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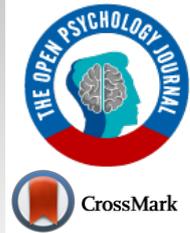
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**RESEARCH ARTICLE**

# The Egyptian Validation Study of the Resilience Scale for Adults (RSA) and its Utility in Predicting Depression

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**Abstract:**

***Aims:***

The present study aims at validating the RSA and examining its incremental validity as a predictor of depression as measured by Beck Depression Inventory (BDI).

***Methods:***

150 healthy participants completed the RSA, Sense of Coherence Scale (SOC), and Beck Depression Inventory (BDI). After ensuring the psychometric properties of the RSA, SOC, and BDI, 220 Egyptian students were recruited from Minia University to fill in the RSA and BDI in order to assess the potential capacity of the RSA to predict depression.

***Results:***

Confirmatory factor analysis indicated that the 5-factor structure model fitted well and the goodness of fit indices were within the acceptable limits. Construct validity was shown by a positive correlation between the RSA and the SOC, and a negative correlation with the BDI. The RSA and its subscales significantly predicted the BDI even when accounting for age and gender.

***Conclusion:***

The RSA is a valid and reliable instrument for measuring resilience in the Egyptian sample and it could be useful for measurement and intervention. The findings highlight the incremental validity of the RSA as a good predictor of depression.

**Keywords:** Resilience, Resilience scale for adults, Depression, Beck depression inventory, Sense of coherence, Egyptian students, Validation, Prediction.

## 1. INTRODUCTION

Resilience, as an adaptive psychological concept, is regarded as a multi-dimensional construct [1]. The lack of a unified methodology and poor concept definition is seen as a crucial challenge in the face of resilience research [2]. Generally, it refers to the ability to properly adapt to stressful life events using family, social and external support pathways [3]. "Resilience can be viewed as a defense mechanism, which enables people to thrive in the face of adversity" [2, 4]. Resilience studies are mainly concerned with those who can survive despite the presence of adversities without suffering from psychiatric difficulties. Likewise, in treatment interven-

tion programs, increasing resilience resources may hinder the probability of relapse of psychiatric problems [5].

Generally, resilient individuals are able to sustain normal development despite different adversities because they are more flexible than their vulnerable peers. They flexibly cope with their environment using different protective techniques. Several authors indicated that resilience depends on keeping favorable dispositional behaviors like optimism, passionate social relationships, and positive self-image [3]; optimistic view in the future and transparent organization of life [6, 7].

Knowledge on Egyptian University students' vulnerability to depression is too limited. Keeping in mind that "Depression is the most common psychiatric disorder in people who die by suicide" [8] and that most non-resilient tend to have depression

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symptoms; it will be insightful to examine the correlation relationship between depression and resilience construct. The main aims of the present study were twofold: firstly, to validate the Resilience Scale for Adults (RSA) using an Egyptian sample secondly, to identify the incremental validity of the RSA scores in predicting depression.

Depression as a risk factor plays a key role in the individual's transition from suicidal ideations to suicide attempts [9]. According to Wilkinson *et al.* [10], "Suicide is the third leading cause of death in adolescents and young adults in the United States and the second leading cause in European countries. Almost bout 16.2% of the depressed adolescents (*N* = 36,757) reported suicidal ideations in the past 12 months and 8.2% reported lifetime suicide attempts [11]. Although recent studies have documented that resilience is negatively associated with depression, little is known about the prediction of depression *via* resilience in Egyptian context. Understanding resilience is important in terms of guiding the development of interventions designed to remediate or prevent mental disorders such as depression and anxiety [12].

## 2. LITERATURE REVIEW

Resilience has been extensively investigated in the light of two hypothesized models: protective and compensatory [13]. A compensatory model states that the protective factors and resources operate regardless of stress levels. In contrast, a protective model assumes that the protective factors are stimulated in the face of setbacks and adversities [14]. Previous studies have provided evidence that support a protective model [15]. While other studies support the compensatory model of resilience [5].

Resilience is a dynamic process related to an individual's capacity to cope with difficult or stressful experiences and ability to psychologically overcome adversity [16]. According to Capanna *et al.* [17], previous literature suggested that resilience can be divided into three main categories: positive personal characteristics, supportive coherent family atmos-phere, and external support resulting from relationship with others who provide adaptive coping strategies. Accordingly, Resilience improves well-being [18]. Other researchers further described resilience as the ability to maintain psychological balance after exposure to stressful life events [19]. Resilience is regarded as a key factor helping in adjustment during emergencies and pandemics [20]. The increasing interest in resilience is mainly stimulated by the possibility of detecting protective factors and mechanisms necessary to prevent the development of psychiatric disorders such as depression [5].

