



An examination of the reliability and validity of the recovery capital questionnaire (RCQ)

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ABSTRACT

Aims and Background: Recovery capital refers to the resources people can call upon to initiate and sustain alcohol and drug problem resolution. Measuring this phenomenon could help an individual better understand their strengths as well as gauge the impact of any interventions designed to improve recovery capital and / or reduce addiction severity. This study aimed to test the internal consistency, stability reliability, criterion-related concurrent validity and content validity of the Recovery Capital Questionnaire (RCQ).

Setting and participants: Participants (n = 173) accessing community based addiction treatment (n = 108) and residential treatment (n = 65) in England and Scotland completed the RCQ at two time-points one week apart (n = 102) to test stability reliability, and also completed the RCQ alongside measures of quality of life and resilience (n = 152). Content validity was assessed by seven subject matter experts with content validity ratio and index calculated.

Findings: Cronbach's Alpha values (internal consistency) included: social $\alpha = 0.52$ (0.40–0.62); physical $\alpha = 0.73$ (0.66–0.78); human $\alpha = 0.85$ (0.82–0.88); community $\alpha = 0.85$ (0.82–0.88); RCQ Total $\alpha = 0.88$ (0.85–0.90). RCQ stability reliability (r = 0.89) and ICC (0.88) were calculated. Content Validity Index statistic of 0.91 was calculated. Correlations between relevant domains within the RCQ and WHOQOL Bref were found to include: r = 0.44, 0.59, 0.66 and 0.40. Correlations between RCQ and CD-RISC scores were calculated (r = 0.65).

Conclusion: The Recovery Capital Questionnaire was found to possess good overall internal consistency and stability reliability. Content validity was found to be strong and the RCQ demonstrated good concurrent validity with a measure of quality of life and a measure of resilience.

1. Introduction

Strengths and assets which can be called upon to initiate and sustain the resolution of alcohol and other drug (AOD) problems have been collectively termed 'recovery capital' (Granfield and Cloud, 1999). National strategies and guidelines from across the UK have called for the need to adopt a strengths-based approach in addiction treatment and assessment. For example the Independent Review of Opiate Substitute Treatment (Kidd, Lind and Roberts, 2013) and Rights, Respect and Recovery (Scottish Government, 2018) emphasise the need to take an assets-based approach while UK Clinical Guidelines state treatment should involve a transition from managing risks to building recovery capital (Independent Expert Working Group, 2017). A psychometrically sound way of assessing strengths could provide an evidence-informed approach in this policy area. This study aims to test the hypothesis that the Recovery Capital Questionnaire (RCQ), first developed by Burns

(2012), is a psychometrically appropriate instrument for use in addiction treatment.

In Granfield and Cloud's (1999) seminal study, participants, who had once met diagnostic criteria for a substance use disorder but no longer did, and who had achieved such a change without accessing treatment, reported a reduction in acute symptoms and harms associated with AOD problems. In addition, they reported drawing upon their resources, developing these, and improving their quality of life (QOL). The theoretical construct of recovery capital (RC) has been developed by other contributions including Granfield and Cloud (2001), White and Cloud (2008), Cloud and Granfield (2008), and Best et al. (2010) where it has been associated with concepts of quality of life and resilience.

While traditional treatment tends to exclusively focus upon reducing deficits (White, 2008), it very rarely considers improving QOL, despite the expectations of people accessing treatment (Laudet and White, 2008; Laudet, Stanick and Sands, 2009), and the strategies (e.g. Scottish

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Government, 2008, 2018) and guidance (e.g. Scottish Government, 2014; Independent Expert Working Group, 2017) which claim to steer it.

The policy and scientific literature holds implications for treatment. In addition to the UK Clinical Guidelines (Independent Expert Working Group, 2017), D'Aunno (2006) has found that systematically assessing RC alongside the traditional foci of assessments – deficits, needs and risks (White, 2007) – can have an impact on levels of care decisions. Cloud and Granfield (2001) suggest that, perhaps even independent of the intensity of AOD use, those who possess larger amounts of RC may be suitable for less intensive forms of addiction treatment. White and Cloud (2008) develop this in their 'quadrant model' where the type of intervention(s) someone requires, may depend in part on the balance of RC and addiction problem severity; where 'low / high' combinations of the former and latter can inform treatment decisions. An example might be those with high addiction severity and low RC may be more suitable for residential treatment than those with high addiction severity and high RC. Notwithstanding, someone should never be denied treatment because they have 'too much RC', instead, their RC should be pooled with treatment resources to best meet the person's needs and desired outcomes.

Before any new instrument is developed in any field, it is important to establish a need for it (Coaley, 2014). In a systematic review of the RC literature, Hennessey (2017) identified only three instruments designed to measure it: Sterling et al. (2008), Groshkova et al. (2013) and (Burns and Marks, 2013), with the latter independently appraised as being of excellent quality (Munton, Wedlock and Gomersall, 2014). Hennessey (2017) notes Sterling et al. (2008) reported their instrument was found to be statistically weak, with no significant relationships between their 23 item scale and measures of abstinence and addiction severity. Groshkova et al.'s (2013) exploration of the psychometric properties of the Assessment of Recovery Capital (ARC) has a number of design and methodological errors and limitations as well as philosophical differences from the instrument being reviewed in the current study. Examples of the former include the sample size for the reliability component being insufficiently powered but not reported as such, inappropriate reporting of internal consistency, and the inappropriate use of Principal Components Analysis. An example of the philosophical differences includes the fact that the ARC places primacy on abstinence, prompting a criticism that the instrument seems confused on whether it is attempting to measure recovery capital or recovery itself (Ashton, 2015). Another example of difference in their conceptualisation of RC is that the RCQ considers a construct called Community Capital (defined below) while the ARC does not. While there are other differences between the ARC and the RCQ, and the ramifications of the limitations of Groshkova et al.'s study may have impacted upon studies which have since used the ARC, it is sufficient to comment that there is scope for an alternative measure of RC.

