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ORIGINAL RESEARCH

Reliability and validity of the Italian version of the 14-item Resilience Scale

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Background: In recent years resilience has gained clinical relevance in sociological, psychological, and medical disciplines, and a lot of scales measuring resilience have been developed and have been utilized in the western countries. The aim of the study was to assess the psychometric properties of the Italian version of the 14-item Resilience Scale (RS-14), by describing its validity and reliability. As agreed with the authors of the original English version of the RS-14, it was translated into Italian. Then the standard procedure for back-translation was followed.

Methods: In total, 150 participants among the nursing and professional education students of the University of Insubria of Varese and health workers of the "ASST dei Sette Laghi-Ospedale di Circolo" of Varese were enrolled. The responses to the questionnaires were collected only from the students and the health workers between the ages of 18 and 65 years who gave their consent to participate in the study from April to September 2015. A subsample of 26 students and health workers was retested on the RS-14, 5 weeks after the first assessment. The questionnaires were handed out to 214 people, and 150 sets of questionnaires (70%) were returned, of which eight were subsequently removed because >60% of the answers were missing. In order to ensure anonymity, every completed questionnaire was identified only via a code.

Results: No significant differences were found between the mean values of the resilience scores between women (76.1) and men (76.3), with unpaired *t*-test = –0.08 and *P*=0.93. Similarly, no difference between resilience scores were found between mean age group of 18–25 years (75.3) and 26–65 years (78.7), with *t*-test = 1.6. The overall Cronbach's alpha of the RS-14 is 0.88, *P*=0.10. The RS-14 is negatively correlated with the Beck Depression Inventory-Primary Care Version and the 12-item General Health Questionnaire and positively correlated with the World Health Organization Quality of Life-Brief Version. The test-retest reliability, assessed on the 26 subjects 5 weeks after the first evaluation, highlighted an intraclass correlation coefficient value equal to 0.65. Factor analysis retains three factors, and it considers the factor loadings >0.40: RS-14-06 ('I am determined') is loaded on all the factors and RS-14-12 ('In an emergency, I am someone people can generally rely on') is not loaded on any factor.

Conclusion: This study demonstrates that the Italian RS-14 has psychometric properties with a good level of internal consistency (Cronbach's alpha = 0.88), an adequate concurrent validity, verified by relationships with the other scales and as it was expected from literature, and an acceptable test-retest reliability.

Keywords: resilience, measuring scales, psychometrics, factor analysis, adolescence, adulthood

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Introduction

Resilience is the process of a capacity for or an outcome of successful adaptation despite challenging or threatening circumstances.[1] Resilient people are characterized by interior strength, competence, optimism, flexibility, and coping ability in the face

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of adversity.[2] They possess self-esteem, belief in their own self-efficacy, and a repertoire of problem-solving skills and satisfying interpersonal relationships.[3] Resilience is also defined as the dynamic capacity of an individual to modify his/her modal level of ego-control, in either directions, as a function of the demand characteristics of the environmental context.

In the recent years, resilience has gained clinical relevance in sociological and medical disciplines,[4–7] and psychological resilience has been characterized by the ability to bounce back from negative emotional experiences and by flexible adaptation to the changing demands of stressful experiences.[8]

Many scales that assess resilience have been developed and have been used in the western countries. These include the Brief Resilience Scale, Connor-Davidson Resilience Scale (CDRISC),[9] Baruth Protective Factors Inventory,[10] Resilience Scale for Adults (RSA),[11] Brief Resilience Coping Scale (BRCS),[12] and Wagnild and Young Resilience Scale (RS).[2] The RS-25 was developed by Wagnild from a qualitative data collected from 24 older women who had successfully recovered from a major life event.[13,14]

Resilience: relevance in adolescence and adulthood

A review of some of the aforementioned instruments revealed RS as the best instrument to study resilience in adolescents.[15] During adolescence, the development tasks can be faced without serious difficulties, and overcoming these development tasks (such as autonomy from parents, comparison with peer group, and acquisition of useful tools to experience new roles) could be a significant factor of protection from possible evolutionary breakdown. In fact, the resilient attitudes that are important during adolescence have been highlighted: conformism, pragmatism, and perseverance (typical of a realistic personality); ambition, optimism, and leadership skills (typical of an enterprising personality); precision, introversion, rationality (typical of an investigative personality),[16] because they are predictive characteristics of the school performance. A high-interest profile has been shown to be indicative of a good level of identity exploration and that the differentiation of interests is indicative of the level of identity commitment.[17]