Friborg *et al.* [3] developed resilience scale for adults using 59 patients and 276 normal controls. Factorial analysis yielded five dimensions: personal structure, α = 0.90, social competence, α = 0.83, family coherence, α = 0.87, social support, α = 0.83, and personal structure, α = 0.67. Results indicated adequate internal consistency. Reliability of test retest ranged between 0.69 and 0.84. Criterion validity was ensured by the positive correlation with sense of coherence scale (SOC) (r=0.33-0.75, P<0.01) and its negative correlation with Hopkins symptoms checklist-25 (HSCL) (r=-0.19 − -0.061, P<0.01).

Friborg, Martinussen, & Rosenvinge [21] improved the construction of the scale and adopted semantic differential response format as an alternative to the Likert style to compare between the two styles with respect to the psychometric properties of the resilience scale for adults. Results indicated that the factor structure in the semantic style version was better in model data fit than the Likert type. Hjemdal *et al.* [5] developed the resilience scale for adolescents depending on the resilience scale for adults and examined its validity in predicting depressive symptoms in 387 Norwegian adolescents. Results indicated that the scale had adequate psychometric properties and it was a significant predictor of depression and social anxiety symptoms.

Cross cultural validation of the RSA scale was reported in several studies [3, 5, 15, 16], for example, Hjemdal *et al.* [22] explored the construct validity of the Resilience Scale for Adults in a French-speaking Belgian sample and examined measurement invariance between the Belgian sample (*N* = 363) and a Norwegian sample (*N* = 315). Positive and negative significant correlations with SOC-29 and HSCL-25 respectively, were found. The metric invariance was supported, with the exception of one of the six RSA factors. Authors concluded that the RSA was found to be a valid and reliable self-report measure of protective factors and confirmed its cross-cultural validity.

Recently, Daniilidou, & Platsidou [23] constructed Teachers' Resilience Scale -25items based on the Connor-Davidson Resilience Scale (CD-Risc) and Resilience Scale for Adults (RSA). A combination of two factors (12 items) of the CD-Risc and RSA (13 items) respectively were included to form the newly constructed scale to assess the protective factors in Greek teachers. Exploratory and confirmatory asserted the good fit of the 4-factor solution: Personal Competencies and Persistence (α = .82), Family Cohesion (α = .74), Social Skills and Peer Support (α = .81), and Spiritual Influences (α = .67).

Unlike other scales, the RSA measures both the interpersonal and the intrapersonal protective factors that are believed to facilitate the coping adjustment of the individual to emotional and social adversities [3]. This double function of the scale is consistent with the nature of resilience as a multidimensional construct. RSA has been translated into many languages (Spanish, Persian, French, Turkish, *etc.*). Results of previous research have asserted its factorial structure and internal reliability and validity [22 - 25]. To the knowledge of the present authors, the RSA has not been validated in Egyptian context thus far.

Several studies have been conducted in the light of the three models of resilience inspired from the works of [26]. Those three models are the protective factors, the compensatory, and the challenging model. The first one includes IQ, better cognitive functioning, and high social economic status, while the compensatory model assumes that individuals think positively even in painful and stressful situations. The third model posited that a moderate level of challenging stressors work as motivating power pushing individuals to be resilient. Rutter in Wald *et al.* [27] argued that resilience is a process or a mechanism not a variable or a

factor. He identified three broad protective factors: personality coherence, family cohesion, and social support.

O'Leary & Ickovics [28] proposed a theory based mainly on the assumption that challenge represents a valuable opportunity for individuals to change, grow and attain resilience. According to this theory, people respond to a challenging situation in three ways: survive, recover or thrive. Saakvitne, Tennen, & Affleck [29] presented a theory of resilience composed of five areas: (a) individual's unique way of understanding self and the world, (b) Self capacities, (c) ego resources, (d) central psychological needs, (e) perceptual and memory system. Another theory presented by Epel, McEwen, & Ickovics [30] focusing on physical thriving. They assumed that when individuals perceive stressful events as controllable, they can show resilient psychological and physical functioning. Richardson [31] conceptualized resilience is a human force within everyone that drives them to seek self-actualization, altruism, and wisdom. This theory is based on the idea of bio-psychological balance among body, mind and spirit. According to this theory, disruption can lead individuals to gain resiliency factors. Tedeschi, & Calhoun [32] focused their theory of resilience on post traumatic growth describing it as the ability to respond well to adversities and cope with stressful life events. Advocating a positive psychological perspective, Joseph, & Linley [33] presented the organismic valuing theory. They posited that individuals assimilate experiences, then they accommodate those experiences either in positive (growth), or negative (psychopathology) directions.

