Examining the Psychometrics of the Connor-Davidson Resilience Scale (CD-RISC) among Medical Staff Members at the Faculty of Medicine, Suez Canal University, Egypt

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Abstract

Objectives: This study aims to investigate the level of Career Resilience among Medical Staff members and examine the psychometrics of the Connor-Davidson Resilience Scale (CD-RISC). **Subjects and Methods**: This is a descriptive, cross-sectional study; the study population included medical staff from basic and clinical departments at the Faculty Of Medicine, Suez Canal University (FOM-SCU) (n=75). The instrument was Connor-Davidson Resilience Scale (CD-RISC) to assess medical staffs' career resilience. **Results**: This study reveals that the medical staff at FOM-SCU agreed that things happen for a reason, past success gives them confidence for new challenge and, sometimes fate or God can help (78%, 72% and 72%, respectively). Ninety two percent of participants had a resilience score of ≥50%. Exploratory Factor Analysis (EFA) of the CD-RISC was conducted. This analysis yielded four factors. These factors were labeled as follows: Factor 1: Personal Competence, Factor 2: Tolerance of Negative Affect; Factor 3: Acceptance of change, secure relationships, and spiritual influences; and Factor 4: Control. **Conclusion**: The findings revealed that the medical staff received a high level of career resilience, and they especially felt that God gives them confidence. Resilience reveals how the medical staff copes with change and how they face challenges and risk events in the health profession. This study assessed the psychometric properties of the CD-RISC questionnaire and concluded that it is a reliable and valid instrument to measure career resilience in medical staff.

Keywords: Acceptance of Change, Personal Competence, Resilience, Reliability, Secure Relationships, Spiritual Influences, Validity

1. Background

There are multiple contextual factors as advanced technology, globalization, and changing workplace demographics have influenced careers in a variety of ways such as how we choose careers, how we approach and develop our careers, and how we evaluate our careers. As a consequence of this turbulence, persons are advised to be adaptive and resilient[1].

Resilience is defined as "the ability to bounce back from adversity, frustration, and misfortune" and it is essential for the effective leader[2]. Numerous researches reveal that there is a direct relationship between the stress of the medical staff in their job and their ability to preserve resilience in the face of prolonged contact with distress[3-6].

Studies on the resilience of individuals have extended to Career Resilience (CR). The concept of CR was initially presented by London (1983) who identified it as one of three domains comprising career motivation (the other

two are career identity and career insight). He defined it as "a person's resistance to career disruption in a less than optimal environment". According to London, there are three subdomains of CR: self-efficacy, risk taking, and dependency. Individuals with high self-efficacy, a readiness to take risks, and less dependency are possible to be career resilient[7].

Some professions have more potential to develop stressful conditions[8-10]. teaching-related professions are stressful careers due to workload and career features[11,12]. Faculty staff members experience extra pressures as they have various roles to play such as facilitator, role model, information provider, resource developer, planner and assessor[13]. There is a limited research to measure the level of resilience among medical staff. A heavy workload which may affect the resilience of these staff raises the need to answer the following research question: What is the level of career resilience among medical staff at the Faculty of Medicine, Suez Canal University (FOM-SCU)? This will provide information about participants" resilience and their

ability to cope to change and the impact of this on teaching students and patients care. In addition, the study will help identify factors that affect the resilience of the staff and to identify the strategies which will enhance the resilience.

2. Subjects and Methods

A cross sectional descriptive study was conducted to investigate the level of career resilience among medical staff.

The study population included medical staff from basic and clinical departments at FOM-SCU. The sample size was convenience (n=75). The response rate is 100%.

The sample size was convenience and calculated using the following formula: (10)
Where:

n = sample size

Zα/2 = 1.96 (The critical value that divides the central 95% of the Z distribution from the 5% in the tail)

P1 = Prevalence/proportion in the study group = 10% (11)

E = Margin of error/Width of confidence interval = 10%
So, by calculation, the sample size is equal to 35 staff members/each group.

2.1 Data Collection Tools

2.1.1 Connor-Davidson Resilience Scale (CD-RISC) to Assess Medical Staffs' Career Resilience

It is a brief self-rated instrument that measure resilience, which consists of 25 items on 5-point Likert scale from strongly disagree (0) to strongly agree (4)[14]. It has been translated into many languages across wide range of populations[15,16]. We used English language in the current study.

In the original study, Connor and Davidson (2003)[14] used a sample of 577 adults from the general population to perform exploratory factor analysis. This study produced four factors labeled as "personal competence, high standards, and tenacity; trust in one's instincts, tolerance of negative affect, and the strengthening effects of stress; positive acceptance of change and secure relationships with others; control and spiritual influences"[11]. An initial study of the psychometrics of the CD-RISC supported its test-retest reliability and internal consistency in general population and patient samples[12].

