

ARTICLE INFO

Submitted: 16-2-2020

Accepted: 16-3-2020

Online: 30-06-2020

Reframing Resilience Concept: Insights from a Meta-synthesis of 21 Resilience Scales

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To cite this article: Wadi MM, Nordin NI, Roslan NS, Celina T, Yusoff MSB. Reframing resilience concept: insights from a meta-synthesis of 21 resilience scales. *Education in Medicine Journal*. 2020;12(2):3–22. <https://doi.org/10.21315/eimj2020.12.2.2>

To link to this article: <https://doi.org/10.21315/eimj2020.12.2.2>

ABSTRACT

In general context, resilience refers to individuals' ability to adapt to significant adversities while maintaining good mental and physical well-being. Over the past three decades, resilience paradigm has evolved from a stable trait-oriented approach to process-oriented or outcome-oriented approach. However, robustness of resilience conceptualisation is still scant. Review of the common characteristics of resilience across validated resilience scales were conducted. Several databases were searched, and several keywords were used. Articles that fulfill the predetermined criteria were selected. Twenty-one original articles describing resilience were selected. A thematic approach was performed to categorise common patterns or characteristics shared across the scales that later form emerging constructs representing resilience. Constructs were grouped according to similar attributes, elements, and themes underlying resilience. Four emerging themes were identified; control, resourceful, growth, and involvement. The constructs from the 21 selected scales were mapped against the four emerging themes. Additionally, they are marked as either as exclusive or shared constructs. The relationship between the four emerging themes were determined considering two continuums (present and past) and two conditions (internal and external). Hence, the integrated resilience model was proposed to conceptualise the relationships of the four emerging resilience themes. The integrated resilience model is a promising model that can be used for different practical implications. It can be used to build new measurement scale, nurturing resilience in medical and health professions education and infusing resilience in the assessment practice.

Keywords: *Resilience, Burnout, Well-being, Health profession education, Medical education, Resilience scales*

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INTRODUCTION

“Of all the virtues we can learn, no trait is more useful, more essential for survival, and more likely to improve the quality of life than the ability to transform adversity into an enjoyable challenge”, Mihaly Csikszentmihalyi (1).

From this notion, resilience in general context refers to individuals' ability to adapt to significant adversities while maintaining good mental and physical well-being (2). There are different definitions and conceptualisations of resilience (3–5). In general, resilience is a person's ability

to cope and deal with adversity effectively and positively, thus improving the person's well-being (3–8).

Over the past three decades, resilience paradigm has evolved from a stable trait-oriented approach to process-oriented or outcome-oriented approach (9). It has been viewed as amenable (10) and could be partially predicted by several unique factors depending on the resilience contexts. These factors can be broadly categorised into demographic variables such as gender, and psychological variables such as depression (risk factors) and support (protective factor). However, no single predictor has been identified to impose dominant influence on resilience formation (11). Therefore, the view of resilience as a stable trait has become less accepted as it does not acknowledge the interaction between individuals, environment and faced adversities (4). The evolving understanding of resilience has also led to the term used interchangeably with hardiness, mental toughness, grit and retention (12). Despite this overlapping, various literature has concluded that resilience is not mere toughness, but also characterised by dynamic process of effective negotiation, adaptation and management of stressors (5, 13).

Resilience becomes a topic of interest in many sciences (3, 14) and has been studied under several areas such as developmental psychology, sociology, trauma, and medical education (15–18). Under the spectrum of healthcare professionals (HCP), it has additional concern due to the nature of the health professions workers where they are expected to promote the physical and mental health and well-being of others. Therefore, resilience is a critical attribute for them (19–20).

Modern HCP are faced with many stressors such as rising patient expectations, workforce shortage, clerical and bureaucracy demands, fear of making errors, practice

litigation and poor reward system (12, 21–22). Over the recent years, there has been an increasing amount of literature reporting a high prevalence of burnout (17% to 86%) among HCP (21, 23–25). To alleviate burnout syndrome among HCP, outlined strategies were not limited in reducing stressful stimuli. The postmodernist movement has also focused on building HCP capacity to cope with adversities such as in resiliency training (18–26). The latter strategies were supported by some evidence on its protective role against burnout and this has resulted in increased interest in resilience (27–28).