## 3. THE PRESENT STUDY

To the knowledge of the authors, there is a lack of objective instruments for the direct measurement of resilience in the Egyptian context. Similarly, Hjemdal *et al.* [5] posited that the field of resilience has converted from theory to application and that the scarcity of a valid and reliable direct measure of the protective factors of resilience represents one of the essential obstacles. This lack of valid and reliable measurement instruments of resilience decreases our knowledge of that construct [17]. So constructing measures that can reliably identify protective factors for psychiatric disorders with high prevalence such as depression, is of general interest [5]. Although a considerable number of resilience scales have been developed after 2015 in Western settings [16, 17, 22 and 23], the Resilience Scale for Adults is considered one of the few rating scales which directly and properly measure the resilience construct. This scale is easily administered because it is a 37-items self-report questionnaire for adults to measure five subscales of resilience.

Several authors in different countries have examined its factorial structure. It was validated in Italy, Iran, Brazil, Belgium, and Norway [22, 34, 35]. Notwithstanding the good psychometric properties of the RSA, it was not validated in the Egyptian context up till now. It is well acknowledged that the diversity of cultural backgrounds requires cross-cultural validation studies to ensure the validity of the measurement tools in different cultural settings [17]. Moreover, the relation between resilience and depression was analyzed in clinical and non-clinical participants in different contexts [34, 35].

Unfortunately, the case was not applied to the Egyptian context. Accordingly, authors of the present study were motivated to pinpoint that relationship.

The RSA was selected to be validated because this measure was not validated in the Egyptian context despite its worldwide reputation as "a valid measure of protective resilience factors as stated by Hjemdal *et al.* [15]. It was previously validated in different cultures, but it was not in Egypt so far. The interpersonal and intrapersonal protective factors measured by this scale were thought to facilitate the adaptation to life adversities and setbacks. In addition, it is a 7-point semantic scale type and easy to administer because it consists of 37 items.

## 4. METHODS

### 4.1. Instruments

#### 4.1.1. Resilience Scale for Adults (RSA)

The Resilience Scale for Adults measures the protective resources that promote resilience and identifies the main protective factors involved in regaining and maintaining mental health [3]. To assess the criterion validity of the RSA, one discriminant scale and one convergent scale were administered with the participants at the same time, namely, Sense of Coherence Scale (SOC), and Beck Depression Inventory (BDI). All correlations of the subscales of the RSA and SOC were positive and significant, ranging from 0.466 to 0.631. The personal structure subscale correlated highest ($r = 0.631$, $p < 0.01$). All subscales of the RSA were less positively but significantly correlated with the SOC ranging from 0.163 to 0.298. The highest positive correlation was between the personal competence subscale and SOC ($r = 0.298$, $p < 0.01$). Correlations between BDI and some subscales of the RSA were highly negative and significant, ranging from -0.341 to -0.555. The correlation between BDI and SOC was negative but not significant ($r = -0.127$). In the present study, item-total correlations varied from 0.345 (item 27) to 0.656 (item 22). After seeking permission from the original authors of the RSA, it was translated from English into Arabic using back translation method. The retaining of the original meaning of the items was guaranteed by two bi-lingual psychologists.

A decision was made to avoid the use of Likert scale response since recent work has suggested that a semantic differential format is recommended in measuring positive psychological constructs like resilience because it causes an increased cognitive demand. Additionally, the semantic format is preferable to Likert style as it is effective in dealing with the response acquiescence bias without violating the psychometric quality [21].

Investigators adopt semantic differential scaling technique because this type of scaling uses a series of bipolar adjectives to assess students' responses to the scale items. It offers a simple and accurate means of data collection because it gives participants good opportunities to make more fine-grained judgments. In semantic differential format, authors list the positive adjectives on the right and the negative adjectives on the left. For example, researchers may list the word "good" and

the word "bad" at opposite extremes. In doing so, respondents will be able to make easier judgments with less mental exhaustion. In other words, Osterburg-Kaufmann & Stadelmaier stated that "semantic differential analysis evaluates patterns of evaluation based on opposing conceptual pairs" (p.417).

