



ORIGINAL ARTICLE

# The Dutch Recovering Quality of Life questionnaire (ReQoL) and its psychometric qualities



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## Abstract

**Background and objectives:** The emergence of the recovery movement has led to the development of the Recovering Quality of Life Questionnaire (ReQoL) in the UK. This study aims to describe and evaluate the Dutch translation.

**Methods:** The ReQoL was administered in two samples: 62 students completed the ReQoL-20, MANSAs, EQ-5D-5L, PHQ-9 and GAD-7 through an online survey link. The ReQoL was tested for reliability and a first impression was obtained of convergent and known group validity. In addition, 164 patients with a psychotic disorder that were part of the UP'S cohort study completed the ReQoL-10, PHQ9 and GAD-7.

**Results:** The ReQoL-10 and ReQoL-20 showed to be reliable in the student sample and the patient sample. Indices of the convergent and known-group validity showed that the ReQoL was predominantly associated with quality of life and was able to distinguish between scores of patient and student samples.

**Conclusion:** The Dutch translation of the ReQoL-10 and ReQoL-20 yielded results in line with those of the original English version.

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## Background

In mental health care for patients with severe mental disorders, there has been a shift of attention from clinical

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outcomes and symptom reduction to quality of life and functional outcomes.<sup>1,2</sup> Many researchers and clinicians have argued that outcome measurement of mental health care (MHC) should have a broader focus than merely assessing the severity of symptomatology of psychiatric disorders.<sup>3,4</sup> The emergence of the recovery movement led to an increased attention for the assessment of (health related) quality of life. Quality of life used to be assessed with generic measures, like the EQ-5D-5L<sup>4</sup> or with instruments developed specifically for MHC, such as the Lancashire Quality of Life profile (LQLP), and its shorter version, the Manchester Short Assessment of Quality of Life (MANSA).<sup>5</sup> The EQ-5D-5L is a standardised, non-disease-specific short self-report questionnaire and has been used extensively in both general health care and mental health care<sup>6</sup> in many countries including the Netherlands.<sup>7</sup> It measures health-related quality of life in multiple populations.<sup>4</sup>

In recent years, the recovery movement has gained traction and has inspired the development of a new measure, the Recovering Quality of Life (ReQoL) questionnaire, undertaken by the ReQoL Scientific Group at the University of Sheffield. Especially a in the development of this instrument. For example, part of the ReQoL has been based on the CHIME conceptual framework for recovery, which identifies five parts of (personal) recovery: Connectedness, Hope and Optimism, Identity, Meaning in life and Empowerment.<sup>8</sup> The development of the ReQoL was done in five stages. The first stage consisted of developing themes for the questionnaire. These themes were drawn from reviews<sup>9,10</sup> and interviews with service users,<sup>11</sup> after which the item-list was generated by service-users and the research team.<sup>12</sup> The last three stages consisted of testing and analyses to investigate the reliability and validity of the ReQoL for service users in the United Kingdom.<sup>13</sup> All stages were done by a core team of researchers, who were supported by a scientific group, an international advisory group, a stakeholders' group and an expert service user group.<sup>14</sup> There are two versions: a 10-item and a 20-item scale, the latter encompassing more wellbeing items. The instrument has satisfactory psychometric properties: the reliability (internal consistency) for both the ReQoL-10 and ReQoL-20 in the UK has been shown in patient samples to be  $\alpha = 0.85$  and  $\alpha = 0.90$  respectively, with  $r = .98$  correlation between the two versions. Convergent validity was supported by a correlation above  $r = 0.80$  across diagnostic groups with other instruments measuring similar constructs. Furthermore, the ReQoL appeared able to distinguish between clinical and general population samples.<sup>13</sup>

In the Netherlands, there is an increasing attention for recovery beyond mere symptom reduction. Consequently, the assessment of quality of life has gained attention as well,<sup>15-17</sup> and the patient perspective becomes more and more important.<sup>18,19</sup> This is similar to the ideas and theoretical basis in the UK.<sup>20,21</sup> Hence, the ReQoL, in a validated Dutch version, could be a worthwhile alternative to the EQ-5D and the MANSA since they both have shown to be problematic for use in mental health samples.<sup>22,23</sup> For example, the EQ-5D-5L has an emphasis on pain and (dis)ability<sup>3</sup> and the MANSA has been found to be strongly associated with depressive symptoms<sup>24-26</sup> and is not always shown to be sensitive to change of quality of life.<sup>27</sup> Therefore, we translated the ReQoL into Dutch with consent from the ReQoL

research group and this version is endorsed as the official Dutch version.

