed, while 27 new categories emerged. The latter mainly concerns Body Functions; for example, b670 Sensation associated with genital and reproductive functions, or b5350 Sensation of nausea. Regarding Activity and Participation and Environmental factors, the new categories belong to the chapters of Mobility, Self-care and Domestic life, Interpersonal interactions and relationships, Community, social and civic life, Support and relationships and

**Table 3** Characteristics of the CSs' participants to the focus groups

	Focus groups	N
Number of participants	1st/2nd/3rd/4th/5th	5/4/3/3/2
<i>Sociodemographic data</i>		
Sex	Male/female	8/9
Mean age ( $\pm$ SD)		48.8 (10.9)
Marital status	Married/single/cohabitant/divorced	11/4/1/1
Children	0/ $\geq$ 1	5/11
Education level	Low/medium/high	2/9/5
<i>Work-related factors</i>		
Type of employment	Employee/self-employed	13/4
Type of company	Public sector/private	2/15
Type of contract	Permanent contract/freelance Professional	13/4
Work schedule	Full-time/part-time	14/3
Shift worker	No/yes	15/2
Work at night (evening and night)	No/yes	16/1
Psychologically demanding job	No/sometimes/yes	3/3/10
Physically demanding job	No/sometimes/yes	10/1/5
<i>Disease-related factors</i>		
Type of cancer	Hematologic malignancies	7
	Breast	4
	Prostate	1
	Bladder	1
	Colon	1
	Central nervous system	1
	Genital organs (male and female)	2

One participant did not answer the questions concerning Children, Education level, Psychologically or Physically demanding job

Attitudes. Table 4 reports the adapted CS-VR-Onco, with new categories reported in italics.

### Body Functions

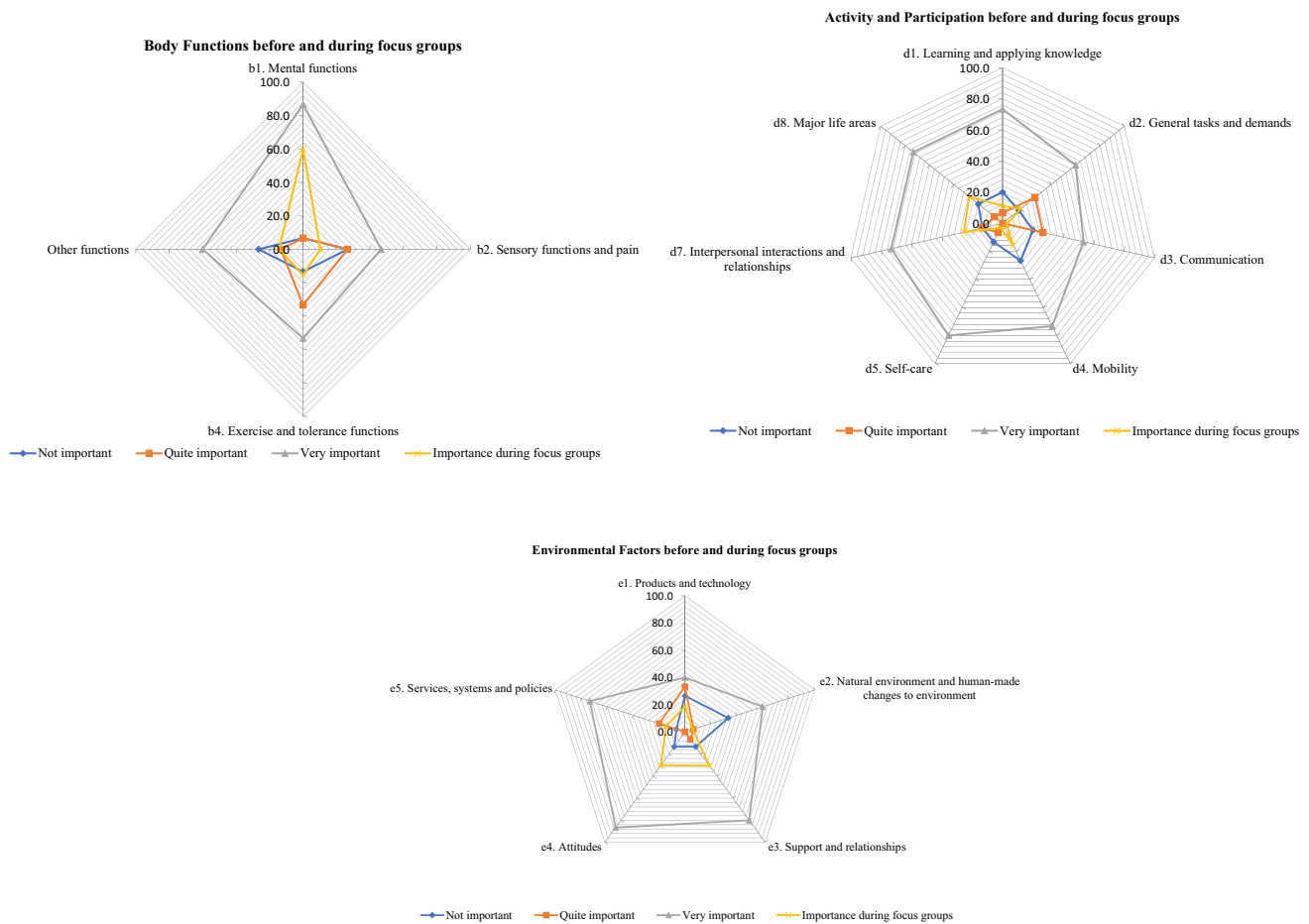
Data collected before the focus groups indicated that b1 Mental functions were very important for RTW as stated by 13 CSs. Similarly, Other functions, and b4 Exercise and tolerance functions were considered relevant by 9 CSs and 8 CSs, respectively. Both Other functions and b2 Sensory functions and pain were judged not important for RTW by 4 participants.