The RCQ is a 36 item Likert response scale questionnaire which considers RC across four domains as set out in Burns (2012) and Burns and Marks (2013), which employs a combination of Cloud and Granfield's (2008) and White and Cloud's (2008) social, physical, human and community capital constructs with the following understanding: *social capital* embodies social and relational roles, involvement in social rituals and routines, emotional support and access to recovery-supporting information; *physical capital* is understood as physical health and well-being, sleep hygiene, recovery conducive housing, finances, diet, access to transport and physical appearance; *human capital* includes perception of past, present and future, self-efficacy and self-awareness, problem solving, patience, resilience, hopefulness, decision-making, knowledge, skills and abilities; *community capital* includes experiences of stigma, acceptance, and community safety combined with the availability of treatment opportunities.

Having established a relationship between RC and addiction severity (Burns and Marks, 2013), the aim of this research was to answer the following questions:

1. To what extent does the RCQ possess internal consistency as measured using Cronbach's Alpha?
2. To what extent does the RCQ possess stability (retest) reliability?
3. To what extent can the content of the RCQ be considered valid, based on the response of subject matter experts and use of Lawshe's Content Validity Ratio and Content Validity Index (1975)?
4. To what extent does the RCQ demonstrate concurrent validity with a QOL measure where the hypothesis is that such a relationship should be positive in direction and moderate to good in strength?
5. To what extent does the RCQ possess concurrent validity with a measure of resilience where the hypothesis is that such a relationship should be positive in direction and moderate to good in strength?
6. Where validity relates to the context of addiction treatment, can the RCQ be considered a valid and reliable measure of RC which can identify strengths and assets that can be harnessed by people accessing treatment and treatment staff to initiate and sustain the resolution of AOD problems?

2. Ethics

Ethical approval was granted by University of Stirling's School of Applied Social Science Ethics Committee on January 15th 2015. Participant recruitment from third sector sites was provided from the same body in July 2016. Participating organisations approved the study through their respective internal governance arrangements.

3. Materials and methods

3.1. Design

The primary component of the study adopted a purposeful random sampling strategy, where the process involved identifying a population of interest but participant selection was done in a systematic way which is not based on prior knowledge of the likelihood of outcome (Cohen and Crabtree, 2006). Because of the research design, there is an overall sample and two sub-samples for the primary component of the study; the overall sample is comprised of those who participated in either the validity *and* reliability components which required two interviews approximately one week apart or solely the former (i.e. the participant was unavailable for the follow-up interview). The Local Authority (LA) site involved in the study was a community based treatment provider while the third sector sites provided both community and residential treatment. Treatment delivered by these sites tends to be for alcohol, heroin, benzodiazepine, cocaine, crack cocaine or poly substance use.

Liaison with staff teams informed the creation of briefing packs and training sessions to prepare them for their role in identifying and interviewing participants using the data collection instruments. Consultation with treatment providers ensured data collection caused minimal disruption to service delivery.

The secondary component of the study which investigated content validity utilised a convenience sampling strategy to recruit subject matter experts (SMEs).

3.2. Participants

For the primary component of the study, participants (n = 173) were recruited from a community based LA (n = 108) treatment provider and a third sector providing both community and residential support (n = 65) across Scotland and England. 173 participants took part in the study: 155 participated in the concurrent validity component completing the RCQ alongside measures quality of life and resilience. 102 participants completed two RCQ's at least one week apart (some of whom did not complete the additional two instruments at first interview so could not participate in the validity component).

The inclusion criteria for the study included service users who were working with any of the recruitment sites (and so were over 18 yrs old)

and were able to provide informed consent. Treatment staff regularly use discretion regarding a person's ability to engage in treatment appointments due to, for example, intoxication; this discretion was applied to study participation. Additional guidance was provided to staff regarding when best to initiate a discussion about study participation (for example not when a service user presents in crisis) and data collection took place under the auspices of existing organisational provisions for information sharing (for example, their respective adult and child protection policies). Service users were provided with an information sheet along with appointment letters where possible but where not, these were provided on site and allowed time to consider the invitation to participate. It was made clear to participants that declining to participate or withdraw from the study at any time would not prejudice treatment.

The secondary component of the study, testing content validity, involved recruiting a sample of SMEs. Coaley (2014) suggests, in addition to the phenomena any proposed scale aims to measure, the SMEs should also understand the application of the scale (its context) and be considered to have a level of expertise in that area. Given this part of the study focused on the content validity of the RCQ, it was critically important that SMEs understood the concept of recovery capital more broadly and, in most cases, possessed experience of using the RCQ. While there are no fixed recommendations regarding the required number of reviewers, Gilbert and Prion (2016) suggest a panel of between five and ten experts is preferable while Lynn (1986) suggests more than ten is unnecessary. Ten SMEs were identified and invited to participate in the study. Of the seven SMEs who responded, one was an academic specialising in alcohol and drugs within a Scottish University, one held a senior policy making role and five had service delivery backgrounds from the LA site from where participants were recruited for study component one.