A meta-analysis by Leppin and colleagues revealed the lack of a unified view and consensus in resilience (13). Even with this concern, growing studies in HCP context have shown positive association between resilience and compassion satisfaction, patient care, and negative associations between resilience and burnout, secondary stress, anxiety, intolerance to ambiguity and communication (29). Despite the evidence on the lack of framework to guide intervention, many health institutions have still adopted or institute their own resilience interventions (27, 30). Common intervention strategies include psychosocial skills training, mindfulness, Stress Management and Resiliency Training (SMART), narrative and simulation training (31–34). These interventions have been shown effective with moderate positive effect (10). At the training level, more educational institutions have focused on resilience as part of essential competencies in producing work-ready candidates or trainees (35–36). The trends towards competency-based medical education have also led to resilience being considered as part of the assessment domain in medical training and even earlier in the student selection process (37). This calls for a solid understanding of the resilience concept in HCP context to ensure theoretical rationale in guiding education and intervention, and construct validity in assessment measurement.

Although a number of scales have been developed for measuring resilience, they are not widely adopted and no scale is preferable over the others (38). Consequently, researchers and clinicians have little evidence to inform their choice of resilience measurement and may make an arbitrary and inappropriate selection for the population and context. Methodological reviews aim to identify, compare and critically assess the validity and psychometric properties of conceptually similar scales, and make recommendations about the most appropriate use for a specific population, intervention, and outcome. Fundamental to the robustness of a methodological review is the quality criteria used to distinguish the measurement properties of a scale to enable a meaningful comparison (39).

There is a scant review on resilience measurement scales. An earlier review of instruments measuring resilience compared the psychometric properties and appropriateness of six scales for the study of resilience in adolescents (40). Another review was done by Windle et al. (38), in which 15 resilience scales were evaluated against strong quality criteria to assess validity and reliability, however, the conceptual framework of resilience is not adequately addressed.

The common resilience scales used in HCP studies include the Brief Resilient Coping Scale (BRCS) and the Connor-Davidson Resilience Scale (CD-RISC) (36). However, it is interesting to note that none of these scales were explicitly developed for HCP context (24, 33, 37).

We would wonder how robust resilience had been conceptualised to measure attributes that reflect the resilience concept. Given the increasing interest in resilience from various stakeholders, this article provides a new conceptual framework for a brief update on the emerging constructs of resilience based on a meta-synthesis of 21 selected resilience scales and identified several

practical implications in the measurement of resilience in medical and health professions education.

METHODS

We conducted a review of the common characteristics of resilience across validated resilience scales. Several databases namely PubMed, CINAHL, PsycINFO and Google Scholar were searched to identify the original articles describing resilience measurements. Several keywords were used for advanced search such as [resilience or mental toughness or grit or hardiness or buoyancy] AND [scales or questionnaire or measurements]. Articles that fulfill the following criteria were selected: (i) articles published in peer-reviewed medium, (ii) using English language, (iii) non-review articles, (iv) provide construct(s) of resilience measured by the scale/questionnaire, and (v) full article accessible. The selection of papers was appraised by title, abstract and full text prior to the extraction of relevant information. In addition, the selection of papers was appraised based on the authors' experience and judgement. Relevant information was tabulated in a narrative synthesis table that includes scale, authors, year, domain and context (Table 1). A thematic approach was performed to categorise common patterns or characteristics shared across the scales that later form emerging constructs representing resilience.

RESULTS

Twenty-seven resilience scales were identified as summarised in Table 1. Out of 27, only 21 scales were selected whose constructs of resilience are being measured in the report. Table 1 shows the resilience scales that were used in general context and in specific contexts such as academics, patients, workplace settings, and with different age groups spanning from children (12 years old) to older adults (45 years old