### 4.1.2. Sense of Coherence Scale (SOC)

Sense of coherence was defined as a dynamic feeling of confidence incorporating three main components: comprehensibility, meaningfulness, and mindfulness [36, 37]. Several authors found that sense of coherence is associated with mental and physical health [38]. The SOC-13 scale consisted of three dimensions: Comprehensibility (items 2, 6, 8, 9, 11), Manageability (items 3, 5, 10, 13) and Meaningfulness (items 1, 4, 7, 12). The SOC is rated on a 7-point Likert scale. It is possible to use the total score of the scale. Concerning reliability, the Cronbach's alpha for an overall score was 0.80 [39]. The SOC has adequate construct, content and criterion validity [36]. Cronbach's alpha internal consistency of the scale was 0.77. Test re-test reliability was also computed (r = 0.66, p > 0.01). Criterion validity was ensured using the correlation between SOC-13 and Hardiness 45-item scale (r=0.54, p<0.01). Results of exploratory factor analysis indicated that the 4-factor structure fitted well in the Iranian University sample since the extracted dimensions accounted for more than 53% of the total variance [40]. In a review of more than 42 different studies in 14 different languages, the SOC was found to have different factor structures concluding that the one-factor structure was the fit and appropriate one. In contrast, Saravia, Iberico, & Yearwood [39] found that that a three factor solution was a better model fit for the Peruvian sample. Nevertheless, certain items did not perform properly and accurately. In the present study, item-total correlations varied from 0.344 (item 1) to 0.651 (item 5). Permission to use the Arabic version of the SOC scale was granted by the society for theory and research on Salutogenesis (STARS) through its official website.

Although the items (1, 2, 3, 7 and 10) were supposed to be reversed as recommended Saravia, Iberico, & Yearwood [39], the reverse worded items in scoring sense of coherence scale were avoided since recent findings have suggested that such items confuse respondents leading to fake multi-dimensionality and increase the acquiescence bias [41, 42].

### 4.1.3. Beck Depression Inventory (BDI)

The Arabic version of the Beck Depression Inventory was administered [43]. The translated version of BDI showed high reliability and adequate validity in four Arab countries. It consists of 21 items, each including four alternatives ranging from zero to three. The BDI has demonstrated test-retest and split-half reliability as well as concurrent validity with younger and older adults [44, 45]. The BDI was subjected to Rasch analysis and yielded perfect input and output fit indices except for only item 20. Item 20 was not included in the version used in this study since Sauer, Ziegler, and Schmitt [46] found that item 20 (*I have no interest in sex*) did not fit the fit indices of Rasch model. The exclusion of item 20 does not seem problematic because it does not debilitate the construct validity of the inventory. They justified its omission by the interpretation that sexual desire is mostly determined by several factors other than depression such as disturbance in marital satisfaction. Having convinced with their reasonable justification, item 20 was excluded in the present study and 19-items version was administered to the participants. In this study, item-total correlations varied from 0.313 (item 16) to 0.613 (item 4).

### 4.2. Participants

Using Convenience sampling technique, 150 students and adults were selected as a convenient sample to respond to the RSA, SOC and BDI. After the psychometric properties of the scales were obtained, 250 students and adults were contacted via google form link in the fall semester 2019 to respond to both the resilience scale and Beck depression inventory. Only 220 responses (response rate= 88%) were collected and utilized in the statistical analysis. The responses of 150 participants were used to ensure the psychometric conditions (validity and reliability) of the RSA; afterward the scale was administered on another different sample (220 participants) to perform the regression analysis. Regression needs a larger sample to give accurate results because small sample makes the model overfit the data. A detailed description of the two samples was reported in Table **1**.

**Table 1. Demographics of the study participants.**

| Demographics | | 150 Participants (Mean Age = 29.13 SD = 8.56) | | 220 Participants (Mean Age = 29.16 SD = 8.58) | |
|---|---|---|---|---|---|
| | | *N* | *%* | *N* | *%* |
| Gender | Males | 48 | 32% | 77 | 35% |
| | Females | 102 | 68% | 143 | 65% |
| Qualification | Bachelor | 135 | 90% | 193 | 87.7% |
| | High school | 10 | 6.7% | 18 | 8.2% |
| | No qualification | 5 | 3.3% | 9 | 4.1% |
| Work | Yes | 87 | 58% | 130 | 59.1% |
| | No | 63 | 42% | 90 | 40.9 |
| Experience | No experience | 48 | 32% | 69 | 31.4% |
| | 1-10 years | 57 | 38% | 77 | 35% |
| | 11-20 years | 38 | 25.3% | 66 | 30% |
| | 21-30 years | 7 | 4.7% | 8 | 3.6% |

### 4.3. Data Analysis

Descriptive statistics, correlations, Cronbach's Alpha, hierarchical regression analysis were conducted using SPSS version 23. Confirmatory factor analysis (CFA) was implemented using Amos 5.