3.3. Measures

Staff from the treatment sites undertook interviews with participants by firstly collecting demographic data before moving to the RCQ (Burns and Marks, 2013), the World Health Organisation's Quality Of Life Bref (WHOQOL Bref; WHOQOL Group, 1998) and the Connor-Davidson Resilience Scale (CD-RISC; Connor and Davidson, 2003) to measure recovery capital, quality of life and resilience respectively. The WHOQOL Bref has been suggested to be the gold standard for assessing quality of life (Laudet, 2011) while the CD-RISC has been applied in a number of different settings and has been demonstrated to hold sound psychometric properties (e.g. Yu and Zhang, 2007; Jorgensen and Seedorf, 2008; Yu et al., 2011).

Lawshe's (1975) established model was used to systematically assess content validity. The model invites SMEs to review items and rate their utility within the RCQ. These ratings can be calculated to provide a content validity ratio (CVR) which in turn allows the calculation of the content validity index (CVI) i.e. the extent of agreement across SMEs regarding the validity of individual items and the scale. Participants consenting to take part in this secondary component of the study were provided with a copy of the RCQ inviting them to rate the validity of each item as either essential, useful but not essential or not necessary.

3.4. Analyses

The software package SPSS v23 was used to undertake data analysis computations. A data cleansing process and search for missing values was completed before any analysis was undertaken. Measures of central tendency and dispersion for each of the four RCQ constructs were calculated. Tests of normality of the data were undertaken.

Independent sample t-tests were undertaken to examine gender, treatment type, self-assessed problematic use, abstinence from alcohol or drugs, and prescription status where these were tested as the independent variable and RCQ total was dependent variable. A one-way

between-groups analysis of variance was undertaken to examine age and length of time in recovery while a two-way between groups ANOVA was undertaken to examine any interaction effects between age and gender, and RC. Where ANOVA detected a statistically significant result, Tukey's Honest Significant Difference (HSD) test was applied to establish where differences existed.

Correlations between the domains of the RCQ and the overall RCQ rating and the relevant WHOQOL domains and the overall CD-RISC rating were analysed to determine the strength and direction of any relationship between these variables. Cronbach's alpha, a measure of internal consistency which indicates how closely related a set of items are as a group, was used for the reporting of internal consistency. Pearson's correlation coefficient as well as intraclass correlation coefficients were used to assess stability reliability.

When reporting Intraclass Correlation Coefficients (ICC) Koo and Li (2016) explain that researchers should report the 'model', 'type' and 'definition' information. The model is 2-way mixed effects, because, by definition, the sample used in the retest is not a random sample (Portney and Watkins, 2000). The 'type' is a measurement of the mean of multiple measures ($n = 102$), and the 'definition' is absolute agreement, "absolute agreement definition should always be chosen for...test-retest...reliability studies because measurements would be meaningless if there is no agreement between repeated measurements" (Koo and Li, 2016, p159).

The responses in relation to content validity were analysed using Lawshe's (1975) Content Validity Ratio (CVR) and Content Validity Index (CVI) which can be used to indicate the extent of SME agreement. Lawshe (1975) provides the following to calculate a CVR and CVI: $CVR = (N_e - N/2)/(N/2)$, in which N_e is the number of SMEs rating an item as "essential" and N is the total number of SMEs. The formula allows calculation of a Content Validity Ratio (CVR) statistic for each of the RCQ items. The mean of these was calculated to identify the Content Validity Index (CVI) statistic for the RCQ as a whole. According to Lawshe (1975) an item can be considered to hold some validity if more than half of the SMEs rate it as essential.

4. Results

4.1. Descriptive Statistics

The sample ($n = 173$) was almost evenly split in terms of gender with 50.3% ($n = 87$) female, only one more than the 86 males. 63% ($n = 108$) were receiving community based treatment and 37% ($n = 65$) were receiving residential treatment. Participant age ranged from 21 to 66 yrs, with the average age of participant from both genders being 40 yrs old. 9.2% ($n = 16$) of the sample self-reported substance use as problematic, of which 75% were female. 81% ($n = 140$) and 88% ($n = 152$) reported to be abstinent from alcohol or drugs respectively. 37 participants reported receiving medication assisted treatment (MAT).

The length of time in recovery (defined as not using AOD problematically) ranged from zero days ($n = 13$) through to almost 7 years ($n = 1$). The mean time in recovery for the whole sample ($n = 173$) was 7 months ($SD = 12.94$). 71.7% (124) of the sample reported they were in recovery for 6 months or less, 14.5% (25) reported they were in recovery for 6–12 months, 12.1% (21) reported between 1 and 4 years and just under 2% ($n = 3$) reported being in recovery for over 5 years.

Measures of central tendency and dispersion for each of the four RCQ constructs (Table 1), results from the Shapiro-Wilk test and an inspection of histograms for each domain indicated the RCQ data to be negatively skewed in their distribution.