Table 1: The measured constructs by the identified resilience scales

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
1.	53 item Hardiness Scale	Kobasa et al. (1982) (41)	53 items with 3 constructs: 1. Commitment 2. Control 3. Challenge	It was developed for an assemblage of personality features as a resistance resource in front of stressful adversities of life.
2.	Dispositional Resilience Scale-30	Bartone, Ursano, Wright, and Ingraham (1989) (42)	30 items with 3 domains: 1. Commitment 2. Control 3. Challenge	As above
3.	Cognitive Hardiness Scale	Nowack (1990) (43)	30 items with 3 domains: 1. Involvement 2. Challenge 3. Control	It was developed for professional employees to assess specific attitudes and beliefs based on the concept of personality hardiness attributed to Kobasa and her colleagues (41). It is composed of attitudes and beliefs about work and life that are relatively enduring from day-to-day.
4.	Resilience Scale (RS-25) / The Resilience Scale (RS)	Wagnild and Young (1993) (44)	25 items with 2 domains: 1. Personal competence 2. Acceptance of self & life	It was developed for adolescents, younger and older adults to identify the degree of individual resilience (personal competence and acceptance of self and life); a positive personality characteristic that enhances individual adaptation. The scale is an individual-level measure and was developed from qualitative research. Five themes were derived; equanimity, perseverance, self-reliance, meaningfulness, existential aloneness, but further validated and concluded into two main domains. However, it is unclear how they came to this conclusion.
5.	Dispositional Resilience Scale (DRS)	Bartone (1995) (45)	45 items with 3 domains: 1. Commitment 2. Control 3. Challenge	It was developed based on psychological hardiness literature. It assessed resilience as an individual response as a fixed trait, however, it is not fit well with the notion of resilience as a dynamic process.
6.	General Self-Efficacy Scale (GSE)	Jerusalem and Schwarzer (1995) (46)	10 items with one domain; perceived self-efficacy	Developed for general adolescence and adult population above 12 years old to assess the range of an individual's belief in his or her own ability to respond to novel or difficult situations and to deal with any associated obstacles or impediments
7.	Ego-Resiliency Scale-14 (ERS-14)	Block and Kremen (1996) (47)	14 items with one domain; ego-Resiliency (stable personality characteristic)	It was developed to assess resilience in adolescents and early adults. It was derived from various studies and scales on resilience used in non-psychiatric contexts.

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Table 1 (Continued)

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
8.	Ego-Resiliency	Klohnem (1996) (48)	20 items with 4 domains: 1. Confident optimism 2. Productive & autonomous activity 3. Interpersonal warmth & insight 4. Skilled expressiveness	It was derived from Block and Kremen's ego resiliency theory on ego-resiliency (47) and the items were drawn from existing data - the California Psychological Inventory (49). It used for adults (ages 18–48).
9.	Resiliency Attitude & Skills Profile (RASP)	Hurtes and Allen (2001) (50)	34 items with 7 domains: 1. Insight 2. Independent 3. Creativity 4. Humour 5. Initiative 6. Relationships 7. Values orientation	It was based on Wolin and Wolin (51) work. It was used for youth (ages 12–19).
10.	MTQ48	Clough, Earle, and Sewell (2002) (52)	48 items with 4 domains: 1. Commitment 2. Challenge 3. Confidence 4. Control	Originally developed for sport sciences – mental toughness. The constructs are based on the 4Cs model (challenge, commitment, confidence, and control).
11.	CD-RISC-25	Connor and Davidson (2003) (53)	25 items with 5 domains: 1. Personal competence/high standard/tenacity 2. Trust in one instinct/tolerance of negative effect/strengthening effect of stress 3. Positive acceptance of change/ secured relationships 4. Control 5. Spiritual influence	The content of the scale was drawn from a number of sources. From Kobasa's work with the construct of hardiness (54), items reflecting control, commitment, and change viewed as challenges were included. The following features were drawn from Rutter's work (55): developing strategy with a clear goal or aim, action orientation, strong self-esteem/confidence, adaptability when coping with change, social problem solving skills, humor in the face of stress, strengthening effect of stress, taking on responsibilities for dealing with stress, secure/stable affectional bonds, and previous experiences of success and achievement (these last two features may reflect the underpinnings of resilience). From Lyons (56), items assessing patience and the ability to endure stress or pain were included. Lastly, from Shackleton's experience (57), it was noted that the role of faith and a belief in benevolent intervention ("good luck") were likely important factors in the survival of the expedition, suggesting a spiritual component to resilience. It was developed for community samples, GP patients, anxiety, and PTSD.