The aim of the present study is to investigate the psychometric qualities of the Dutch ReQoL version by comparing scores on the items and psychometric properties to the original English version of the ReQoL. We administered the ReQoL-20 to a convenience sample (university students). Convergent validity was investigated by comparing the ReQoL with the EQ-5D-5L and MANSA; divergent validity with the PHQ-9 and GAD-7. Furthermore, we investigated scores in a group of patients with a diagnosis of psychotic disorder and the association of their scores on the ReQoL-10 with the PHQ-9 and the GAD-7.

## Methods

### Study sample

#### Student sample

In order to investigate the Dutch version, the ReQoL was administered to a Dutch sample of university-level students. All students ( $N = 62$ ) completed the ReQoL-20, the EQ-5D-5L, MANSA, PHQ-9 and GAD-7 in a single sitting, and answered additional questions about having any psychological problems and receiving treatment for these problems, with 88.7 % not receiving any treatment. Age and gender were also assessed, with their age ranging between 19 and 31, with a mean of 23.5 ( $SD = 2.4$ ). Furthermore, most of the students were female ( $n = 46$ ). Recruitment was done anonymously through an internet-link, where they could complete the questionnaires in a single session. The link was brought to their attention through various Social Media and through various University news channels.

#### Patient sample

Furthermore, in order to test divergent validity in a patient population, the ReQoL-10 measurements of participants of the UP'S cohort study were compared to PHQ-9 and GAD-7 scores. UP'S is a cohort that investigates recovery for people with psychosis. All current participants of the cohort study that completed the interview ( $N = 164$ ) also completed the three questionnaires, as part of that larger interview. Age, gender, educational level, diagnosis and country of birth were also assessed. Participants are recruited for UP'S at different Mental Health Care centres in various teams specialised in in- and outpatient care. All patients were between 18 and 65 years of age and were in care for having a psychotic disorder, including schizophrenia, schizoaffective disorder, delusional disorder or psychosis not otherwise specified. The interviews were carried out by several Flexible Assertive Community Treatment (FACT) team members in the South-Western part of the Netherlands from which they received treatment. The characteristics of the current participants of the cohort, are shown in Table 1. The mean age was 40.1 ( $SD = 11.8$ ) at baseline (range 18-64) and 66.5 % were male. Furthermore, almost half of the group had a diagnosis of schizophrenia (48.2 %). For this group, symptom scores were calculated using the PANSS-Remission scale. This scale scores three positive, three negative and two generic symptoms on a one to seven scale, with one not having the symptom and seven having the symptom com-

**Table 1** Demographic characteristics of the student and patient sample.

	Student sample		Patient sample	
	N	%	N	%
Gender				
Men	16	25.8	109	66.5
Women	46	74.2	55	33.5
Educational level				
Primary school (normal or vocational)	–	–	32	19.5
General secondary education (lower, senior, pre-uni)	–	–	65	39.6
Higher vocational education	5	8.1	10	6.1
University Bachelor	16	25.8	–	–
University Master	41	66.1	15	9.1
Unknown	–	–	42	25.6
Receiving Care				
No	55	88.7	0	0
Yes	7	11.3	164	100

pletely interfere with daily life. For this patient sample, the mean PANSS-R score was 2.0 (SD = 0.78), with mean positive symptoms 2.1 (SD = 1.1), negative 2.2 (SD = 1.0) and generic 1.7 (SD = 0.9). All indicate very low symptomatology.