Table 2 shows the results from a series of independent samples t-tests, revealing the only statistically significant relationship between RCQ Total Scores and the variables assessed to be between RCQ Total scores and participant reported problem alcohol or drug use ($p = 0.009$). The magnitude of the differences in the means (mean difference = -13.74 , CI, -24.15 to -3.44) was small ($\eta^2 = 0.04$),

Table 1

Measure of Central Tendency with 95% CI and Dispersion for the Four RCQ Constructs and Total RCQ Score (n = 173).

	Social Capital Total	Physical Capital Total	Human Capital Total	Community Capital Total	RCQ Total
Mean (95% CI)	39.197 (38.38 – 40.01)	33.098 (32.03 – 34.16)	39.757 (38.66 – 40.86)	32.295 (31.16 – 33.42)	144.347 (141.31 – 147.38)
Std. Deviation	5.437	7.071	7.319	7.496	20.231

Table 2

Independent t-test Results of RCQ and gender, treatment modality, AOD use and MAT (n = 173).

		Gender		t-value	Sig.	ETA Squared
Variable		Males (n = 86)	Females (n = 87)			
RCQ	M	145.98	142.83	0.93	0.32	0.01
Totals	SD	20.25	20.22			
Treatment modality						
		Community based (n = 108)	Residential (n = 65)	0.49	0.62	0.001
RCQ	M	144.94	143.37			
Totals	SD	18.64	22.75			
Problem Drug and/or Alcohol use						
		Declared Problem Use (n = 16)	Declared No Problem Use (n = 157)	-2.63	0.009	0.04
RCQ	M	131.96	145.62			
Totals	SD	25.51	19.26			
Abstinent from Drugs						
		Yes (140)	No (33)	1.59	0.14	0.02
RCQ	M	145.29	138.29			
Totals	SD	19.51	24.59			
Abstinent from Alcohol						
		Yes (n = 152)	No (n = 21)	0.78	0.44	0.003
RCQ	M	144.93	141.98			
Totals	SD	20.57	19.39			
Abstinent from Drugs and Alcohol						
		Yes (n = 129)	No (n = 44)	1.12	0.26	0.007
RCQ	M	145.35	141.41			
Totals	SD	1.89	2.96			
Medication Assisted Treatment						
		Yes (n = 37)	No (n = 136)	0.51	0.64	0.002
RCQ	M	145.87	143.93			
Totals	SD	19.16	20.69			

accounting for approximately 4% in RCQ Total.

A one way between-groups ANOVA was undertaken to explore the impact of time in recovery on RCQ Totals. Participants were divided into three groups according to their time in recovery. (Group 1: 0–8 weeks [n = 63]; Group 2: 9–24wks [n = 61]; Group 3: 25–364weeks [n = 49]). The rationale for categorising in this way includes creating similar sized groups for comparison and because with relatively fewer participants in the sample exceeding 6 months in recovery, there was little value in subdividing this group further. There was a statistically significant difference (p < 0.001) in RCQ Totals for the three groups F (2, 170) = 7.99, p = 0.001. A medium effect size was found (eta = 0.08), explaining approximately 8% of the difference in RCQ Totals across the three groups, suggesting RC, as measured by the RCQ, grows with length of time in recovery. Post hoc comparisons using the Tukey HSD test indicated that the mean RCQ score for Group 1 (M = 137.44, SD = 22.61) was significantly different from Group 3 (M = 152.28, SD = 15.92). Group 2 (M = 145.28, SD = 18.58) was not significantly different from Groups 1 or 3.

A two-way between groups analysis of variance found that there were no significance differences in RC in relation to age and gender, for example RC in males is no higher than in females when age is considered as a moderator.

4.2. Reliability

Cronbach’s Alpha was used to calculate internal consistency for each sub scale – social (9 items: $\alpha = 0.52$ [CI,.40–0.62]), physical (9 items: $\alpha = 0.73$ [CI,.66–0.78]), human (10 items: $\alpha = 0.85$ [CI,.82–0.88) and community capital (8 items: $\alpha = 0.85$ [CI,.82–0.85) – as well as for the overall RCQ scale (36 items: $\alpha = 0.88$ [CI,.85–0.90]) and is reported in Table 3.

Pearson’s Correlation and Intraclass Correlation Coefficient were used to measure stability reliability of RCQ constructs and RCQ Total Scores from time point one and time point two, with at least one week between both. Results are presented in Table 4 and Table 5 respectively.

4.3. Validity

In relation to concurrent validity between the RCQ and the WHOQOL Bref, statistically significant correlations were calculated across the respective domains and are presented in Table 6.

Similarly, statistically significant correlations were calculated between RCQ variables and CD-RISC scores. These correlations are presented in Table 7.

In relation to content validity, the seven SME responses were calculated using the formula provided in Lawshe’s (1975) model and referred to in the Methods section. Each of the items within the RCQ received an ‘essential’ rating from > 50% of SMEs. The CVI statistic for the RCQ was calculated as 0.91, exceeding the 0.70 value suggested by Tilden, Nelson, and May (1990), and the 0.80 threshold suggested by Davis (1992) required to indicate strong content validity.