Data collected during the focus groups indicated that 59.9% of the concepts related to Body functions were associated to the ICF categories belonging to b1 Mental functions chapter, while 15.3% were associated to b4 Exercise and tolerance functions of which 14.2% to the category b455 Exercise tolerance functions. Regarding chapters b2 and Other functions, the most recurrent categories were b280 Sensation of pain, b730 Muscle power functions, and b670 Sensations associated with genital and reproductive functions.

### Activity and Participation

Data collected before the focus groups indicated that d1 Learning and applying knowledge, d4 Mobility, d5 Self-care, d7 Interpersonal interactions and relationships, and d8 Major life areas were very important for RTW, as stated by more than 11 CSs, while d4 Mobility seemed of lesser importance, as reported by 4 CSs.

Data collected during the focus groups indicated that more than 52.8% of the concepts related to Activity and Participation were associated with the ICF categories d7 Interpersonal interactions and relationships, of which 13.1% were associated with the category d740 Formal relationships and d8 Major life areas. More than 30% of concepts were associated with d2 General tasks and demands and d4 Mobility. The most cited categories were d210 and d220 Undertaking single and multiple tasks, d240 Handling stress and other psychological demands, d475 Driving, d415 Maintaining a body position, d445 Hand and arm use, d450 Walking, and d430 Lifting and carrying objects. Regarding d1 Learning and applying knowledge, category d175 Solving problems was cited 6.1% of the time.



**Fig. 1** The assessment of importance of the ICF's (International Classification of Functioning, Disability, and Health) first-level chapters of the Body Functions, Activity and Participation, and Environmental factors, assessed before the focus groups (not, quite, and very important through the provisional Core Set) and prioritized during the focus groups by the cancer survivors (CSs). The figure represents the final analysis of the data that combined the assessment of the provisional Core Set by the CSs and the analysis of the focus group framework.

## Environmental Factors

Data collected before the focus groups indicated that e3 Support and relationships, e4 Attitudes, and e5 Services, systems and policies were very important, as reported by 12, 13 and 11 of CSs, respectively. Chapter e2 Natural environment and human-made changes to the environment seemed of lesser importance, as stated by 5 participants.