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Table 1 (Continued)

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
12.	Resilience Scale for Adult (RSA)	Friborg, Hjemdal, Rosenvinge, and Martinussen (2003) (58)	37 items with 5 domains: 1. Personal competence 2. Social competence 3. Family coherence 4. Social support 5. Personal structure	The authors outline evidence from longitudinal research to identify some of the key features of resilient people. These are presented as family support and cohesion, external support systems and dispositional attitudes and behaviors. These were used to define questionnaire items, but it is not clear how the wording for the items was chosen, or whether the target population was involved in item selection. The multi-level nature of the questionnaire is consistent with the assets and resources outlined in our definition. It is used for adults (mean age women = 33.7, men = 36.2)
13.	Adolescent Resilience Scale (ARS)	Oshio, Kaneko, Nagamine, and Nakaya (2003) (59)	21 items with 3 domains: 1. Novelty seeking 2. Emotional regulation 3. Positive future & orientation	Very little theoretical rationale is presented, and it is unclear as to how the psychological characteristics were chosen to represent resilience. It was developed for youth.
14.	Brief Resilience Coping Scale (BRCS)	Sinclair and Wallston (2004) (60)	4 items with 1 domain; resilience	Developed items are those which can be amenable by a cognitive-behavioral intervention that focuses on adaptive coping and control over stressful condition. It was developed for rheumatoid arthritis patients.
15.	Resilience Scale for Adolescent (READ)	Hjemdal, Friborg, Stiles, Martinussen, and Rosenvinge (2006) (61)	39 items with 5 domains: 1. Personal competence 2. Social competence 3. Structured style 4. Family cohesion 5. Social resources	It was based on a content analysis of resilience factors, the authors concluded RSA satisfied the higher-order aspects of resilience. Items were adapted from RSA. It was used for early adolescence 13–15 years old.
16.	Ego-Resiliency	Bromley, Johnson, and Cohen (2006) (62)	102 items with 4 domains: 1. Confident optimism 2. Productive & autonomous activity 3. Interpersonal warmth & insight 4. Skilled Expressiveness	It was derived from secondary data analysis and Block and Block's ego resiliency theory and existing scale - California Psychological Inventory. It was used for adolescents and early adults.

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Table 1 (Continued)

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
17.	CD-RISC-10	Campbell-Sills and Stein (2007) (63)	10 items with 1 domain; resilience	The authors take the perspective that resilience is a personal quality that reflects the ability to cope with stress. In their scale development, the attempt to identify attributes of resilience is not covered in much depth, and it is not clear why only the work of the three authors cited (Kobasa, Rutter, Lyons) are chosen to identify the characteristics of resilient people. Likewise, the authors make a brief reference to Shackleton's expedition to the arctic, noting that he possessed "personal characteristics compatible with resilience". Research from other authors could potentially have added items to this list. Although this scale was one of the higher scoring ones in the psychometric evaluation and has been applied with an intervention, with reference to our definition, it is an individual-level measure that would benefit from more theoretical clarification.
18.	Dispositional Resilience Scale-15	Bartone (2007) (64)	15 items with 3 domains: 1. Commitment 2. Control 3. Challenge	As above
19.	California Healthy Kids Survey – The Resilience of the Student	Sun and Stewart (2007) (65)	34 items with 12 characteristics/factors: 1. Communication & Cooperation 2. Self-esteem 3. Empathy 4. Problem-solving 5. Goals & aspiration 6. Family connection 7. School connection 8. Community connection 9. Autonomy experience 10. Pro-social peers 11. Meaningful participation in community activity 12. Peer support	The authors discussed resilience in relation to Salutogenesis, emphasizing the enhancement of protective factors. The authors also discuss resilience within an ecological framework, acknowledging the interactions between the individual, their social environment and the wider community. They acknowledge that resilience encompasses the individual characteristics of the child, family structures and the external environment, and these multiple levels are reflected in the items of the Resilience Scale. The authors also identified peer support at school as an important factor and also added the Peer Support Scale derived from the Perception of Peer Support Scale (66).