5. Discussion

In relation to the research questions and in the order they were posed above, the findings suggest the RCQ as a whole has acceptable internal consistency/internal reliability, with RCQ Social Capital found to have lower acceptability; the RCQ possesses good-to-excellent stability reliability; the RCQ, using Lawshe’s (1975) Content Validity Index, demonstrates strong content validity; with moderate to high positive correlations with QOL and resilience measures, the RCQ demonstrates good criterion-related concurrent validity with measures of QOL and resilience. When combined with findings from Burns and Marks (2013), which found negative correlations with addiction problem severity, it can be concluded that the RCQ is a useful measure; if RC increases this correlates with both reductions in addiction severity and with increases in resilience and QOL. It should be noted that this cross-sectional study does not purport causality amongst these variables.

The four sub scales of the RCQ were found to have levels of internal consistency ranging from $\alpha = 0.52$ (CI,.40 –0.62) for Social Capital through to.73 (CI,.66 –0.78),.85 (CI,.82 –0.88) and.85 (CI,.82 –0.85) for Physical, Human and Community Capital respectively. Three of these

Table 3

Internal Consistency Results (n = 173).

Recovery Capital Construct	Cronbach’s Alpha Value	CI 95% lower-upper bounds
Social	.52	.40 –0.62
Physical	.73	.66 –0.78
Human	.85	.82 –0.88
Community	.85	.82 –0.88
RCQ Total	.88	.85 –0.90

Table 4

Correlations between RCQ sub scales and RCQ Totals between time-point one and time-point two (n = 102).

Construct	Stability correlation (r)
Social Capital Total	.891 ^a
Physical Capital Total	.853 ^a
Human Capital Total	.821 ^a
Community Capital Total	.882 ^a
RCQ Total	.889 ^a

^a correlation is significant at 0.01 level (two tailed)

Table 5

Intraclass Correlation Coefficient Statistics for RCQ sub scales and RCQ Total scores (n = 102).

Construct	ICC statistic	CI 95% lower-upper bounds
Social capital	.891	.843 – 0.925
Physical capital	.850	.786 – 0.896
Human capital	.815	.736 – 0.872
Community Capital	.877	.822 – 0.916
RCQ Totals	.884	.829 – 0.921

four values exceed the benchmark suggested by Kline (2000) of .70. An explanation for the higher level of random error in the Social Capital domain within the sample could be due to how it was defined in the RCQ. Conceptually, social capital has been cited as both meaningful and meaningless (Farr, 2004; Fine, 2007) and very difficult to measure. Notwithstanding this point, Cronbach’s Alpha is a sample specific measure (DeVellis, 2017); future RCQ research will be instructive on the extent to which the Social Capital construct requires review. When considering the internal consistency of RCQ Totals, it can be seen to hold the highest value ($\alpha = 0.88$; CI, .85 – 0.90), a satisfactory level of internal consistency for a psychometric assessment (e.g. DeVellis, 2017).

It is not straightforward to compare internal consistency between the RCQ and the Assessment of Recovery Capital (ARC) because, despite convention, Groshkova et al. (2013) did not report it for that study. The ARC was used in other research however and internal consistency was reported there. McPherson et al. (2017) report reliability as being low to moderate with Cronbach Alpha statistics ranging from 0.225 to 0.710 while Mawson et al. (2015) reported $\alpha = 0.89-96$. In this context the Alpha statistics from the current study are more similar to the latter than the former.

Regarding stability reliability, where two RCQ tests were required at different time points, the average length of time between time points was just under nine days (M = 8.7, SD = 3.83), and over 90% of the sample had been re-interviewed within 11 days of time-point one. Overall, in terms of the correlation analysis, the RCQ was found to demonstrate very good stability reliability, with DeVon et al. (2007) proposing correlations > 0.7 could be considered high/very good. While correlation analysis provides some insight into reliability, and has traditionally been the key way of testing it (Coaley, 2014), Intraclass Correlation Coefficient (ICC) analysis is promoted (e.g. Koo and Li, 2016) because it provides information on the level of agreement

Table 6

Correlations between RCQ Variables and WHOQOL Bref Variables (n = 152).

	SC Total	PC Total	HC Total	CC Total	WHO SOC	WHO PHY	WHO PSYCH	WHO ENV
SC Total	–							
PC Total	.366 ^a	–						
HC Total	.427 ^a	.603 ^a	–					
CC Total	.199 ^a	.383 ^a	.351 ^a	–				
WHO SOC	.442 ^a	.301 ^a	.424 ^a	.227 ^a	–			
WHO PHY	.356 ^a	.588 ^a	.492 ^a	.148	.275 ^a	–		
WHO PSYCH	.435 ^a	.567 ^a	.658 ^a	.246 ^a	.495 ^a	.551 ^a	–	
WHO ENV	.297 ^a	.550 ^a	.364 ^a	.401 ^a	.236 ^a	.527 ^a	.467 ^a	–

^a Correlation is significant at the 0.01 level (2-tailed).

between two measures, which is critical in reliability analysis (Bruton et al., 2000).

The ICC analysis largely corroborates the correlation analysis. When interpreting and reporting the ICC, Koo and Li (2016) propose the following: when a confidence interval of 95% is applied, an ICC can be considered poor, moderate, good and excellent with values of less than 0.5, between 0.5 and 0.75, between 0.75 and 0.9 and over 0.90 respectively. The ICC statistics for the RCQ variables include: Social Capital ICC = 0.891 (CI, .843 – 0.925), Physical Capital ICC = 0.850 (CI, .786 – 0.896), Human Capital ICC = 0.815 (CI, .736 – 0.872), Community Capital ICC = 0.877 (CI, .822 – 0.916), RCQ Total ICC = 0.884 (CI, .829 – 0.921). In relation to reliability and taking cognizance of the Cronbach Alpha and correlation coefficient statistics, it is appropriate to conclude the RCQ possesses good reliability.