## Dutch version of the ReQoL

### Translation

The ReQoL group provided a license for translation of the ReQoL to the official Dutch version to CvdF-C. To develop the Dutch version of the ReQoL, the quality of the translation is essential, with equivalence in both terms and measured constructs. Therefore, an extensive translation procedure was followed.<sup>28,29</sup> First, a translation from English into Dutch was made by a small workgroup led by CvdF-C. Secondly, this first version was translated back to English by a native speaker. Any discrepancies between the original ReQoL and this translation were discussed by the work group and, when assistance was needed, discussed with the original Sheffield workgroup. Discrepancies in interpretation or meaning of items led to some revisions of the Dutch translation. Furthermore, the English version of the ReQoL contains a question about physical symptoms, the scoring of which is not considered in the original scoring instruction. In the official Dutch version, a scoring instruction for that question was provided as well. A technical report on the translation process can be retrieved from the authors.

### ReQoL and its constructs

The ReQoL measures Recovering of Quality of Life for the last week. There are two versions: a 10-item and 20-item version. The items of the 10-item version are the first 10 items of the 20-item ReQoL. Of the 20-items, 11 items are positively worded and nine are negatively worded. For the 10-item version, this is four and six, respectively. All items are scored on a five-level scale, ranging from 'None of the time' to 'Most of the time'. For the positively worded items, scoring is from zero to four whereas the negatively worded items are scored from four to zero. For both versions, a sum score can be calculated with higher scores indicating

a higher recovering of quality of life.<sup>12</sup> For the purpose of comparing both versions, a half-score will be calculated for the ReQoL-20 in this study.

During the early stages of the development of the ReQoL, 7 themes were identified as being important for recovering quality of life in MHC: Activity; belonging and relationships; choice, control and autonomy; hope; self-perception; well-being; physical health. These 7 themes were used as a base to generate items.<sup>12</sup> The ReQoL-20 version contains four questions on activity (questions 1, 3, 11 and 12), two on belonging and relationships (questions 2 and 9), three on choice, control and autonomy (questions 4, 7 and 15), two on hope (questions 6 and 8), 2 on self-perception (questions 10 and 14), 7 on well-being (questions 5, 13, 16, 17, 18, 19 and 20), and 1 on physical health. The first 10 questions of the ReQoL-20, make up the ReQoL-10 and therefore all themes are represented with two questions, except self-perception, well-being and physical health, which are represented by a single question. CvdF-C and EdB were members of the international scientific advisory group.

### UK version of the ReQoL

To evaluate the Dutch translation of the ReQoL, comparison with the original UK version of both the ReQoL-10 and ReQoL-20 is necessary. Validation and reliability for the ReQoL-10 and -20 have been established in the UK during the last three stages of development of the ReQoL. For the reliability assessment, a sample of both patients (N = 800) and general population members (N = 2000) were recruited through a market research company. The general population sample was representative for the UK general population in age, gender, ethnicity and geography. 74 % (N = 595) of the patient sample reported a common mental health disorder. Of them, 78 % reported very poor to fair mental health. 61 % of the total sample was female. Half of the group completed the ReQoL-10, the other half completed the ReQoL-20. Subsets of the patient (N = 141) and general population (N = 350) completed a second measurement two weeks later. For validity purposes, 4266 service users were recruited through secondary providers, general practices and voluntary organisations, either face-to-face, by post or through an online

channel. All service users completed a 40-item set, in which the ReQoL-10 and ReQoL-20 were embedded previous to getting to their final formats. Participants were from five diagnostic groups and were well distributed across groups by age, gender, marital status, main activity and ethnicity. 39 % reported good to excellent mental health and 32 % reported poor to very poor general health. All information has been obtained from Keetharuth et al.<sup>13</sup> and the developmental report of the ReQoL.<sup>12</sup>

## Other measures

### EQ-5D-5L and MANSA

The EQ-5D-5L measures health-related quality of life of today<sup>4</sup> with 5 items: mobility, self-care, usual activities, pain or discomfort, and anxiety or depression<sup>30,31</sup> and can be used to calculate quality-adjusted life-years (QALYs).<sup>32</sup> For responding, all questions have five response options, ranging from 'no problems (1)' to 'extreme problems (5)'. The EQ-VAS scale at the end, assesses the patients' self-rated health on a vertical 0–100 scale.<sup>33</sup>