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Table 1 (Continued)

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
20.	Youth Resiliency: Assessing Developmental Strengths (YR: ADS)	Donnon and Hammond (2007) (67)	94 items with 10 domains/factors: 1. Family 2. Community 3. Peers 4. Work commitment & learning 5. School or culture 6. Social sensitivity 7. Cultural sensitivity 8. Self-concept 9. Empowerment 10. Self-control	The 10-factor model of youth resiliency based on a framework of both intrinsic and extrinsic factors. Appears to have been developed to generate profiles, and not assess change over time. The authors summarise the literature with a focus on protective factors and note that youth resiliency is influenced by personal attributes, family characteristics and other external support systems such as peers, the school and the community. In turn, these are described as intrinsic and extrinsic developmental strengths that are related to the development of resiliency. The items representing the protective factors were primarily drawn and formulated from the literature on resiliency, protective factors, prevention and child and adolescent development. The dimensions are outlined but the questionnaire is not in the public domain. It was developed for youths (aged 12–17).
21.	Brief Resilience Scale	Smith et al. (2008) (68)	6 items with 1 domain; resiliency	The authors note that most measures of resiliency have focused on examining the resources/protective factors that might facilitate a resilient outcome. This scale was developed to have a specific focus on bouncing back from stress. Their arguments are short but clear. They say that they selected the final items from a list of potential items but do not identify the full list. The data reduction appears to be based on feedback and piloting of the original list; no empirical validation of the data reduction is reported. In relation to our definition, this scale could be a useful outcome measure in the context of stress. It was developed for UG students, cardiac rehab patients, and chronic pain patients.

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Table 1 (Continued)

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
22.	Child & Youth Resilience Measure (CYRM)	Ungar et al. (2008) (69)	28 items with 4 domains: 1. Individual 2. Relational 3. Community 4. Culture	The authors do not cite some of the early literature on resilience but use a definition of their own from previous work to highlight that resilience is a dynamic interplay between the individual and available resources. This interplay involves a process of navigation and negotiation between the individual, their families, and the community. They note some of the difficulties in identifying a 'standard' measure of resilience across different cultures and contexts. The project appears to have put a lot of work into the development of the measure, and work was undertaken within 11 countries. The target population was involved in the questionnaire development - at focus groups in nine countries the youths assisted with the development of the questions related to the domains defined in previous theoretical work. It appears that the authors have yet to present findings for further application and validation. It was developed for children and youths.
23.	Psychological Resilience	Gill Windle, Markland, and Woods (2008) (70)	19 items with 3 domains: 1. Self-esteem 2. Personal competence 3. Interpersonal control	The measure was developed through secondary data analysis to provide a model of psychological resilience. The literature review in the introduction makes a good case for the respective psychological resources to be considered as indicators of resilience. These are tested and validated empirically. As these items are from established scales with strong underpinning theory that have been applied across populations from adolescents upwards, the measure has the potential to generalize. As yet it has only been used with people aged 50+. In relation to our definition, it is an individual-level measure. It was developed for older Adults (subscales previously used with adolescents).
24.	Resilience in Mid-Life Scale (RIM)	Linda and Caltabiano (2009) (71)	25 items with 5 domains: 1. Self-efficacy 2. Perseverance 3. Internal locus of control 4. Coping & adaptation 5. Family & social network	It was built from a comprehensive literature review that revealed five common themes. It was used for mid-life (35–60 years).

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Table 1 (Continued)

No	Resilience Scales	Author(s) (year)	Items and Constructs	Context
25.	Resilience Scale for Adolescent (READ)	von Soest, Mossige, Stefansen, and Hjemdal (2010) (72)	123 items with 5 domains: 1. Personal competence 2. Social competence 3. Structured style 4. Family cohesion 5. Social resources	It was based on a content analysis of resilience factors, the authors concluded RSA satisfied the higher-order aspects of resilience. Items were adapted from RSA. It was developed for adolescents (Early adolescence 13–15 years old).
26.	Resilience Scale-14 (RS-14)	Damáσιο, Borsari, and da Silva (2011) (73)	14 items with 1 domain; resilience	The measure was based on the previous scale (58). The literature review in the introduction makes a good case for the respective psychological resources to be considered as indicators of resilience. However, very little theoretical rationale is presented. It was developed for youngsters and teachers.
27.	Predictive Six-factor Resilience Scale	Rossouw and Rossouw (2016) (74)	16 items with 6 domains: 1. Vision, self-efficacy & goal-setting 2. Composure 3. Tenacity 4. Reasoning 5. Collaboration 6. Health	

and above). Most scales were developed based on sound theoretical foundations specifically 4C model (commitment, challenge, confidence, control). We then undertook a thematic analysis of the identified resilience constructs, where only constructs that we perceived as relevant to resilience from each measurement tool are selected for our thematic analysis. We grouped constructs according to similar attributes. From this, we define each group that captured all relevant aspects as a newly emerging theme. We then discussed any construct of difference and agreed upon consensus, the elements, and themes underlying resilience. Based on thematic analysis of the constructs from 21 scales, four emerging themes were

identified which are control, resourceful, growth, and involvement (Table 2). The mapping of 21 selected scales and the four emerging themes were summarised in Table 3.