When comparing the reliability of the RCQ with the ARC (Groshkova et al., 2013), it is possible to conclude the RCQ is more reliable. Such a conclusion is caveated with the following: how the ICC statistic was calculated and sample size. Groshkova et al. (2013) performed reliability analysis on a sample of only 45 participants while the current study (n = 102) exceeded the suggested minimal sample size of > 100 (Kline, 2000). Groshkova et al. (2013) failed to report the methodology and rationale for the decisions taken in the ICC, for example those set out by Koo and Li (2016) regarding ‘model’, ‘type’ and ‘definition’, further limiting the ability to compare with other studies.

The RCQ has been found to possess strong content validity, demonstrated by a Content Validity Index (CVI) statistic of 0.91 when Lawshe’s (1975) Content Validity Ratio (CVR) and CVI method was applied. It is not possible to compare the RCQ’s CVI statistics to any other RC measures because no examples of content validity testing of other RC measures could be found.

An examination of effect sizes suggests that medium to large effect sizes exist between the RCQ and QOL variables reported when considered against Ellis’s (2010) criteria for effect sizes. That is to say that levels of RC, although not causing levels of QOL, go some way to explaining the levels in participant QOL, and that one variable is positively correlated with the other.

These results confirm the hypothesis that RC, as measured by the RCQ, is positively correlated with QOL as measured by the WHOQOL Bref. This hypothesis validates further the concept of RC, and the RCQ as

Table 7

Correlations between RCQ variables and CD-RISC.

	SC Total	PC Total	HC Total	CC Total	RCQ Total	CD Total
SC Total	–					
PC Total	.366 ^a	–				
HC Total	.427 ^a	.603 ^a	–			
CC Total	.199 ^a	.383 ^a	.351 ^a	–		
RCQ Total	.625 ^a	.808 ^a	.818 ^a	.685 ^a	–	
CD Total	.413 ^a	.510 ^a	.779 ^a	.186 ^b	.646 ^a	–

^a Correlation is significant at the 0.01 level (2-tailed).

^b Correlation is significant at the 0.05 level (2-tailed)

a measure of same. QOL has been found to be lower in those with AOD problems and those seeking treatment for AOD problems than in cohorts without these problems (Donovan et al., 2005; Smith and Larson, 2003). Similarly, when symptoms of AOD problems decrease, QOL has been found to improve, with Villeneuve et al. (2006) reporting increases in QOL during abstinence and decreases during relapse.

Correlations between the RCQ variables (the four domains and the RCQ Total scores) and Connor-Davidson Resilience Scale scores were found to be statistically significant at the 0.01 level with the exception of the correlation between RCQ Community Capital and the CD-RISC Total which was statistically significant at the 0.05 level. In order of strength of correlation, it has been found that RCQ Community Capital has the weakest correlation with CD-RISC scores ($r = 0.186$), RCQ Social Capital is moderately correlated ($r = 0.413$), while Physical, Human and RCQ Total scores had substantial and high correlations ($r = 0.510$; $r = 0.779$ and $r = 0.646$ respectively).

It appears appropriate that the strongest correlation between resilience and RC was found between RCQ Human Capital and CD-RISC totals (0.779). This may have perhaps been expected given that the RCQ Human Capital construct entails internal assets, many of which were thought to be important in resilience. That the RCQ Total correlation is lower (0.646) is perhaps an effect of combining the other constructs, which are clearly related to resilience (thus the high correlation) but do not speak to the construct of resilience as clearly as the Human Capital domain.

5.1. Policy and Practice Implications

The main implication for policy is that this research strengthens the basis for policy to be more assertively orientated around strengths-based approaches generally and RC specifically, not because of any political or moral reasons that working in a strengths-based way might seem to be the right thing to do but because the evidence demonstrates that levels of RC as measured by the RCQ correlates with levels of resilience, QOL and addiction severity.

Scotland's national strategy claims, "The success of this strategy depends on our ability to take an asset-based approach to working together to plan, invest and deliver in partnership" (Scottish Government, 2018, p6). It also commits to "...develop specific national guidance and standards for asset-based assessment and case management, linked to Quality Principles and the Health and Social Care Standards" (Scottish Government, 2018; p.30). The strategy also retains the ongoing commitment to the delivery of the *Quality Principles* (Scottish Government, 2014). The position asserted within the *Quality Principles* is that RC should be assessed at the beginning of treatment (Quality Principle 4) and when recovery care plans are being reviewed (Quality Principle 6). It should be noted, however, the recently published *Medication Assisted Treatment Standards* (Scottish Government, 2021) appears to weaken the commitments in this area insofar as there is no mention of strengths or an assets-based approach, no mirroring of the UK Clinical Guidelines (2017) regarding reducing risks and increasing recovery capital, and no recognition of the interface with (or replacement of) the *Quality Principles*. Clarity on this apparent inconsistency will be instructive regarding future approaches in Scotland and the role strengths and assets based assessment and approaches could play therein.