## 5. RESULTS

### 5.1. Construct & Criterion Validity

The RSA was developed based on a strong theory and literature [3]. Authors of the original scale conducted Exploratory Factor Analysis (EFA), indicating that the scale has robust 5-factor structure. Authors of the original scale performed exploratory factor analysis so in the present study, CFA was deemed satisfactory to confirm the factorial structure of the scale in the Egyptian context. Results of the confirmatory factor analysis are reported in Table **2**.

### 5.1.1. Confirmatory Factor Analysis (CFA)

The findings of the confirmatory factor analysis revealed that the RSA retained the original 5-factor structure in the Egyptian sample.

### 5.2. Reliability of the Instruments

Means, standard deviations and correlations among all variables are reported in Tables **3-6**. All correlations with age and gender were small and insignificant except for the correlation between age and gender. (r = 0.335, P<0.01). As expected, the RSA total score was positively and significantly correlated with its subscales while they were negatively and significantly correlated with the total score of the Beck depression inventory.

**Table 2. The results of confirmatory factor analysis of the RSA, SOC and BDI (N = 150).**

| Scales | $\chi^2$ | DF | $\chi^2$ / DF | CFI | GFI | NFI | TLI | IFI | AGFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|
| RSA | 1.082 | 3 | .361 | 1.00 | .997 | .995 | 1.03 | 1.008 | .986 | .000 |
| SOC | 69.681 | 53 | 1.315 | .979 | .955 | .921 | .969 | .980 | .923 | .037 |
| BDI | 94.856 | 78 | 1.216 | .953 | .923 | .796 | .937 | .956 | .881 | .038 |

*Note: RSA* = resilience scale for adults, *SOC* = sense of coherence scale, *BDI* = Beck depression inventory.

*Abbreviations:* $\chi^2$ = Chi-squared, DF= degrees of freedom, CFI = comparative fit index, GFI = goodness of fit index, NFI = normed fit index, TLI = Tucker-Lewis index, IFI= incremental fit index, AGFI= adjusted goodness of fit index, RMSEA= root mean square error of approximation.

**Table 3. Alpha reliability coefficients for the RSA, SOC and BDI (N = 150).**

| Dimensions | No of items | Alpha α | Dimensions | No of items | Alpha α |
|---|---|---|---|---|---|
| PC | 10 | .872 | PS | 5 | .737 |
| SC | 7 | .894 | Total RSA | 37 | .919 |
| FC | 7 | .895 | SOC | 13 | .778 |
| SS | 8 | .788 | BDI | 19 | .658 |

*Abbreviations*: PC = personal competence, SC= social competence, FC = family coherence, SS= social support, PS = personal structure, RSA= resilience scale for adults, BDI = Beck depression inventory.

**Table 4. Correlations between the subscales of the RSA, SOC and BDI (N = 150).**

| Subscales | PC | SC | FC | SS | PS | Total RSA | SOC |
|---|---|---|---|---|---|---|---|
| PC | - | - | - | - | - | - | - |
| SC | 0.533** | - | - | - | - | - | - |
| FC | 0.466** | 0.366** | - | - | - | - | - |
| SS | 0.479** | 0.429 | 0.660** | - | - | - | - |
| PS | 0.631** | 0.322** | 0.473** | 0.683** | - | - | - |
| Total RSA | 0.825** | 0.692** | 0.770** | 0.827** | 0.765** | - | - |
| SOC | 0.298** | 0.169* | 0.255** | 0.166* | 0.260** | 0.242** | - |
| BDI | -0.538 | -0.341** | -0.555** | -0.514** | -0.484** | -0.629** | -0.127 |

**significant at 0.01 level *significant at 0.05 level.

**Table 5. Means, standard deviations and correlations for all measurement instruments (N = 220).**

| Dimensions | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 Gender | - | - | - | - | - | - | - | - | - | - |
| 2 Age | 29.17 | 8.58 | **.335** | - | - | - | - | - | - | - |
| 3 PC | 53.67 | 10.04 | .123 | .150 | - | - | - | - | - | - |