Table 2 describes the four emerging themes (control, resourceful, growth, involvement) derived from the constructs of 21 selected scales. There are two forms of constructs namely exclusive constructs/attributes and shared constructs/attributes. The exclusive attributes are referred to as those constructs that are limited to only one particular theme, in which the definition and application of the construct as provided by the original articles of respective resilience measurements/scales fit solely

Table 2: Thematic findings for Resilience Domain across 21 selected scales

Themes	Definition/description of themes	Exclusive attributes (construct confined to only 1 theme)	Shared attributes (between themes)
Control	Being composed and controlled under stressful adversity	<ol style="list-style-type: none"> Control Composure Tolerance of negative effect Internal locus of control Emotional regulation Interpersonal warmth & insight Interpersonal control Skilled expressiveness Humour Self-esteem 	<ol style="list-style-type: none"> Confidence Self-efficacy Perceived self-efficacy Independent Social sensitivity Cultural sensitivity Social competence Self-concept Confident optimism Acceptance of self & life Positive acceptance of change Productive & Autonomous activity
Resourceful	Being able to find appropriate solutions from available resources to deal with adversity	<ol style="list-style-type: none"> Trust in one instinct Personal competence/ strength Creativity Problem-solving Social resources/ support Insight Novelty seeking 	<ol style="list-style-type: none"> Initiative Self-control Communication & cooperation Work commitment & learning Positive future & orientation Challenge Planned future
Growth	Keep growing and bouncing back stronger from the adversity	<ol style="list-style-type: none"> Empowerment Strengthening effect of stress Goals/goal setting & Aspiration Vision Coping & adaptation 	
Involvement	Being committed to deal with the adversity	<ol style="list-style-type: none"> Commitment Perseverance Tenacity Structured style/personal structure 	

to that particular theme. For example, the “composure” construct from the Predictive Six-factor Resilience Scale is primarily about emotional regulation and the ability to recognise, understand, and act on internal prompts and physical signals (74). This fits well and is primarily relevant to the theme “control” which we describe as “being composed and controlled under stressful adversity”.

On the other hand, constructs that belong to more than one theme is referred to as shared attributes which possess definitions and application that overlaps between themes. For example, the attribute “challenge” appears in several scales bearing a collective description as such: the extent to which individuals see change and setbacks as

challenges rather than threats to security and survival, being more open to change while possessing attitudes with a kind of zest for life and living that leads one to perceive changes and challenges as exciting, viewing them as opportunities for growth and will actively seek them out and will identify problems as ways for self-development (41–45).

This is a prime example of an attribute that encompasses multiple themes, in this case it overlaps between the themes namely resourceful— “being able to find appropriate solutions from available resources to deal with adversity,” growth— “keep growing and bouncing back stronger from the adversity,” and involvement— “being committed to deal with the adversity”.

Table 3: The emerging themes of resilience from the attributes described in 21 selected scales

Research tool	Control	Resourceful	Growth	Involvement
MTQ48	★	✓	✓	★
CD-RISC-25	★	★	★	★
Resilience Scale for Adult (RSA)	✓	★	✓	★
Adolescent Resilience Scale (ARS)	★	★		✓
Resilience Scale for Adolescent (READ)	✓	★	✓	★
Resilience Scale for Adolescent (READ)	✓	★	✓	★
Ego-Resiliency	★		✓	✓
Ego-Resiliency	★		✓	✓
Resilience in Mid-Life Scale (RIM)	★	✓	★	★
Dispositional Resilience Scale (DRS)	★	✓	✓	★
Dispositional Resilience Scale-30	★	✓	✓	★
Dispositional Resilience Scale-15	★	✓	✓	★
53 Item Hardiness Scale	★	✓	✓	★
Resilience Scale (RS-25)	✓	★	✓	
Resiliency Attitude & Skills Profile (RASP)	★	★		✓
California Healthy Kids Survey – The Resilience of the Student	★	★	★	✓
Youth Resiliency Assessing Developmental Strengths (YRADs)	✓	✓	★	✓
General Self-Efficacy Scale (GSE)	✓	✓		
Cognitive Hardiness Scale	★	✓	✓	✓
Psychological Resilience	★	★		
Predictive Six-factor Resilience Scale	★	✓	★	★