The findings from this research suggest the RCQ would be a valid and reliable assessment tool to help identify assets people possess, assets which treatment could develop which, if done effectively, could be correlated with a decrease in addiction severity and increase in QOL and resilience. Such findings are bolstered by other research including but not limited to Gilbert et al. (2021) who concluded from their study of RC during the COVID pandemic that RC proved to be a consistently protective factor and due to its malleability should serve as a focus for treatment intervention and outcome. These being the same types of treatment outcomes to which national strategies aspire and which

people who access treatment have been found to want.

5.2. Study Limitations

While the sample sizes may have been large enough to provide reliable conclusions and do not undermine the findings, a power analysis prior to undertaking the research would have perhaps allowed a more confident position to be taken in terms of sample sizes. To somewhat mitigate, confidence intervals and effect sizes have been provided to help contextualise and qualify the findings where appropriate. While the study design allows for comment on the reliability and concurrent validity of the RCQ, there have been other properties which have been outwith the scope of the design. For example, predictive validity has not been considered and divergent validity has not been examined in this study (but has been, to some extent in previous RCQ research [Burns and Marks, 2013]). A final limitation is that the study has no associated pre-registered protocol.

Notwithstanding the limitations noted, this study has found the RCQ as a whole has acceptable internal consistency/internal reliability and possesses good-to-excellent stability reliability; the RCQ demonstrates strong content validity and good criterion-related concurrent validity with measures of QOL and resilience. When combined with findings from Burns and Marks (2013), it can be concluded that the RCQ is a useful measure of the strengths and assets possessed by people trying to resolve AOD problems where if RC increases, this correlates with reductions in addiction severity and with increases in resilience and QOL.

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Declaration of Competing Interest

No conflict declared.

References

- Ashton, M. (2015) *Analysis of the Assessment of Recovery Capital*. Drug and Alcohol Findings UK. Available: https://findings.org.uk/PHP/dl.php?file=Groshkova_T.3.cab&s=eb [Accessed: 23 June 2019].
- Best, D., Rome, A., Hanning, K.A., White, W., Gossop, M., Taylor, A., Perkins, A., 2010. Research for Recovery: A Review of the Drugs Evidence Base Research for Recovery: A Review of the Drugs Evidence Base. Scottish Government, Edinburgh, Scotland.
- Bruton, A., Conway, J.H., Holgate, S.T., 2000. Reliability: what is it, and how is it measured? *Physiotherapy* 86 (2), 94–99.
- Burns, J. (2012) *Measuring Recovery Capital and Determining its Relationship to Addiction Problem Severity in a Treatment Seeking Population*. Master of Science Dissertation, University of the West of Scotland.
- Burns, J., Marks, D., 2013. Can recovery capital predict addiction problem severity? *Alcohol. Treat. Q.* 31 (3), 303–320.
- Cloud, W., Granfield, R., 2008. Conceptualizing recovery capital: expansion of a theoretical construct. *Subst. Use Misuse* 43 (12–13), 1971–1986.
- Coaley, K., 2014. *An Introduction to Psychological Assessment and Psychometrics*. Sage, London, England.
- Cohen, D. and Crabtree, B. (2006) *Qualitative research guidelines project*. Available: <http://www.qualres.org/HomeRand-3812.html> [Accessed 8 August 2019].
- Connor, K.M., Davidson, J.R., 2003. Development of a new resilience scale: the Connor-Davidson resilience scale (CD-RISC). *Depress Anxiety* 18 (2), 76–82.
- D'Aunno, T., 2006. The role of organization and management in substance abuse treatment: review and roadmap. *J. Subst. Abuse. Treat.* 31 (3), 221–233.
- Davis, K.A., 1992. Validity and reliability in qualitative research on second language acquisition and teaching. *Another researcher comments. TESOL Q.* 26 (3), 605–608.
- DeVellis, R., 2017. *Scale Development: Theory and applications, 4th edition.*, Sage, Los Angeles, USA.
- DeVon, H.A., Block, M.E., Moyle-Wright, P., Ernst, D.M., Hayden, S.J., Lazzara, D.J., Savoy, S.M., Kostas-Polston, E., 2007. A psychometric toolbox for testing validity and reliability. *J. Nurs. Scholarsh.* 39 (2), 155–164.