Data collected during the focus groups indicated that 60.7% of the concepts related to Environmental factors were associated to the ICF categories of e3 Support and relationships and e4 Attitudes. Particularly, e325 Acquaintances, peers, colleagues, neighbors and community members, e330 People in positions of authority, and the respective categories for Individual attitudes (e425, e430) seemed relevant for work reintegration. Finally, 18.8% of the concepts were

A comparison was made to describe any changes of judgement before the focus groups and after the focus groups. The interpretation of the data is qualitative: changes in importance pre- and after focus groups can be appreciated by comparing the grey line (very important through judgements before focus groups) and yellow line (the importance attributed by CSs during focus groups). Fifteen CSs assessed the provisional Core Set

associated to e1 Products and technology, of which 10% to e1101 Drugs, and 4.2% to e135 Products and technology for employment.

## Stakeholders' Perspectives

From the group interview, two themes embracing the assessment of work functioning through the CS-VR-Onco were generated: *close to the lived experience* and *usability criteria*.

### Theme 1: Close to the Lived Experience

Stakeholders confirmed the categories of the CS-VR-Onco, agreeing on the precision and richness of the checklist, that

**Table 4** The adapted CS-VR-Onco

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Body functions

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**b1. Mental functions**

- b126. Temperament and personality functions
- b130. Energy and drive functions
- b134. Sleep functions
- b140. Attention functions
- b144. Memory functions
- b152. Emotional functions
- b160. Thought functions
- b164. Higher-level cognitive functions

*b1801. Body image*

**b2. Sensory function and pain**

- b210. Seeing functions
- b230. Hearing functions
- b235. Vestibular functions
- b280. Sensation of pain
- b28010. Pain in head and neck*
- b28015. Pain in lower limb*

**b4. Exercise and tolerance functions**

- b435. Immunological system functions*
- b455. Exercise tolerance functions

**Other functions**

- b5106. Functions of expelling the contents of the stomach, oesophagus or pharynx*
- b525. Defecation functions*
- b5350. Sensation of nausea*
- b620. Urination functions*
- b670. Sensations associated with genital and reproductive functions*
- b730. Muscle power functions
- b760. Control of voluntary movement functions*
- b830. Other functions of the skin*
- b850. Functions of hair*

**Activity and participation**

**d1. Learning and applying knowledge**

- d155. Acquiring skills
- d160. Focusing attention
- d166. Reading
- d170. Writing
- d175. Solving problems

**d2. General tasks and demands**

- d210. Undertaking a single task
- d220. Undertaking multiple tasks
- d230. Carrying out daily routine
- d240. Handling stress and other psychological demands

**d3. Communication**

- d350. Conversation
- d360. Using communication devices and techniques

**d4. Mobility**

- d410. Changing basic body position
-

**Table 4** (continued)

## Body functions

d415. Maintaining a body position

d430. Lifting and carrying objects

*d435. Moving objects with lower extremities*

d440. Fine hand use

d445. Hand and arm use

d450. Walking

*d460. Moving around in different locations*

d470. Using transportation

d475. Driving

**d5. Self-care and Domestic life***d510. Washing oneself*

d540. Dressing

*d630. Preparing meals**d660. Assisting others***d7. Interpersonal interactions and relationships**

d720. Complex interpersonal interactions

*d730. Relating with strangers*

d740. Formal relationships

*d750. Informal social relationships**d760. Family relationships***d8. Major life areas**

d850. Remunerative employment

d870. Economic self-sufficiency

**d9. Community, social and civic life***d920. Recreation and leisure***Environmental factors****e1. Products and technology**

e1101. Drugs

e115. Products and technology for personal use in daily living

e135. Products and technology for employment

e155. Design, construction and building products and technology of buildings for private use