Several studies examine the psychometric properties of CD-RISC, assessing its validity and reliability. These studies documented that the scale has good psychometric properties (validity and reliability)[17-25] in the Western world. However, we have a little evidence of good psychometric properties in the Arabic and Islamic World, so we did the current study to have a validated tool in measuring resilience.

2.2 Data Analysis

Statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS®) version 25 software. Data were presented as frequencies of each item. Missing data were treated by replacing with a mean of missing variables. Exploratory Factor Analysis (EFA) was conducted using principal component analysis. We conducted EFA to reduce the number of items and to produce factors that are more appropriate in our context.

3. Ethical Considerations

All subjects in this research were informed about the purpose of the study and its relevance to the field of medical education. The data collection tools were anonymous. The research received approval from the Ethics Research Committee at FOM-SCU.

4. Results

Seventy-five faculty staff members were enrolled in the study. Age and gender of participants are shown in Table 1.

Number of working hours per day and years of experience are shown in Table 2. On average study participants work for 7.4 ± 3.5 hours per day ranging from (4 – 24 hours) and mean work experience was 6.9 ± 5.9 years ranging from (1 – 23 years).

Table 1. Age and gender of participants

Character	No.	Percent (%)
Age in years		
20 – 35	59	78.7%
> 35	16	21.3%
Gender		
Male	18	24%
Female	57	76%

Table 2. Occupational data among study participants

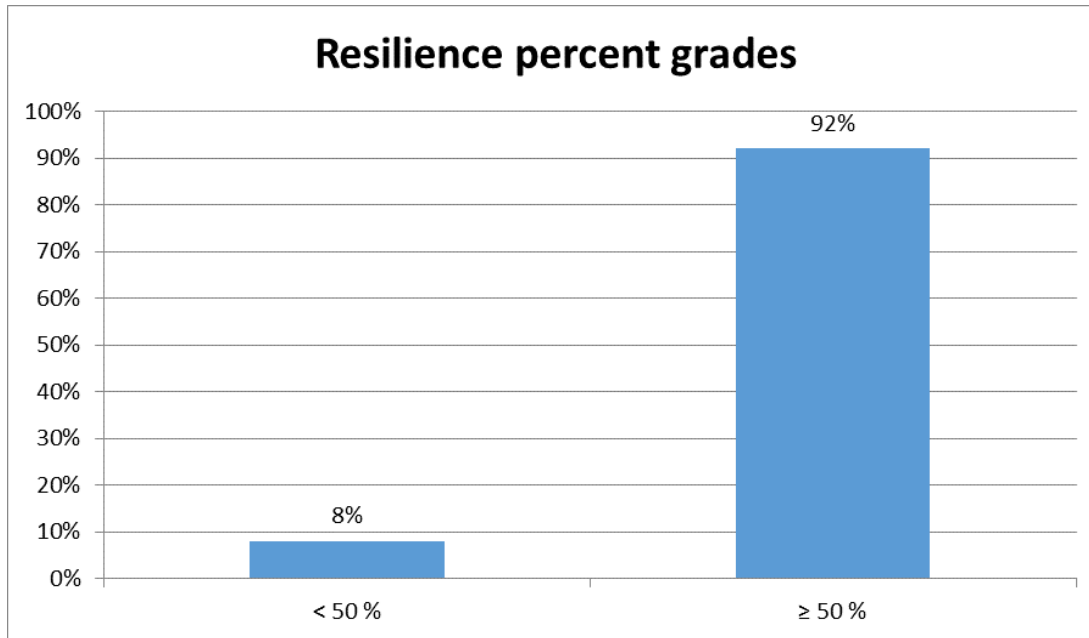| Occupational data	Mean ± SD	Median (range)
No. of working hours/day	7.4±3.5	6 (4–24)
Years of working experience	6.9±5.9	5 (1–23)

Figure 1. Distribution of resilience percent among study participants.

Ninety-two percent of medical staff members had a resilience score of ≥50% as shown in Figure 1.

Testing the psychometric properties of CD-RISC, through EFA and reliability analysis:

The correlation matrix reveals statistically significant, moderate correlations among the observed variables used in the analysis. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.83. Furthermore, Bartlett's test of sphericity was statistically significant (P<0.001).