*(Table 5) contd.....*

| Dimensions | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 SC | 38.68 | 7.78 | .082 | **.133** | **.558** | - | - | - | - | - | - |
| 5 FC | 40.62 | 7.71 | .034 | -.020 | **.448** | **.333** | - | - | - | - | - |
| 6 SS | 46.04 | 7.20 | -.006 | .018 | **.524** | **.425** | **.641** | - | - | - | - |
| 7 PS | 26.64 | 4.92 | .071 | **.157** | **.662** | **.346** | **.436** | **.657** | - | - | - |
| 8 Total RSA | 205.65 | 29.30 | .084 | .112 | **.848** | **.706** | **.735** | **.817** | **.762** | - |
| 9 BDI | 26.27 | 9.29 | -.037 | .009 | **-.545** | **-.364** | **-.499** | **-.493** | **-.426** | **-.613** |

*Note*: Significant correlations are marked in bold. All Pearson correlation coefficients are significant at $p < 0.01$ while correlations$< .157$ are significant at $p < 0.02$.

*Abbreviations*: PC = personal competence, SC= social competence, FC = family coherence, SS= social support, PS = personal structure, RSA= resilience scale for adults, BDI = Beck Depression Inventory.

**Table 6. Summary of the separate hierarchical multiple regression analyses using depression as measured by BDI as the dependent variable (N = 220).**

| Step | - | F cha | $\Delta R^2$ | β | T |
|---|---|---|---|---|---|
| 1 | Gender | 0.299 | .001 | -.037 | -.547 |
| 2 | Age | 0.017 | .000 | .009 | .131 |
| 3 | Total RSA | 131.25** | .376 | -.613 | 11.46 |
| 3 | PC | 92.10** | .397 | -.545 | -18.60 |
| 3 | SC | 33.22** | .123 | -.364 | 5.76 |
| 3 | FC | 72.38** | .249 | -.499 | 8.51 |
| 3 | SS | 69.83** | .243 | -.493 | 8.36 |
| 3 | PS | 59.04** | .213 | -.462 | 7.68 |

*Note*: ** $p < 0.01$. The total score of the RSA and the sub-scales scores were included in separate analysis

*Abbreviations*: PC = personal competence, SC= social competence, FC = family coherence, SS= social support, PS = personal structure, RSA= Resilience Scale for Adults, BDI = Beck Depression Inventory.

## 5.3. Hierarchical Regression Models

Separate multiple hierarchical linear regression indicates that neither gender nor age contributed to the prediction of depression in the first and second steps. In the third step, the total score of the RSA and each of the subscales was separately entered to be treated as single predictors. The total score of the RSA and the scores of all subscales contributed significantly with range (.012 - .40) of the total variance explained.

Results of multiple hierarchical linear regression analysis are reported in Table **7**. In this analysis, all five factors of the RSA were entered simultaneously to detect the unique contribution of each dimension. Only two of the RSA factors significantly contributed to the variance explained, namely, Personal Competence (PC), and Family Coherence (FC).

The scores of the RSA subscales were entered into the regression analysis in steps. The RSA total score explained 39.5% in BDA when entered in the third step. Personal Competence (PC) was responsible for the greatest ratio in F change. PC explained 39.7% of the variance in BDI, Social Competence (SC) explained 12.3%, Family Coherence (FC) explained 24.9%, SS social support explained 24.3, Personal Structure (PS) explained 21.3%. The overall regression model predicted approximately 39.7% of the variance in BDI ($R^2 = .397$, $F(7.212)= 19.91$, $p<.001$).

It is obvious that R square change when controlling gender and age became .395. This means that roughly 40% of the variance in the dependent variables is explained by the RSA.

**Table 7. Summary of the hierarchical multiple regression analyses using depression measured by BDI as dependent variable (N = 220).**

| Step | - | F cha | $\Delta R^2$ | B | T |
|---|---|---|---|---|---|
| 1 | Gender | .299 | 0.01 | -.111 | -.100 |
| 2 | Age | .111 | 0.01 | .079 | 1.26 |
| 3 | Total RSA | 27.75** | .395 | -.296 | 3.91** |
| | PC | - | - | -.296 | 3.91** |
| | SC | - | - | -.053 | .669 |
| | FC | - | - | -.289 | 3.39** |
| | SS | - | - | -.138 | 1.26 |
| | PS | - | - | -.133 | -.846 |

*Note*: ** $p < 0.01$. In step 3 all RSA subscales were entered simultaneously in one model.

*Abbreviations*: PC = personal competence, SC= social competence, FC = family coherence, SS= social support, PS = personal structure, RSA= resilience scale for adults, BDI = Beck Depression Inventory.