Quality of life was measured by MANSA, which is a short version of the LQLP specifically developed to counter shortcomings of the LQLP, such as time to administer, change over time and comprises items best suited to discriminate between samples.<sup>34</sup> There is a 12- and a 16-item MANSA version consisting of only subjective items, or of both subjective and objective items. Four items investigate objective quality of life and 12 investigate subjective satisfaction with life as a whole, job, financial situation, friendships, leisure activities, accommodation, personal safety, people that the person lives with, family and health. For this study, only the 12 subjective items are used. Satisfaction is rated on a 7-point scale ranging from 1 = "could not be worse" to 7 = "could not be better", and an overall score of subjective quality of life may be calculated.<sup>5,34,35</sup>

### PHQ-9 and GAD-7

The Patient Health Questionnaire's depression module (PHQ-9) is a screener for depressive disorder<sup>36–38</sup> that is validated and used in multiple countries.<sup>39–41</sup> It is a 9-item self-report questionnaire, with each item representing a criterion for major depressive disorder in the DSM-IV. They are anhedonia, depressed mood, sleep problems, feeling tired, change in appetite, negative self-evaluation, concentration problems, psychomotor changes and suicidality. Each item assesses frequency of the symptom over the last two weeks and is scored from 'Not at all (0)' to 'Nearly every day (3)'. A sum score is then calculated that can range from 0 to 27, with scores ranging from 5 to 9 representing mild depressive symptoms, 10–14 moderate depressive symptoms, and 15–27 severe depressive symptoms.<sup>42</sup>

The Generalized Anxiety Disorder 7-item scale (GAD-7) is a brief self-report scale shown to be valid and efficient to screen for GAD. It consists of 7-items that assesses frequency of anxiety symptoms over the last two weeks, with scoring ranging from 'Not at all (0)' to 'Nearly every day (3)'. A total level of anxiety severity is calculated that can range from 0 to 21, with scores ranging from 5 to 9 representing mild anxiety, 10–14 moderate anxiety, and 15–21 severe anxiety. Last, if any of the items scores above 0, a final question

is asked once on the disabling effect of the symptom(s) in general.<sup>43</sup>

### Convergent validity

The ReQoL is based on 7-themes, which are activity, autonomy, belonging and friendships, hope, self-perception and well-being. The MANSA is based on life as a whole, a job, financial situation, number and quality of friendships, leisure activities, accommodation, personal safety, people that the individual lives with, sex life, relationship with family, physical health and mental health. Each question of the EQ-5D represents mobility, self-care, usual activities, pain or discomfort, and anxiety or depression. Comparison between the measurements results in the hypothesis that correlations between some subscales might be higher than between others. An overview of the comparison is given in Table 2. For example, it is expected higher correlations will be found between the ReQoL subscale 'activity' and the MANSA's 'Leisure activities'. Likewise, high correlations are expected to be found between the ReQoL 'Hope' subscale and the MANSA's 'Life as a whole'. A high negative correlation is expected to be found between the same ReQoL subscale and the EQ-5D anxiety item.

## Analysis

Skewness and kurtosis of the ReQoL items were considered and compared to the English original. Three scores were calculated: the ReQoL-20 total score, the ReQoL-10 total score, and a ReQoL-20 half score; this last score allows for direct comparison with the ReQoL-10 scores, as was also done in analyses of the ReQoL UK version. Furthermore, scores for the physical question of the ReQoL were calculated for both the student and patient sample. Cronbach's alpha was determined and inter-item correlations calculated. Pearson's product moment correlation coefficients were used to get an impression of the convergent validity between the ReQoL-20, EQ-5D-5L and MANSA in a student population. Furthermore, the ReQoL-10 and ReQoL-20 scores, as well as the PHQ-9 and GAD-7 for both samples were assessed. For the PHQ-9 and GAD-7, clinical cut-off scores ( $\geq 10$ ) were used as described by Kroenke et al.<sup>42</sup> to get an impression of the known group validity. Analyses will be done using SPSS 24.0.