The principal component analysis with varimax rotation was performed. The results revealed that the 25 items of the scale resulted in 4 factors (Table 3) with an eigenvalue >1.00. The 4 factors that emerged from the factor analysis accounted for 55.8% of the total variance. These results indicate that CD-RISC has good structure validity.

The four factors are labeled as follows: Factor 1: Personal Competence; Factor 2: Tolerance of Negative Affect; Factor 3: Acceptance of change, and secure relationships and spiritual influences; and Factor 4: Control. Factor 3 and 4 were modified in the current study.

The overall Cronbach's alpha for the total CD-RISC items was 0.922. This result indicates high internal consistency (reliability).

Table 4 shows that most of medical staff members at FOM-SCU agreed that they work to attain their goals, make their best effort, no matter what and able to adapt to change (69.3%, 66% and 65.3%, respectively). Furthermore, 16% of the participants emphasized that they cannot focus and think clearly under pressure.

Table 5 shows 56% of faculty staff members believed that coping with stress can make them stronger. Furthermore, 49.3%

of them emphasized that they are able to handle unpleasant or painful feelings like sadness, fear, and anger.

Table 6 shows that most of medical staff members at FOM-SCU agreed that things happen for a reason, past success gives them confidence for new challenge and Sometimes fate or God can help (78%, and 72%, respectively).

Table 7 shows that 54.7% of medical staff members at FOM-SCU believed that even when hopeless, they do not give up. Also, 52% of participants emphasized that they have a strong sense of purpose in life.

5. Discussion

We performed in our study EFA of the CD-RISC. This analysis yielded four factors. The four factors were labeled as follows: Factor 1: Personal Competence, Factor 2: Tolerance of Negative Affect; Factor 3: Acceptance of change, secure relationships, and spiritual influences; and Factor 4: Control.

The findings revealed that the medical staff received a high level of career resilience. They especially felt that God gives them confidence, and things happen for a reason. They believed also that past success gives confidence for new challenge, and they worked to attain their own goals. Areas for improvements are related to working under pressure and making serous decisions. It was highlighted by Grote (2012)[26] that for most clinicians in training, the challenge to career resilience comes not so much from personal conditions, but from the more common experiences of coping with night shifts, exams, and annual evaluations of competence progression and negotiating the obstacles of specialty training applications[26]. All these factors are related to decision making and work pressures.

Table 3. Factor structure of CD-RISC, using principal components analysis

Items	1	2	3	4	New Factor labeling
23- I like challenges	.797				F1: Personal Competence
1-Able to adapt to change	.766				
17-Think of self as strong person	.759				
22- In control of your life	.707				
24- You work to attain your goals	.705				
4-Can deal with whatever comes	.589				
10- Best effort no matter what	.582				
14- Under pressure, focus and think clearly	.541				
11- You can achieve your goals	.372				
25- Pride in your achievements	.365				
16- Not easily discouraged by failure	.343				
8- Tend to bounce back after illness or hardship		.736			F2: Tolerance of Negative Affect
18- Make unpopular or difficult decisions		.567			
15- Prefer to take the lead in problem solving		.567			
6- See the humorous side of things		.557			
19-Can handle unpleasant feelings		.406			
7- Coping with stress strengthens		.376			
9- Things happen for a reason			.821		F3: Acceptance of change, secure relationships and spiritual influences
5- Past success gives confidence for new challenge			.642		
3-Sometimes fate or God can help			.621		
2-Close and secure relationships			.415		
20- Have to act on a hunch				.694	F4: Control
12- When things look hopeless, I don't give up				.649	
21- Strong sense of purpose				.572	
13- Know where to turn for help				.530	

Table 4. faculty staff members' perceptions of their career resilience (regarding factor1: Personal Competence)

Items	Disagree	Neutral	Agree
I like challenges	12%	33.3%	54.7%
Able to adapt to change	10.7%	24%	65.3%
Think of self as strong person	14.7%	40%	45.3%
In control of your life	9.3%	42.7%	48%
You work to attain your goals	4%	26.7%	69.3%
Can deal with whatever comes	6.7%	40%	53.3%
Best effort no matter what	8%	32%	60%
Under pressure, focus and think clearly	16%	46.7%	37.3%
You can achieve your goals	5.3%	33.3%	61.3%
Pride in your achievements	5.3%	32%	62%
Not easily discouraged by failure	18.7%	33.3%	48%

Table 5. Faculty staff members' perceptions of their career resilience (regarding factor 2: Tolerance of Negative Affect)