RS is the first instrument developed for the study of resilience as well as one of the most widely used and accurate scale to measure resilience globally.[2,15,18] It has also been used in several population studies, all across the world, and it has short form made up by 14 items (RS-14) and has been translated into other languages.[2,19,20] Other benefits include ease of use, applicability in different age groups ranging from adolescent to elderly, and its basic constructs focus on positive psychological qualities rather than deficits.[10] The RS has shown good validity and reliability in several studies.[15,21]

The Resilience Scale and other scales measuring resilience that are already translated into Italian

The scales measuring resilience that are already translated into Italian and validated are as follows: Resiliency Attitudes and Skills Profile,[22] Adolescent Resilience Scale,[23] RSA,[24] BRCS,[25,26] 25-items Resilience Scale,[27] and CDRISC.[28,29] The aim of the study is to assess the psychometric properties of the Italian version of the RS-14, currently missing in literature, among the young adults with a higher level of education, by assessing its validity and reliability, with the authorization of the original authors who own the Intellectual Property of the scale.

Materials and methods

Subjects and procedures

The present study consisted of 150 participants enrolled among nursing and professional education students from the University and health workers of the "Ospedale di Circolo" of Varese. The responses to the questionnaires were collected only from the students and the health workers who gave their written consent to participate in the study, from April to September 2015. A subsample of 26 students and health workers was retested on the RS-14 5 weeks after the first assessment. In order to ensure anonymity, every completed questionnaire was identified only via a code, which was then used to examine the test-retest reliability. A convenience sample was analyzed, and all the subjects participated in the study for free.

The sample size was calculated by considering a value of Cronbach's alpha = 0.80, which is expected for the RS, and significantly different from a minimum of Cronbach's alpha = 0.70. With a power of 90% and an error fixed at 0.05, the total number of subjects needed was 140. The confirmatory factor analysis was performed to evaluate the construct validity of the RS-14 scale. The following model fit indexes were assessed: root mean error of approximation (RMSEA – good fit for value ≤0.05 and acceptable for value between 0.05 and 0.08), standardized root mean squared residual (SRMR – good fit for value <0.05 and a value between 0.05 and 0.10 is acceptable), goodness-of-fit (GFI), adjusted goodness-of-fit (AGFI), and Comparative Fit Index (CFI). For GFI, AGFI, and CFI scores ≥0.90 are considered adequate.[30] Internal consistency, convergent validity, and factor loadings were assessed through the initial assessment, and test-retest

reliability was assessed through the second assessment. The Provincial Health Ethical Review Board was consulted prior to the beginning of the study, and it determined that the study did not need authorization from the Board as the study involved healthy adults.

Instruments of study

RS-14

Wagnild and Young developed the 25-item Resilience Scale, as a self-report scale.[13] Subsequently, they developed a shorter scale as an offshoot from the 25 items that measures similar psychological concepts,[2] consisting of 14 items (RS-14). Wagnild discovered, by means of a principal components factor analysis to examine the factor structure of RS-14, the five characteristics of the resilience core: purpose, perseverance, self-reliance, equanimity, and existential aloneness (authenticity).[1,2,31]

The respondents to RS-14 were asked to state the degree to which they agree or disagree with each item on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree).[11,13] All the items are positively scored, and the minimum score on the 14-item scale is 14 and the maximum score is 98.

Wagnild has shown that a score <56 indicates a very low resilience level; a score between 57 and 64 indicates a low resilience level; a score between 65 and 73 indicates that resilience level is on the low end; a score between 74 and 81 indicates a moderate resilience level; a score between 82 and 90 indicates a moderately high resilience level; and a score >91 indicates a high resilience level.[17]

The original English version of the RS-14 was translated into Italian (Figure 1). Then the standard procedure was followed for back-translation.[32] The Italian translation was presented to a native English speaker who translated the Italian version back into English. The new English version was compared with the original English version, and the translator assessed that there were no significant differences between the two English versions (original and back-translated).