**e2. Natural environment and human-made changes to environment**

e225. Climate

e240. Light

e250. Sound

e260. Air quality

**e3. Support and relationships**

e310. Immediate family

e320. Friends

e325. Acquaintances, peers, colleagues, neighbours and community members

e330. People in positions of authority

*e335. People in subordinate positions**e345. Strangers*

e355. Health professionals

e360 Other professionals

**e4. Attitudes***e410. Individual attitudes of immediate family members*



**Table 4** (continued)

## Body functions

*e420. Individual attitudes of friends**e425. Individual attitudes of acquaintances, peers, colleagues, neighbors and community members**e430. Individual attitudes of people in positions of authority**e445. Individual attitudes of strangers**e450. Individual attitudes of health professionals**e460. Societal attitudes***e5. Services, systems and policies***e570. Social security services, systems and policies**e580. Health services, systems and policies**e590. Labour and employment services, systems and policies*

In italic are reported the 27 new ICF categories

was very close to their professional experience and that of the patients/employees with whom they had worked. All the aspects that should be considered for the assessment of work functioning of CSs were described in the CS-VR-Onco. Three stakeholders stated:

“Everything that could actually facilitate or limit a cancer survivor in his or her return to work has been identified.” (*occupational therapist*).

“It is a beautiful and important checklist. In my opinion there are many categories for which I said “oh this yes, this too, this...”. So, I tell you that in my opinion it is a great tool.” (*physiotherapist*).

“I believe that the CS-VR-Onco is quite comprehensive regarding the possible dimensions that describe the return to work. No other category comes to mind; it is very complete.” (*psychologist*).

**Theme 2: Usability Criteria**

Stakeholders confirmed that the CS-VR-Onco should be used by a healthcare professional in coordinating VR interventions through an integrated approach across multiple disciplines. In this way, the checklist could favor interactions within the social-healthcare team and between the team and the company. This theme is illustrated in the following sentences:

“The tool should be coordinated by a professional, because if all professionals have to follow the entire categories, well, let us say that it would become a little bit difficult.” (*occupational physician*).

“I would feel like working on autonomy and strategies that do not regard the psychological area, because other colleagues have more experience with this. Additionally, with regard to other symptoms (i.e., nausea), the approach must be integrated with the oncologist or hematologist.” (*physiatrist*).

“This checklist could accompany the occupational physician to reflect widely and therefore to facilitate the employee through the accommodations to be provided by the company.” (*human resources manager*).

**Discussion**

From this qualitative consensus-based study, we generated the first CS-VR-Onco, a checklist made up of 85 ICF categories that, altogether, comprehensively assess and describe the work functioning of CSs employed at diagnosis. Thirty-three categories cover the component Activity and Participation, while 26 categories concern both Body functions and Environmental factors. With respect to the original CR-VR, 27 new categories emerged that primarily concern the Body functions component.

The CS-VR-Onco reflects the voices of CSs who have had work reintegration experiences during and after cancer treatment, describing this process thoroughly from an ICF perspective. Particularly, the categories of Mental functions, Exercise and tolerance functions, Interpersonal interactions and relationships, Major life areas, General tasks and demands, Mobility, Support and relationships, and Attitudes were prioritized. Furthermore, the checklist is close to the practice of healthcare and non-healthcare professionals who have followed the RTW process of CSs. The completeness and usability of the CS-VR-Onco through an integrated approach across disciplines has been underlined.

Regarding Body Functions, global and specific mental functions emerged as priorities from CSs who participated in the focus groups. Cognitive impairments, which encompass problems related to memory, attention, and executive dysfunction, are frequently reported by CSs [34, 35], as well as reduced sleep quality [25]. Work-related psychological aspects were also discussed: even though cancer experiences