Items	Disagree	Neutral	Agree
Tend to bounce back after illness or hardship	20%	32%	48%
Make unpopular or difficult decisions	24%	41.3%	34.7%
Prefer to take the lead in problem solving	16%	44%	40%
See the humorous side of things	9.3%	38.7%	52%
Can handle unpleasant feelings	16%	34.7%	49.3%
Coping with stress strengthens	12%	32%	56%

Table 6. Faculty staff members' perceptions of their career resilience (regarding factor 3: Acceptance of change, secure relationships and spiritual influences)

Items	Disagree	Neutral	Agree
Things happen for a reason	4%	18%	78%
Past success gives confidence for new challenge	4%	24%	72%
Sometimes fate or God can help	5.3%	22.7%	72%
Close and secure relationships	6.7%	40%	53.3%

Table 7. Faculty staff members' perceptions of their career resilience (regarding factor 4: Control)

Items	Disagree	Neutral	Agree
Have to act on a hunch	12%	45.3%	42.7%
When things look hopeless, I don't give up	10.7%	34.7%	54.7%
Strong sense of purpose	8%	40%	52%
Know where to turn for help	13.3%	38.7%	48%

In our study, Factor 1 was identified as Personal Competence, and it was represented by 11 items in the questionnaire. This factor included 9 items from the original Factor 1 in addition to Items 1 ("Able to adapt to change") and 4 ("Can deal with whatever comes"), and 22 (In control of your life).

This indicates that resilient Egyptian Medical staff incorporates change adaptation behavior, commitment, and life-control when they are facing challenges, unanticipated events or situations of uncertainty, disappointment, and obstacles.

In the Spanish and Korean versions of the questionnaire Factor 1 was identified as Hardiness and include the same shared 9 items[19,27].

Factor 2 was identified as Tolerance of Negative Affect and included five items from the original Factor 2, one item (8) from the original Factor 3. It suggests that resilient medical staff members are capable to make unpopular or difficult decisions. They tolerate negative affects by preferring to take the lead in problem solving and seeing the humorous side of things. Also,

they can handle unpleasant feelings and thus cope with stress which can strengthen their capabilities.

In Factor 3 most of the items refer to the Acceptance of change, secure relationships and spiritual influences.It incorporates both factor 3 and 5 (Spirituality) in the original questionnaire. This factor reflects the positive attitude of the medical staff in the face of harmful situations and risk events. In addition, the spirituality plays an important role in the acceptance of change by the medical staff in our context.

It is noticed that item 9 ("Things happen for a reason") was loaded in F3, which were also implied in Factor 3 (Optimism) of the Korean version of the CD-RISC[19].

A difference found in this study when applying the CD-RISC is that Item 3 ("Sometimes fate or God can help"), which load on Factor 5 (Spirituality) of the original structure, succeeded to load higher than 0.6 onto factor 3. The reasons behind this are probably related to the fact that resilient medical staff believed on God and fate as well as their behaviors and capabilities. This is related to their culture and religious background. This

result incompatible with those of Manzano-García and Calvo in whose studies the factor of spirituality does not emerge[27]. Whereas item 3 in Korean version was not loaded in any factor because many Korean subjects interpreted item 3 as a question about luck, chance, or things out of their control, so is may have not reflected spiritual influence from their perspectives[19].

As regards factor 4, medical staff members at FOM-SCU believed that they do not give up even they feel hopeless. Also, they have a strong sense of purpose which helps in controlling their life. These findings are in line with the studies of Jeong (2015)[19] and Manzano-García and Calvo (2013)[27] on Korean and Spanish peaople and they identified this factor as (Optimism)[19,27].

One modest contribution this study makes is to illustrate that acceptance of change, secure relationships and spiritual influences positive attitude are relative factors in staff's resilience, despite their distinctiveness.

The overall Cronbach's alpha for the total CD-RISC items was 0.922. This result indicates high internal consistency (reliability). The scale was also demonstrated to have good internal consistency (Cronbach's alpha = 0.91) in another study by using the Chinese version of the 10-item CD-RISC[15].

6. Limitations of the Study

First, generalizability of the results may be jeopardized because of the small sample and data collection from one faculty. Further studies should be conducted to include a larger sample and more settings. Second, more validation studies should be conducted to produce stronger evidence, for example correlation studies.

7. Conclusion

This study is important as it investigated dimensions of the career resilience in our context. Resilience reveals how the medical staff members cope with change and how they face challenges and risk events in the health profession. The findings revealed that the medical staff received a high level of career resilience, they especially felt that God gives them confidence.

So, we need a tool to assess of the career resilience among Egyptian staff. We assessed the psychometric properties of the CD-RISC questionnaire and concluded that it is a reliable and valid instrument to measure career resilience in medical staff.

8. References

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