Other measures

Other measures of factors linked to resilience and outcome of resilience (such as depression, life satisfaction, and health) were used to verify current validity of RS-14.[13]

12-Item General Health Questionnaire

The GHQ-12 [33,34] is a measure of the common mental health problems/domains of depression, anxiety, somatic symptoms, and social withdrawal of the past 2 weeks.[35] It consists of 12 items, and each one has four possible responses, scoring from 0 to 3.[36] RS was shown to be negatively correlated with depression, anxiety, somatic symptoms, and social withdrawal that are all measured with GHQ-12.[25]

Beck Depression Inventory-Primary Care Version

The Beck Depression Inventory-Primary Care Version (BDI-PC) is a seven-item self-report questionnaire,[37–39] which assesses depressive symptoms like sadness and loss of pleasure, suicidal thoughts or wishes, pessimism, past failure, self-dislike, and self-criticalness in the last 2 weeks. The BDI-PC is scored by summing up the highest ratings for each of its seven items. Each item is rated on a 4-point scale ranging from 0 to 3.[40] RS compared with BDI-PC was shown to be negatively correlated with depression.[13,25]

World Health Organization Quality of Life-Brief Version (WHOQOL-Bref)

As RS was shown to be positively correlated with life satisfaction,[13] in the present study, RS-14 was compared with

Item	14-item Resilience Scale (English Version)	14-item Resilience Scale (Italian Version)
RS-14-01	I usually manage one way or another.	Di solito riesco a cavarmela in un modo o nell'altro.
RS-14-02	I feel proud that I have accomplished things in life.	Mi sento orgoglioso/a per le cose che ho realizzato nella mia vita.
RS-14-03	I usually take things in stride.	Di solito faccio le cose senza il minimo sforzo. Segnendo i miei tempi.
RS-14-04	I am friends with myself.	Sono amico/a di me stesso/a.
RS-14-05	I feel that I can handle many things at a time.	Sento di poter gestire molte cose allo stesso tempo.
RS-14-06	I am determined.	Sono determinato/a.
RS-14-07	I can get through difficult times because I have experienced difficulty before.	Posso affrontare momenti difficili perché ne ho già fatto esperienza in precedenza.
RS-14-08	Self-discipline is important.	Ho auto-disciplina.
RS-14-09	I keep interested in things.	Mantengo interesse nelle cose.
RS-14-10	I can usually find something to laugh about.	Di solito trovo qualcosa per cui sorridere.
RS-14-11	My belief in myself gets me through hard times.	Il credere in me stesso/a mi aiuta a superare i momenti difficili.
RS-14-12	In an emergency, I am someone people can generally rely on.	In una situazione di emergenza c'è qualcuno su cui posso contare.
RS-14-13	My life has meaning.	La mia vita è piena di significato.
RS-14-14	When I am in a difficult situation, I can usually find my way out of it.	Quando mi trovo in situazioni difficili di solito da solo/a un modo per uscirne.

Figure 1 The English version of RS-14 alongside the Italian version of RS-14.
Note: 1993 Gail M Wagnild and Heather M Young. Used by permission. All rights reserved. "The Resilience Scale" is an International Trademark of Gail M Wagnild and Heather M Young, 1993.[2]
Abbreviation: RS-14, 14-item Resilience Scale.

WHOQOL-Bref,[41,42] an abbreviated version of the WHOQOL-100 quality-of-life assessment. It returns the scores on four domains related to the quality of life: physical health, psychological, social relationship, and environment. It also includes one facet on overall quality of life and general health.[43]

Statistical analysis

The sociodemographic features (age class, sex, education, and marital status) were summed up using absolute and relative frequencies. The scores of the collected scales (RS-14, GHQ-12, BDI-PC, and WHOQOL-Bref) were summarized with mean and standard deviation.

The internal consistency reliability of the RS was evaluated using the Cronbach's alpha coefficient,[44] a value of $\alpha \geq 0.70$ is usually considered acceptable. An exploratory factor analysis with varimax rotation was applied, in the first test sample, to assess the construct validity. The Cattel's scree test and the Kaiser criterion were used to define the number of factors to retain.