can lead to a change in priorities, a positive temperament helps the individual to react and return to a normal life, of which employment is a notable part [36]. Some concerns tied to the perceived decline of work ability, the fear of job loss and disclosure of one's disease in the workplace, and general anxiety linked to one's cancer experience may arise [4, 37]. In addition, multimodal treatments can influence the physical and social functioning of CSs, leading to several side effects; fatigue, pain, dyspnea, and lymphedema are frequent [38, 39]. In this study, 14.2% of concepts that emerged were associated with Exercise and tolerance functions, an umbrella for the description of symptom fatigue. Even though fatigue seems to decrease over time from the point of diagnosis, this debilitating symptom remains associated with negative work outcomes [37], as also reported by one-third of the local CSs interviewed in 2017 [9]. New categories specific for CS conditions that are not reported in the original CS-VR were found. Although RTW has occurred, the drug induction of menopause or chemotherapy leads to unpleasant sensations, such as hot flushes, sweats, and nausea [39]; these symptoms are unpredictable and could thus occur during a work meeting or can interrupt sleep. Finally, RTW may pose a challenge for those who perceive a deterioration in their body image or who experience hair loss [38].

A substantial number of the CS-VR-Onco categories were associated with the Activity and Participation component. First, the importance of Interpersonal interactions and relationships and Major life areas were emphasized by participants. A fostering aspect of relationships is to maintain positive communication between employees and employers during sick leave [40]. The parties might not know how to interact; for example, the patient may fear disclosing the diagnosis [41], thinking about the potential work-related consequences, and the employer might not ask to respect the employee's privacy [42]. Moreover, CSs may have changed their priorities in life, and some relationships may no longer be as relevant while respecting the formal interactions dictated by the workplace. Although remunerative employment (Major life areas) is a steppingstone to return to a normal life, balancing one's daily routine, work tasks, and the side effects of treatment may be challenging [43]. This scenario could also affect the time of RTW. Self-employed individuals do not earn an income during prolonged sick leave [44]. Also, depending on the type of employment, which can be physically and/or psychologically demanding, difficulties may occur in undertaking work tasks. Although the importance assigned to General tasks and demands and Mobility was variable before the focus groups, several concepts related to these categories were discussed during the focus groups and reported by other studies: lifting objects above one's head and carrying heavy objects have influenced the RTW of females with breast cancer after surgery [45], and the execution of work activities can be limited in the case of

prolonged postures (i.e., sitting) or excessive walking [4]. Additionally, work characteristics that depict more psychological work, such as roles of responsibility and management, multitasking, or driving for a long commute, can also become stressful to sustain [35]. In these situations, CSs might identify personal strategies for solving problems at work: setting achievable goals and being gradual, as well as using helpful strategies (i.e., post-it notes, keeping a diary) [4]. New categories related to the Mobility, Self-care and Domestic life, Interpersonal interactions and relationships, Community, social and civic life were found. These categories can be specific to the type of oncological disease but also vary based on the individual. For example, for one CS (1st focus group), leisure time is required after a workday because of excessive fatigability. Therefore, it seems necessary to find a balance between one's present energy, residual abilities, formal and informal relationships, and all significant activities to be restored.

Among the Environmental Factors, emotional and concrete support from one's employer and colleagues, as well as one's attitudes, were reported as pivotal characteristics of work reintegration, as also stated by Greidanus et al. [40]. While concrete support can be linked to the provision of reasonable accommodations, emotional support, as well as attitudes, depend more on the willingness to take an interest in a colleague who has experienced the disease. Based on Italian laws, services and policies, practical support can be offered, such as the possibility to switch to a reversible part-time contract, to reduce working hours, or to work from home [46]. The latter could be a solution for office workers who must be absent from work for a long time or who cannot physically reach the workplace. In this case, some products and technologies for smart working should be provided. Generally, a plan of communication for updating and organizing the RTW and the negotiation of the types of accommodations are considered good practice [47]. As stated earlier, the side effects of treatment, albeit curative, can impact on a person's work functioning and increase the risk of unemployment [26]. In these cases, the characteristics of the workplace could hinder a person's work functioning; for example, an office shared with many colleagues may not be of help for the worker who has problems focusing. Few concepts were associated with the chapter Natural environment and human-made changes to the environment. New categories were associated with the support and attitudes of family, friends, and colleagues, a group of individuals who should motivate the person and provide much needed support in the RTW phase [48], the denial of which could affect the general well-being and work functioning of CSs.