## Results

### Basic psychometrics

Within the student sample, inspection of the distributions of the individual items revealed a substantial deviation from the normal curve for item 16 with 75.8 % of the respondents choosing the most extreme response category. The distribution of the items two and six was skewed as well, although less substantial. Means, standard deviations, skewness and kurtosis and range of summed scale scores are presented in Table 3. The mean and standard deviation for the ReQoL-10 and -20 (half score) in the student sample was 27.9 (SD = 6.9) and 27.9 (SD = 7.3) respectively. For the patient sample, inspection of the individual items on the ReQoL-10 showed no substantial deviations, although most items were somewhat skewed. Item 6 showed to be most skewed. For

**Table 2** Impression of the themes of the ReQoL with subscales of other measures.

ReQoL	MANSA	EQ-5D
Activity	Leisure activities	Daily activities
Autonomy	Job, Finances	
Belonging and friends	Friendships and relationships with family	
Hope	Life as a whole	Anxiety/depression
Self-perception		Self-care
Well-being	Safety, Mental health and accommodation	Mobility
Physical health	Physical health	Pain and discomfort

**Table 3** Distribution of scores on the ReQoL.

	N	Mean	SD	Range	Skewness	Kurtosis
ReQoL-20 (Scale 0–80)	62	55.6	13.7	22-77	-.48	-.69
ReQoL-20 (Scale 0–40)	62	27.8	6.9	11-38.5	-.48	-.69
ReQoL-10 (Scale 0–40)	62	27.9	7.3	11-39	-.48	-.69
ReQoL-10 (Scale 0–40) <sup>a</sup>	164	25.5	7.7	0-40	-.67	.35
ReQoL Physical (scale 0–4)	62	3.0	1.0	0-4	-.85	.18
ReQoL Physical (scale 0–4) <sup>a</sup>	164	1.2	1.2	0-4	.62	-.49

<sup>a</sup> Patient sample.

this patients' sample, only the ReQoL-10 total score could be calculated, showing a mean of 25.5 (SD = 7.7). Means are higher compared to the original version, were the ReQoL-10 was shown to have a mean of 21.99 (SD = 10.3) and the ReQoL-20 of 21.63 (SD = 9.97).

## Reliability

Cronbach's' alpha for the ReQoL-20 in the student sample was  $\alpha = 0.94$  ( $\alpha = 0.93$  UK version<sup>12</sup>). Furthermore, the inter-item correlation was  $r = 0.44$  (range = 0.15 to 0.83) indicating sufficient association among the items. Cronbach's alpha for the extracted ReQoL-10 was  $\alpha = 0.90$  ( $\alpha = 0.87$  UK version<sup>12</sup>), with an inter-item correlation of  $r = 0.47$  (range = 0.17 to 0.83). For the patient sample, the Cronbach's alpha for the ReQoL-10 items was  $\alpha = 0.87$  ( $\alpha = 0.92$  UK version<sup>15</sup>). Here, the inter item correlations was  $r = 0.40$  (range = -0.03 to .67).

## Convergent validity

In this study, only student data is available for the ReQoL-20, MANSA, and EQ-5D-5L. However, a first impression of the convergent validity can be obtained with this group. The short and long version of the ReQoL show similar correlations, both were significant ( $p < 0.001$ ) and all correlations were in the correct direction. Correlation between the ReQoL-10 and ReQoL-20 was  $r = 0.97$ . Furthermore, psychometric properties are similar between both versions. The ReQoL-10 correlated  $r = 0.74$  (0.76 after deleting the physical health subscale) with the MANSA and the ReQoL-20 showed a correlation of  $r = 0.72$  (0.75 after deleting the physical health subscale) with the MANSA. Correlations with the EQ-5D-5L were  $r = -0.58$  for both and thus overall lower than those of the ReQoL with the MANSA.

Subscales for all measures have been calculated. Correlations between the themes of the ReQoL and the themes of the MANSA and items of the EQ-5D are shown in Table 4.