For the subgroup of 26 subjects who have participated in the second round of testing, the Intraclass Correlation Coefficient (ICC) was calculated to evaluate the test-retest reliability. The commonly cited cutoff for ICC considers good values between 0.60 and 0.74.[45]

After calculating the total score for the RS (adding up all the scores of the 14 individual items), the concurrent validity among the RS-14 and other scales collected in the study was evaluated using Pearson's correlation coefficient.

Unparied *t*-test has been used to compare RS mean scores between men and women and between age groups (18–25 years and 26–65 years).

Following the examples of other studies that have validated a translation of the RS-14,[16,17] the statistical analyses used two-tailed tests. For all statistical evaluations, $P<0.05$ were considered indicative of significant differences.

All data analyses were performed using SPSS v15 (SPSS Inc., Chicago, IL, USA) and SAS v 9.4 (SAS Institute Inc., Cary, NC, USA) software packages.

Results

The questionnaires were given to 214 people, and 150 sets of questionnaires (70%) were returned back, of which eight were subsequently removed because >60% of the questions were unanswered. Therefore, the final sample consisted of 142 subjects.

Out of the 142 participants, 127 were women and 15 were men; 107 participants were 18–25 years of age, 14 were 26–35 years, 12 were 36–45 years, seven were 46–55 years, and two were 56–65 years old; 94 participants had high school diploma, 36 were graduated from college, four had lower secondary school diploma, and eight had a master's degree; 113 were unmarried, 25 married, three separated/divorced, and one widowed (Table 1).

The total mean score on the RS-14 was 76.13. No significant differences were found between the mean values of the resilience scores between women (76.1) and men (76.3), with *t*-test = –0.08 and $P=0.93$. Similarly, no difference between resilience scores was found between mean age group of 18–25 years (75.3) and 26–65 years (78.7), with *t*-test = 1.65 and $P=0.10$. The RS-14 items, mean, and standard deviation are presented in Table 2.

The overall Cronbach's alpha of the RS-14 is 0.88, and in Table 3, the Cronbach coefficient with deleted variables is displayed, and it does not show any significant increase or decrease in the alpha coefficients.

The indicators of concurrent validity of the RS-14 are shown in Table 4. The RS-14 is negatively correlated with the BDI-PC and GHQ-12 and is positively correlated with the WHOQOL-Bref. The test-retest reliability, assessed on the 26 subjects, 5 weeks after the first evaluation, highlighted an ICC value of 0.65 that is considered an adequate level of repeatability.[46]

On the basis of Cattel's scree test and Kaiser criterion, the factor analysis retains three factors (Table 5), and it considers the factor loadings >0.40. It was observed that RS-14-06 was loaded on all the factors, whereas, on the other side of the spectrum, RS-14-12 was not loaded on any factor.

The CFI, RMSEA, and the SRMR are equal to 0.91, 0.08, and 0.07, respectively, which indicate an acceptable fit of the model; however, GFI and AGFI values are under the adequate fit level (0.87 and 0.80, respectively).

Table 1 Distribution of sociodemographic variables, absolute and relative frequencies

Variable	Categories	N (%)
Age group in years	18–25	107 (75.3)
	26–35	14 (9.9)
	36–45	12 (8.4)
	46–55	7 (4.9)
	56–65	2 (1.4)
Sex	Male	15 (10.5)
	Female	127 (89.4)
Marital status	Married	25 (17.6)
	Single	113 (79.5)
	Divorced	3 (2.1)
	Widow/widower	1 (0.7)

Note: Total sample – men and women aged 18–65 years.

Table 2 14-item Resilience Scale (RS-14)[2]: descriptive statistics, mean, and standard deviation of the single items and the total score of the scale

Items		Mean	Standard deviation
RS-14-01	I usually manage one way or another.	5.82	0.97
RS-14-02	I feel proud that I have accomplished things in life.	5.60	1.17
RS-14-03	I usually take things in stride.	4.26	1.34
RS-14-04	I am friends with myself.	5.43	1.28
RS-14-05	I feel that I can handle many things at a time.	5.02	1.17
RS-14-06	I am determined.	5.74	1.19
RS-14-07	I can get through difficult times because I have experienced difficulty before.	5.13	1.36
RS-14-08	I have self-discipline.	5.71	1.18
RS-14-09	I keep interested in things.	5.55	1.08
RS-14-10	I can usually find something to laugh about.	5.95	1.02
RS-14-11	My belief in myself gets me through hard times.	5.33	1.37
RS-14-12	In an emergency, I am someone people can generally rely on.	6.04	1.15
RS-14-13	My life has meaning.	5.51	1.21
RS-14-14	When I am in a difficult situation, I can usually find my way out of it.	5.08	1.20
Total score		76.13	10.48

Notes: Total sample – men and women aged 18–65 years.