Since the CS-VR-Onco was considered complete, rich, and able to reflect the dimensions of the CSs' experiences of RTW, we confirmed the categories emerged during the

focus groups. Moreover, the usability CS-VR-Onco has also been expressed with two key suggestions: (1) to identify a professional who should coordinate the evaluation and intervention of VR; and (2) to use an integrated approach across disciplines to address the heterogeneous needs of this population. Although multidisciplinary interventions were proven to favor work reintegration compared to usual care [15], the role of coordination was assigned to different professionals covering both healthcare and social profiles; that is, nurses, psychologists, social workers, occupational physicians, and occupational therapists [28, 49]. Therefore, this characteristic is dictated by the resources available in the contexts and institutions that provide VR. However, given that CS-VR-Onco is based on the ICF, which has a universal framework, it could favor communication between clinicians of different disciplines and contexts and with the company to agree on the type of RTW intervention and accommodations to implement.

### Strengths and Limitations of the Study

This study is the first aimed at adapting the CS-VR for a population of CSs employed at the time of diagnosis. To reach our aim, a qualitative consensus-based study was carried out to include the perspectives of both CSs and stakeholders. The focus groups allowed the participants to compare their experiences to reflect on new aspects that had not been considered earlier. Thus, an agreement was reached, and some categories of the ICF have been highlighted, whose relevance seems to change slightly during the focus groups (i.e., Mobility chapter), thus indicating the importance of the methodologies selected to generate relevant concepts. Furthermore, stakeholders commented on the checklist, observing it from different points of view and backgrounds. Thanks to the unified conceptual framework based on the ICF, the CS-VR-Onco can be used across different disciplines and contexts.

Due to the health emergency dictated by COVID-19, the number of participants invited for each focus group was reduced to guarantee their safety and ensure social distancing. Moreover, since three meetings were held remotely, the link between participants may not have been created equally across meetings.

Finally, saturation was reached after the fourth focus group for the components of Body Functions and Environmental factors, except for Activity and Participation (d350 Conversation). This could indicate that some categories and activity limitations are related to specific situations that depend on the kind of job, the characteristics of the work tasks, and the type of treatment. In fact, the CS who talked about limitations in conversation continued to work from home and had undergone both surgery and chemotherapy. Chemotherapy is considered among the main risk factors for

work difficulties and job loss [26]. However, d350 Conversation was also confirmed by the stakeholders.

### Conclusions

This study contributes to the adaptation of the first CS-VR for CSs employed at the time of diagnosis, reflecting their lived experiences of work reintegration and the factors that have influenced this major process. Moreover, local stakeholders involved in the VR of this population have deemed the checklist to be complete and usable through an integrated approach across disciplines.

The new CS-VR-Onco allows professionals to comprehensively assess the needs and work difficulties of CSs who want RTW, adopting a patient-centered perspective. Thus, CSs' needs detected through the CS-VR-Onco could be addressed by tailoring the intervention and involvement of healthcare and non-healthcare professionals based on their area of expertise. A correct definition of CSs' needs, and the involvement of appropriate professionals may optimize the use of resources allocated for VR interventions.

We recommend that future research aim to validate the CS-VR-Onco in a larger sample of CSs to define a minimum standard of work functioning areas to assess in CSs. Once the CS-VR-Onco is validated, healthcare professionals involved in VR settings will be able to adopt the checklist into their routine, both for clinical and research purposes.

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**Data Availability** The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

### Declarations

**Conflict of interest** The authors have no relevant financial or non-financial interests to disclose.

**Ethics Approval** The mixed-method study was approved by the Ethics Committee of the province of Reggio Emilia (protocol 2020/0063350) and prospectively registered at Clinical Trial.gov (NCT04439461). The

study was conducted according to the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

**Consent to Participate** Informed consent was obtained from all individual participants included in the study.

**Consent to Publish** Consent for publication was obtained from all individual participants included in the study.

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