- Donovan, D., Mattson, M.E., Cisler, R.A., Longabaugh, R., Zweben, A., 2005. Quality of life as an outcome measure in alcoholism treatment research. *J. Stud. Alcohol, Suppl.* 15, 119–139.
- Ellis, P.D., 2010. *The essential guide to effect sizes: statistical power, meta-analysis, and the interpretation of research results*. Cambridge University Press, New York, USA.
- Farr, J., 2004. Social capital: A conceptual history. *Political Theory* 32 (1), 6–33.
- Fine, B., 2007. Eleven hypotheses on the conceptual history of social capital: a response to James Farr. *Political Theory* 35 (1), 47–53.
- Gilbert, G.E., Prion, S., 2016. Making sense of methods and measurement: Lawshe's Content Validity Index. *Clin. Simul. Nurs.* 12 (12), 530–531.
- Gilbert, P., Soweid, L., Kersten, S.K., Brown, G., Zemore, S.E., Mulia, N., Skinstad, A.H., 2021. Maintaining recovery from alcohol use disorder during the COVID-19 pandemic: the importance of recovery capital. *Drug Alcohol Depend.* 229, Article 109142.
- Granfield, R., Cloud, W., 1999. Coming clean: Overcoming addiction without treatment. NYU Press, New York, USA.
- Granfield, R., Cloud, W., 2001. Social context and “natural recovery”: The role of social capital in the resolution of drug-associated problems. *Subst. Use Misuse* 36 (11), 1543–1570.
- Groshkova, T., Best, D., White, W., 2013. The assessment of recovery capital: properties and psychometrics of a measure of addiction recovery strengths. *Drug Alcohol Rev.* 32 (2), 187–194.
- Hennessy, E.A., 2017. Recovery capital: a systematic review of the literature. *Addict. Res. Theory* 25 (5), 349–360.
- Independent Expert Working Group on Clinical Guidelines on Drug Misuse and Dependence Update 2017 (2017) *Drug Misuse and Dependence: UK Guidelines on Clinical Management*. London: Public Health England. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/673978/clinical_guidelines_2017.pdf [Accessed: 20 January 2020].
- Jorgensen, I.E., Seedat, S., 2008. Factor Structure of the Connor-Davidson Resilience Scale in South African Adolescents. *Int. J. Adolesc. Med. Health* 20 (1), 23–32.
- Kidd, B., Lind, C., Roberts, K., 2013. Independent Expert Review of Opioid Replacement Therapies in Scotland. Scottish Government, Edinburgh, Scotland.
- Kline, P., 2000. *A psychometrics primer*. England: Free Association books, London.
- Koo, T.K., Li, M.Y., 2016. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *J. Chiropr. Med.* 15 (2), 155–163.
- Laudet, A.B., 2011. The case for considering quality of life in addiction research and clinical practice. *Addict. Sci. Clin. Pract.* 6 (1), 44–55.
- Laudet, A.B., Stanick, V., Sands, B., 2009. What could the program have done differently? A qualitative examination of reasons for leaving outpatient treatment. *J. Subst. Abus. Treat.* 37 (2), 182–190.
- Laudet, A.B., White, W.L., 2008. Recovery capital as prospective predictor of sustained recovery, life satisfaction, and stress among former poly-substance users. *Subst. Use Misuse* 43 (1), 27–54.
- Lawshe, C.H., 1975. A quantitative approach to content validity I. *Pers. Psychol.* 28 (4), 563–575.
- Lynn, M.R., 1986. Determination and quantification of content validity. *Nurs. Res.* 35 (6), 382–386.
- Mawson, E., Best, D., Beckwith, M., Dingle, G., Lubman, D., 2015. Social identity, social networks and recovery capital in emerging adulthood: A pilot study. *Subst. Abus. Treat., Prev., Policy* 10 (1), 45.
- McPherson, C., Boyne, H., MacBeath, L., Waseem, R., 2017. Using the assessment recovery capital at an addiction treatment centre: a pilot study to validate utility. *ARC J. Addict.* 2 (2), 17–23.
- Munton, T., Wedlock, E., Gomersall, A., 2014. *The role of social and human capital in recovery from drug and alcohol addiction*. Health Research Board, Dublin, Ireland.
- Portney, L., Watkins, M., 2000. *Validity of measurements*. Foundations of Clinical Research: Applications to Practice, 2nd ed. Prentice Hall, New Jersey, USA.
- Scottish Government, 2014. *The Quality Principles - Standard Expectations of Care and Support in Drug and Alcohol Services*. Edinburgh. Scottish Government, Scotland.
- Scottish Government (2018) *Rights, Respect and Recovery: Scotland's strategy to improve health by preventing and reducing alcohol and drug use, harm and related deaths*. Edinburgh, Scotland.
- Scottish Government (2021) *Medication Assisted Treatment Standards for Scotland*. Edinburgh, Scotland.
- Smith, K.W., Larson, M.J., 2003. Quality of life assessments by adult substance abusers receiving publicly funded treatment in Massachusetts. *Am. J. Drug Alcohol Abus.* 29 (2), 323–335.
- Sterling, R., Slusher, C., Weinstein, S., 2008. Measuring recovery capital and determining its relationship to outcome in an alcohol dependent sample. *Am. J. Drug Alcohol Abus.* 34 (5), 603–610.
- Tilden, V.P., Nelson, C.A., May, B.A., 1990. Use of qualitative methods to enhance content validity. *Nurs. Res.* 39 (3), 172–175.
- Villeneuve, P.J., Challacombe, L., Strike, C.J., Myers, T., Fischer, B., Shore, R., Hopkins, S., Millson, P.E., 2006. Change in health-related quality of life of opiate users in low-threshold methadone programs. *J. Subst. Use* 11 (2), 137–149.
- White, W., 2007. Addiction recovery: its definition and conceptual boundaries. *J. Subst. Abus. Treat.* 33 (3), 229–241.
- White, W., 2008. *Recovery management and recovery-oriented systems of care*. Great Lakes Addiction Technology Transfer Center, Chicago, USA.
- White, W., Cloud, W., 2008. Recovery capital: a primer for addictions professionals. *Counselor* 9 (5), 22–27.
- WHOQoL Group, 1998. Development of the World Health Organization WHOQoL-BREF quality of life assessment. *Psychol. Med.* 28 (3), 551–558.
- Yu, X., Zhang, J., 2007. Factor analysis and psychometric evaluation of the Connor-Davidson Resilience Scale (CD-RISC) with Chinese people. *Soc. Behav. Personal.: Int. J.* 35 (1), 19–30.