Although correlations are overall low, there does seem to be a pattern of correlations as is expected: high between similar constructs and generally lower between dissimilar constructs. For instance, the correlation between the ReQoL theme autonomy and the MANSA life as a whole was high ( $r = .78$ ), as is the correlation between the same MANSA theme and the ReQoL total score ( $r = .79$ ). For the EQ-5D, depression-anxiety correlated highly negatively with the ReQoL themes autonomy ( $r = -.71$ ), hope ( $r = -.74$ ), self-perception ( $r = -.71$ ) and well-being ( $r = -.81$ ), and with the total score of the ReQoL ( $r = -.81$ ). Overall, the correlations of the MANSA theme 'Life as a whole' were high with all themes of the ReQoL, as were the correlations between the MANSA's 'Leisure activities' and Total score, and all ReQoL themes.

The physical impairment on the ReQoL showed low correlations with the MANSA physical subscale and somewhat higher correlations with the EQ-5D VAS scale and the EQ-5D pain and discomfort question ( $r = .41$ ,  $r = .59$  and  $r = -0.65$  respectively). Furthermore, correlations between this question and all other subscales of both the MANSA and EQ-5D were low.

## First impression of known-group validity

The ReQoL-10 and ReQoL-20 scores were higher for the student sample than for the patient sample, although not much. The range of scores for the students was smaller, indicating that there were no student respondents with a very low QoL. A small to medium Cohen's  $d$  (0.32) between the samples was found. The ReQoL-20 total half score for the students was calculated for comparison and showed almost no men-

**Table 4** Correlations between the themes of the ReQoL and corresponding themes on other measures.

ReQoL themes	MANSAs							EQ-5D					
	LA	JF	FR	Li	SMA	PH	Total score	DA	SC	MOB	ANX	PD	Total score
N = 62													
Activity	<b>.59</b>	.39	.42	.68	.44	.26	.56	-.40	-.04 <sup>a</sup>	-.07 <sup>a</sup>	-.60	-.37	-.47
Autonomy	.69	<b>.50</b>	.52	.78	.50	.44	.69	-.36	-.13 <sup>a</sup>	-.15 <sup>a</sup>	-.71	-.37	-.55
Belonging and friendships	.57	.24 <sup>a</sup>	<b>.50</b>	.64	.67	.37	.67	-.39	-.18 <sup>a</sup>	-.23 <sup>a</sup>	-.63	-.20 <sup>a</sup>	-.48
Hope	.63	.30	.36	<b>.67</b>	.42	.24 <sup>a</sup>	.53	-.16 <sup>a</sup>	-.20 <sup>a</sup>	-.16 <sup>a</sup>	<b>-.74</b>	-.09 <sup>a</sup>	-.38
Self-perception	.61	.32	.44	.64	.51	.23 <sup>a</sup>	.57	-.25 <sup>a</sup>	-.11 <sup>a</sup>	-.02 <sup>a</sup>	-.71	-.21 <sup>a</sup>	-.40
Well-being	.64	.32	.46	.68	<b>.62</b>	.35	.66	-.34	-.25	-.24 <sup>a</sup>	-.81	-.25	-.59
Physical health	.44	.29	.43	.53	.27	<b>.41</b>	.48	-.40	-.13 <sup>a</sup>	-.21 <sup>a</sup>	-.21 <sup>a</sup>	<b>-.65</b>	-.46
Total score	.73	.40	.53	.79	.68	.38	<b>.72</b>	-.39	-.19 <sup>a</sup>	-.18 <sup>a</sup>	-.81	-.31	<b>-.58</b>

<sup>a</sup> Non-significant correlations/LA=Leisure activities, JF=Job and Finances, FR=Friendships and Relationships with family, Li=Life as a whole, SMA=Safety, Mental Health and accommodation, PH=Physical Health, DA=Daily Activities, SC=Self-care, MOB=Mobility, ANX=Anxiety/Depression, PD=Pain and discomfort/correlations in bold are the correlations for similar constructs as mentioned in Table 2/correlations in italics are high (>.70) correlations between different constructs.