We can see also that F change and ANOVA F were not significant in both models of gender and age while they were significant in the third model (p<.001).

The results of the correlation analysis show that there was a positive correlation between the sense of coherence scale and all the sub-dimensions of the Resilience Scale for Adults-Egyptian Version (*r ranged between 0.166 and 0.298, p < 0.01, 0.05*). Moreover, there was a negative correlation between the Beck depression inventory and the total score of the RSA and its subscales (*r ranged between -0.341 and -0.629, p < 0.01*).

## 6. DISCUSSION

This is the first study assessing the psychometric properties of the RSA among Egyptian adults. The factor structure of the RSA has been widely investigated in different cultures and the five-factor structure model was supported. The scale showed adequate properties in terms of internal consistency, construct validity and factor structure. These results can be applied to University students and among other adults because the sample was representative of college students and employees. The results of the correlation analysis indicated a positive correlation between the SOC and all the sub-dimensions of the RSA-Egyptian Version. Significant negative correlation between the BDI and the total score of the RSA and its subscales was detected as well, indicating the convergent validity of the RSA-Egyptian version.

To assess the internal consistency, Cronbach's alpha coefficients were computed for the total score and subscales of the RSA ( Table **3**). In addition, item-total correlations were greater than .30 in all items. The high values of reliability co-efficient of the RSA may be due to the fact that all items of the scale were understood by the Egyptian sample and that the protective factors implied in the statements of the items are practiced by the recruited sample.

The structural validity and criterion validity of the scale were computed to determine its validity. The construct validity of the RSA was confirmed by the significant negative correlation between Beck Depression Inventory and positive correlation with the Sense of Coherence Scale. Confirmatory factor analysis was performed for the 5-dimensions structure of the scale using scores of 150 College students. The results of the analysis revealed that the fit indices of the 5-factor structure of the scale were within acceptable limits. Taken together, all findings of the present study indicate that the Egyptian version of the resilience scale for adults has adequate psychometric properties concerning reliability and criterion & construct validity. The second objective of the present study was to examine the incremental validity of the RSA in predicting depression in 220 participants who were healthy college students. Findings of the separate hierarchical regression analysis indicated that the RSA is a significant predictor of depressive symptoms.

These results were higher than those from Iranian College students in which the reliability of the personal structure subscale was low [40]. The low internal consistency of the personal structure subscale might be attributed to the number of items (5 items) instead of inadequate reliability as suggested by [39]. The findings indicated that with the exception of two resilience factors, Personal Competence (t = 3.91, p<0.01) and Family Coherence (t = 3.39, p<0.01), (Total RSA, t = 3.91, p < .01), the rest of the RSA factors were insignificant predictors of depression (Social Competence, t = .669 p = n.s.; Social Support, t = 1.26, p = n.s; Personal Structure, t = −.846, p = n.s). This result highlights the vital roles of personal beliefs and strong bonds that should exist in the family, which in turn enable individuals to face stressful situations and help them get rid of depressive symptoms.

Findings of the present study are partially in line with the results reported by Hjemdal, Friborg, & Stiles, [47] which indicated that the RSA is a good predictor of hopelessness even when accounted for gender and age in the Norwegian sample. Similarly, resilience scale for adolescents was found to be a significant predictor of depressive symptoms and mental health [5].

Due to the sensitivity of $\chi^2$ to sample size, the ratio between $\chi^2$ and DF can be considered an alternative index of fit [48]. The values of $\chi^2$ / DF between 1 and 3 indicate a good fit [49, 50]. In the present study, the values of $\chi^2$ / DF were .361, 1.315 and 1.216 for the RSA, the SOC and the BDI, respectively. Relying on the aforementioned indicators, our CFA results reported in Table **2** reveal that the ratio of $\chi^2$ / DF in our analysis is within the acceptable limits. Concerning the RMSEA index, its standard range should be < 0.06 [51]. It is worth noting that RMESA takes into account the lack of fit of the empirical data to the model [17]. A seen in table **2**, RMSEA is lower than .04, and this is an excellent model data-fit. This result is in agreement with previous findings of exploratory and confirmatory analysis that yielded a five factor solution of the RSA [52, 53].

Neither gender nor age was found to be significant predictors of depression; this result is consistent with results of previous studies reported by [54], while only two factors of the RSA were significant predictors when all the RSA subscales were collectively entered into the analysis. This result is partially consistent with findings reported by Hjemdal, Friborg, & Stiles, [47] which revealed that the RSA is uniquely important for understanding hopelessness. This finding is satisfactory to the recommendation that the good measure of resilience should measure protective factors and be negatively correlated with measures of psychiatric symptoms like depression [5].