Table 3 14-item Resilience Scale (RS-14)[2]: internal consistency – Cronbach's coefficient

Item	Raw		Standardized	
	Item total correlation	If item deleted*	Item total correlation	If item deleted*
RS-14-01	0.58	0.87	0.57	0.87
RS-14-02	0.57	0.87	0.57	0.87
RS-14-03	0.50	0.87	0.50	0.88
RS-14-04	0.22	0.89	0.22	0.89
RS-14-05	0.36	0.88	0.35	0.88
RS-14-06	0.65	0.87	0.65	0.87
RS-14-07	0.59	0.87	0.60	0.87
RS-14-08	0.67	0.87	0.67	0.87
RS-14-09	0.46	0.88	0.46	0.88
RS-14-10	0.63	0.87	0.63	0.87
RS-14-11	0.70	0.86	0.70	0.87
RS-14-12	0.48	0.87	0.48	0.88
RS-14-13	0.65	0.87	0.64	0.87
RS-14-14	0.69	0.86	0.68	0.87

Notes: Total sample – men and women aged 18–65 years. *Alpha value if item is deleted.

Table 4 Evaluation of concurrent validity: Pearson correlations between the 14-item Resilience Scale (RS-14)[2] total score and BDI-PC,[37,39] WHOQOL-Bref,[41,42] and GHQ-12[33,34]

RS-14 (14 items)		
	Mean (SD)	Correlation coefficients
BDI-PC	0.25 (0.4)	–0.46*
WHOQOL-Bref	95.4 (8.8)	0.35*
GHQ-12	15.3 (4.4)	–0.34*

Notes: Total sample – men and women aged 18–65 years. *$P<0.0001$.
Abbreviations: BDI-PC, Beck Depression Inventory-Primary Care Version; GHQ-12, 12-Item General Health Questionnaire; SD, standard deviation; WHOQOL-Bref, World Health Organization Quality of Life-Brief Version.

Table 5 14-item Resilience Scale (RS-14)[2]: exploratory factor analysis and rotated factor pattern

Resilience characteristic	Items	Factor 1	Factor 2	Factor 3
Self-reliance	RS-14-01 (I usually manage one way or another)		0.73	
Self-reliance	RS-14-05 (I feel that I can handle many things at a time)		0.68	
Self-reliance	RS-14-07 (I can get through difficult times because I have experienced difficulty before)		0.61	
Self-reliance	RS-14-12 (in an emergency, I am someone people can generally rely on)			
Self-reliance	RS-14-14 (when I am in a difficult situation, I can usually find my way out of it)		0.50	
Purpose	RS-14-02 (I feel proud that I have accomplished things in life)	0.72		
Purpose	RS-14-09 (I keep interested in things)	0.72		
Purpose	RS-14-13 (my life has meaning)	0.81		
Equanimity	RS-14-03 (I usually take things in stride)		0.38	
Equanimity	RS-14-10 (I can usually find something to laugh about)	0.45		
Perseverance	RS-14-06 (I am determined)	0.42	0.41	0.41
Perseverance	RS-14-08 (self-discipline is important)			0.50
Authenticity	RS-14-04 (I am friends with myself)			0.94
Authenticity	RS-14-11 (my belief in myself gets me through hard times)			0.56

Notes: Total sample – men and women aged 18–65 years. Only factor loadings >0.40 are reported (except for RS-03 item).