**Table 5** Known – group validity for the ReQoL.

	ReQoL-10				ReQoL-20							
	n	Mean	SD	Range	T	p	n	Mean	SD	Range	T	p
Student sample vs patient sample												
Student sample	62	27.91	7.3	11–39			62	27.77	6.9	11–38.5		
Patient sample	163	25.48	7.8	0–40	-2.14	.034					-	-
Comparing clinical cut-offs used in clinical practice												
PHQ-9 clinical versus non-clinical score complete sample <sup>a</sup>												
Clinical (score ≥ 10)	68	18.75	7.1	0–34			14	18.64	4.3	11–27		
Non-clinical	154	29.40	5.4	12–40	11.04	<0.001	48	30.44	4.9	20–38.5	8.15	<0.001
GAD-7 clinical versus non-clinical score complete sample <sup>a</sup>												
Clinical (score ≥ 10)	50	18.76	7.6	0–34			5	17.70	4.0	11–24.5		
Non-clinical	166	28.63	6.2	9–40	8.43	<0.001	51	29.80	5.5	15–38.5	4.76	<0.001

<sup>a</sup> Participants did not fill in the ReQoL-20. Therefore, scores for these in the complete sample consists of the students only.

tionable difference in mean and range with the ReQoL-10 scores of the same sample. Only SD differed a bit. For the entire sample (both students and participants), ReQoL-10 scores for the PHQ-9 clinically scoring sample was lower than for those non-clinical, as shown in Table 5. Cohen's *d* was 1.69 for the PHQ-9 groups on the ReQoL-10, and *d*=2.6 for the ReQoL-20. For the GAD-7 groups, Cohen's *d* was 1.42 for the ReQoL-10 and 2.5 for the ReQoL-20. The means were shown to a bit higher again compared to the original UK study. For example, the PHQ-9 clinical sample mean on the ReQoL-10 was 15.73 (SD = 7.53) and for the ReQoL-20 15.23 (SD = 7.08) in the UK. For the non-clinical sample, these were 27.37 (SD = 6.83) and 27.38 (SD = 6.57), respectively, which are lower than shown in Table 5.

## Discussion

This study reported on the development and evaluation of the translation of the official Dutch version of the Recovering Quality of Life questionnaire to Dutch. Translation of the ReQoL has been done according to international translation standards, with a translation and back translation, involvement of a native speaker and a discussion and resolution of the discrepancies between the original

and back translations, leading to adjustments in the first Dutch translation.<sup>28,29</sup> Some skewness on the items shows to be similar to the original ReQoL-20 measure, where the presence of some items showed to be redundant but were left in to assess concepts more extensively.<sup>16</sup> However, skewed distribution of responses on item 16 showed to be extreme during analyses. This item represents anxiety and showed skewness as could be expected in a sample of healthy respondents. However, a similar pattern on this item has not been seen for the general population in the original ReQoL validation<sup>13</sup> and current wording does instigate extreme answers. The item therefore lacks informational value and will be rephrased. Although other items showed to be skewed as well, skewness and kurtosis for these items did not suggest they should be rephrased.

Evaluation of the Dutch version of the ReQoL showed promising results. To start, reliability is shown to be good for the ReQoL-20 and the ReQoL-10 in a student sample and for the ReQoL 10 in a patient sample. Cronbach's alpha was similar to the original version on all occasions. Correlation between the two measures in a student sample was high, which is also in line with the original validation study by Keetharuth et al.<sup>13</sup> Furthermore, a first impression on convergent validity showed high correlations with

the MANSAs, but lower correlations with the EQ-5D. Although the original version showed higher correlations with the SWEMWBS and CORE-10, the correlation between the MANSAs and ReQoL were satisfactory for a small sample. Furthermore, the discrepancy in time period per questionnaire (day, week, two weeks) may have suppressed the inter-correlations, which could also explain the lower correlations between the MANSAs and the ReQoL compared to the original. High correlations were found between the ReQoL and the EQ-5D anxiety scale, which is in line with the main critique on the EQ-5D that it emphasizes too much on pain and disability.<sup>3</sup> Validity of the ReQoL is further supported by the high correlation between the MANSAs 'life as a whole' item and the ReQoL total score. The substantial negative correlation between the mood/anxiety item of the EQ-5D and the themes of hope, self-perception and well-being, shows that the ReQoL measures these 'opposites of anxiety' well.