The RSA total score explained 37.6% of the total variance explained. Then each factor was entered separately and all factors were found to significantly predict depression. The strongest predictor of depression was personal competence explaining 37.7% of the variance. This result supports the findings reported by [5]. This factor consists of 10 items. A possible interpretation of this finding is that lack of personal competence probably leads to feelings of depression. Personal competence implies individual's beliefs in his abilities which help him/her to overcome difficulties and persist in the face of adversities and problems that may cause depression. In the present study, it was a successful procedure to use Beck depression inventory because the validity of the predictive findings was strengthened. This procedure was recommended by [47], indicating that Beck depression inventory is a more

specific and broader measure of affective symptoms than other scales such as the Hopkins Symptoms Check list–25 (HSCL-25) [55] and Beck Hopelessness Scale (BHS) [56].

The predictive significance of the family coherence subscale can be interpreted by the pivotal roles played by the family atmosphere in causing the depressive symptoms. This result is supported by the perspective presented by [57], indicating that "research on resilience and risk shows that families can function as direct or indirect influences on individuals' behaviors. Family characteristics can predict resilience (protective factors) or risk factor. (P. 396). According to the Encyclopedia of Educational Psychology, the depressed person may avoid social contact with others and suffer considerable emotional distress because of this isolation. (P. 160). This result is supported by the findings, which posited that 87.9% of the participants (*N* = 208) reported psychiatric distress; and that social support was a significant predictor of coping and resilience [58]. Thus, the dynamic role of family coherence and support distinguishes resilient from non-resilient adults. This result is consistent with the conclusion that resilience has a buffering effect against family stress [34]. On the other hand, this finding is contradictory with the findings reported by [35] which indicated that resilience does not have a protective or compensatory effect when there has been a high risky family.

Results of social competence subscale is partially in line with findings reported by Hjemdal, *et al.*, [5] who found that social competence was the weakest predictor of depression among other factors of the resilience scale for adolescents; then when social phobia anxiety omitted as a covariate, the social competence subscale explained 15% of the variance in depressive symptoms. Previous research confirmed that social support coming from strong family and peer relationships is essential factor to enable individual to overcome setbacks and protect him/her against adversities and stressful experiences [59, 60].

## 7. LIMITATIONS & FURTHER RESEARCH

Despite the good psychometric properties of the RSA, it is necessary to admit that the limited sample size (*N*=150) hinders the overgeneralization of the present findings. Further studies with a larger number of participants are required to re-examine the factor structure of the RSA in Egyptian setting. A possible trend of future studies is also needed to address the gender differences in resilience because this question is still unresolved in the present study. The incremental validity of the RSA should not be taken for granted due to the small sample size also. Another important reason for the lack of results generalizability is that the sample was dominated by females (*N* = 102, 68%). The use of self-report questionnaires imposes another limitation to our results. Due to the limitation that the study used healthy participants, other researchers ought to be cautious with regard to the power of the resilience construct to predict the depressive symptoms; moreover, it will be better if further studies examine resilience and depression among clinical samples of adolescents and adults. Findings of the present study highlight the significance of identifying the mechanisms that underlie the causal relationship between the

lack of resilience and the existence of depression symptoms. Besides, mechanisms that moderate the mediated paths between resilience and depression, such as personality traits or perceived quality of life are needed to be examined. "A large age range and gender are important elements in scientific research" [61], and "resilience may vary according to age and gender" [62 - 71], besides lack of age variety in the present sample, longitudinal studies are necessary to clarify to what extent resilience increase or decrease with age and across genders.

## CONCLUSION

In brief, The RSA turned out to be a valid and reliable instrument of protective resilience factors and a good predictor of depression in Egyptian University students. Since it demonstrated adequate psychometric properties and initial promising validity indicators, it could be used in further research examining individual differences in resilience.

## ETHICS APPROVAL AND CONSENT TO PARTI-CIPATE

This study was approved by the ethics committee of Minia Universiy, Egypt.

## HUMAN AND ANIMAL RIGHTS

Not applicable.

## CONSENT FOR PUBLICATION

Informed consent was obtained from all individual participants included in the study.

## AVAILABILITY OF DATA AND MATERIALS

The data and materials used to support the findings of this study are available from the corresponding author [M.A.K] upon reasonable request.

## FUNDING

None.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

## ACKNOWLEDGEMENTS

Declared none.

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