Discussion

The mean RS-14 score found in this study is 76.13; therefore, the sample demonstrated a moderate resilience level, and it is similar to the English RS-14 version which has the mean value 76.17, and it is higher than the Japanese version mean score (63.78).[2,18]

No statistically significant differences were found while comparing the mean resilience scores of male versus female from different age groups. This evidence agrees with the original studies by Wagnild and Young, who did not find a significant difference in resilience by age or sex.[13]

Regarding the split by sex, it is important to acknowledge that in our sample population, there is a large share of women (15 males versus 127 females), which is related to an emerging pattern in the health care workforce. As found in other studies, the vast majority of today's health care workers are women, who have entered traditionally male-dominated professions in large numbers and have made many newer health professions female-dominated.[47]

The value of Cronbach's alpha (0.88) is in line with consistency evaluation reported for the original version of RS-14, thus confirming the internal consistency of the RS-14 Italian version.

As expected, resilience (RS-14) was found to be positively correlated with life satisfaction as assessed by WHOQOL-Bref and negatively correlated with depression symptoms as assessed by BDI-PC, and anxiety and general health psychological status as assessed by GHQ-12. Since life satisfaction is a measure of adaptation and adaptation is part of the theoretical definition of resilience, the relationship between resilience and life satisfaction was assessed in other studies also which produced positive results.[13] Thus, it can be stated that, effectively, resilience promotes adaptation.[13]

RS-14 was shown to be negatively correlated with depression and anxiety symptoms as assessed by BDI-PC and GHQ-12. The same results were obtained by validation studies of the original English versions of RS-14 and RS-25[13] and the Italian version of RS-25.[25,48] Resilience implies inner strength, competence, optimism, flexibility, and the ability to cope effectively when faced with adversity.[2] In fact, resilience, in its definition, stands in opposition to depression disorders, defined as a pathological sadness disproportionate to a possible reason; it is rigid, independent of the context, accompanied by aggressiveness, irritation, and rejection.[49]

In this study, test-retest correlation was used, and it is found that inter-reliability is acceptable. The result is different from what can be found in the literature, where the studies have found a better reliability in RS.[13,14] A low reliability could be linked to the fact that the sample was too homogeneous.[50]

The factor analysis, run on the whole sample, loads only on three factors, showing a construct validity less than acceptable. For explorative purpose, the factor analysis was applied only to the age group of 26–65 years, which is smaller but more heterogeneous than the other age group (18–25 years); we extracted five factors and the results show a more acceptable construct validity (data not shown).[2]

One possible explanation can be found in the characteristics of the sample that was analyzed. The participants were all students who were mostly young, single women, without past history of psychiatric illness and not randomly selected.[18] These evidences suggest that a more heterogeneous sample could demonstrate a better construct validity for the Italian version of the RS-14.

Furthermore, in the factor analysis, it is found that perseverance loads on the same factor as authenticity while self-reliance loads on equanimity. In other studies, a significant correlation is found between the common indicators of resilience and self-acceptance, positive relations with others, autonomy, the ability to affect the environment and society, purposefulness in life, personal growth and a sense of belonging, authenticity, and general well-being in the age group of early maturity.[51] In a recent study, focused on young adults (between 17 and 24 years of age) self-reliance has been observed not only as an outcome, but as an identity that may inform the processes by which some youth form relational connections into adulthood.[52] The validated Italian version of RS-14 could be used in clinical and research settings.

Limitations

This study has some limitations. The sample is too homogeneous and made up by young females, unmarried and with a high-school diploma. We plan to extend the study to a larger and more diverse population engaging outpatients of the "Clinic for anxiety and depressive disorders", of the "Ospedale di Circolo" in Varese. We are anticipating for the authorization of the Health Ethical Review Board to conduct an extensive study.

Conclusion

This study demonstrates that the Italian version of the 14-item Resilience Scale has psychometric properties with a good level of internal consistency (Cronbach's alpha = 0.88), and an adequate concurrent validity, verified by relationships with the other scales and as it was expected from literature and adequate level of repeatability (ICC = 0.65). As expected, resilience (RS-14) was positively correlated with life satisfaction as assessed by WHOQOL-Bref, negatively correlated with depression symptoms as assessed by BDI-PC, and anxiety and general health psychological status as assessed by GHQ-12. In order to obtain results that are more robust, the study limitations are being addressed with the recruitment of an additional and less homogeneous population.

Disclosure

The authors report no conflicts of interest in this work.

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