Convergent validity was first supported by increasing correlations between the ReQoL measure and the MANSAs when physical items of the MANSAs were deleted. The increasing correlations are in line with the notion that the ReQoL measures non-physical domains of health-related quality of life, with less emphasis on pain and disability. Secondly, the ReQoL Physical health question correlated high with the Pain and Disability scale, the EQ-5D VAS scale and the total score of the EQ-5D. All underline that the ReQoL is indeed more focused on the non-physical domains of QoL and less on pain and disability. At the same time, it shows the need for a separate physical question with separate scoring. The non-physical domains of quality of life are most relevant for patients in MHC and therefore should be the main core.

Surprisingly, the convenience sample in this study showed lower quality of life compared to the general population in the original English study. This could be explained by the nature of the convenience sample, namely the sample consisting of students. Recent research showed that quality of life is low compared to non-studying peers,<sup>44</sup> making it harder to distinguish between them and the patient group. However, an impression of the known-group validity showed that the ReQoL is able to distinguish between clinical populations. Again, these measures show similar results to the original study.

Overall, the findings show that this official Dutch version of the ReQoL is valid. Furthermore, the correlations between the physical health question and the EQ-5D shows the validity and applicability of this question and supports the use of norm scores for this question. Overall, these advantages over existing measures, along with the fact that the ReQoL was developed from a service users' perspective<sup>15</sup> make the official Dutch ReQoL a valuable instrument for the Netherlands.

## Limitations

There are several limitations to this study. A convenience sample was used to test the ReQoL and they were not be representative for the population given for example their dispersion of gender. Complete data for the patient population was not yet available, making it impossible to calculate reliability of the ReQoL-20 and test-retest validity on both the ReQoL-10 and ReQoL-20 in this group. Compari-

son between groups on the ReQoL measures, as well as the use of clinical cut off in this group might have been compromised by limitations in both the convenience sample and the patient sample. The convenience sample of students showed low ReQoL scores in general, which might be a result of current pressure on students. The patient population, on the other hand, did show similar results on the ReQoL as compared to the original version, but also showed to be a clinically stable group with almost no symptomatology. One might argue that this does influence their quality of life score. Like the English original, the validation results were calculated on the embedded ReQoL-10. In an ideal situation, participants would be randomly assigned to either the ReQoL-10 or the ReQoL-20. This can be done when data collection on the ReQoL-20 is completed. Their measures can then be compared to that of the current patient population. Now, convergent validity could not be fully calculated since there was no patient data available for the ReQoL-20, the MANSAs and the EQ-5D. Furthermore, the student population was expected to score higher than the patients'sample on quality of life measures and with a smaller range of scores which limits the association with other QoL measures. However, the large patient population recruited across multiple MHC organizations, does make this sample ideal for use of the ReQoL.

## Further research

Although evaluation of the measure in a student sample, as well as evaluation of the short version of the measure in a patient population has shown some promising results, further research is needed. First, it is advised to study the Dutch version of the ReQoL-20 in a patient population, as well as a general population sample. Although the latter has been done, gender diversity in the sample was low, with most of the student sample being female. Furthermore, due to ongoing research, no data was available to evaluate test-retest reliability in a patient sample, nor was it possible to fit a bifactor CFA model in a patient sample, as is standard in validation studies. Comparison with studies on the original UK version of the ReQoL is advised.

## Ethical considerations

This study has been evaluated and approved by the accredited Dutch Medical Ethical Trial Committee (METC) of the Erasmus Medical Centre, as part of the UP'S cohort study. Students provided digital consent as part of the online questionnaire. All patients provided written informed consent.

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## Conflict of interest

The authors have no conflicts of interest to declare.

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