Notes: ✓ – the scale contains construct with overlapping themes
 ★ – the scale contains construct exclusively to the theme

Shared attributes pose a more comprehensive view of resilience, the constructs are relatively well-rounded and pulls the themes towards the center of the emerging themes constituting the conceptual framework of resilience in this article, proposed in Figure 1. There are 19 shared attributes that overlap between at least two or more themes in this emerged resilience concept.

Table 3 maps the constructs from the 21 selected scales against the four emerging themes. In general, the scales are well mapped to the four emerging themes either as exclusive or shared constructs.

Figure 1 illustrates the relationship between the four emerging themes with the two continuums of state (present and future) and condition (internal and external). The internal environment is composed of various elements present inside the organisation, that can affect or can be affected by, the choices, activities, and decisions of the organisation (75). External factors are things from outside an organisation that directly or indirectly influences it. Oftentimes, these external factors are outside of the control of organisation (76). The present state is a present set of circumstances (77). The future state is a set of circumstances that will come after the present or the things that will happen then (78).

DISCUSSION

Resilience scales are developed based on several constructs and are summarised in Table 1. The resilience scales were developed based on sound theoretical foundations, for example, the mental toughness scale MTQ48 is based on the 4C model (commitment, challenge, confidence, control), and the various resilience scales were used in different contexts, with control as the most common construct to be used in many of the scales listed.

Resilience is generally defined as mentioned above and this has been firstly described by Kobasa et al. (41) as the collection of personality characteristics (particularly commitment, control, and challenge) to be able to cope and thrive under pressure. Early studies suggested that resilience is fixed as a trait and then it is developed into dynamic process, multidimensional and holistic perspective (outcome or process-oriented) (9). The constructs of early studies are mainly focused on individual personalities such as optimism, self-efficacy, self-reliance, personal competence and later further developed into constructs in relation to the individual’s social environment and external support systems such as friends, family, school as well as wider community connections. Resilience as a personality-trait is best explained as the psychological

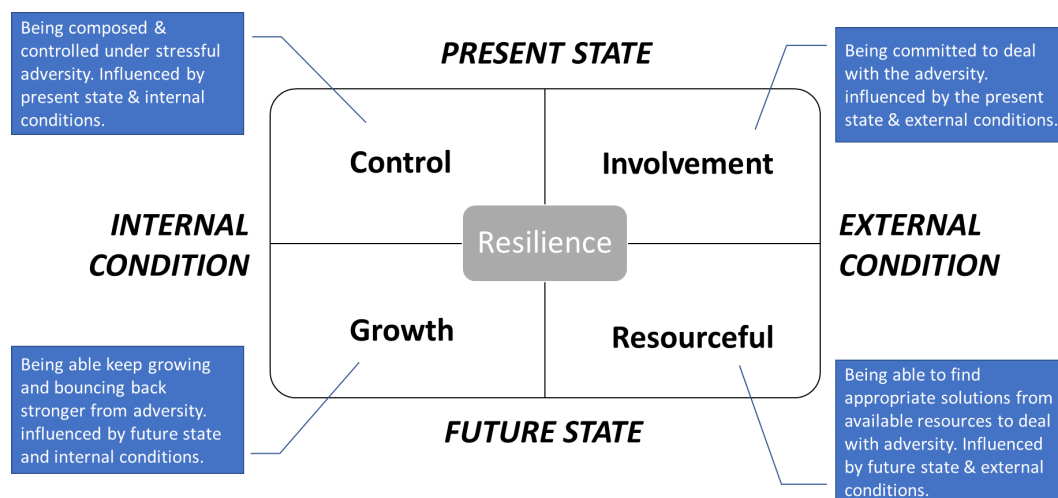


Figure 1: The integrated resilience model derives from 21 selected resilience scales

attributes within the individual's self that improve coping ability and adaptability to stressors. It is something that is fixed and cannot be changed. However, resilience has shifted to outcome-oriented which is focusing on mental health after the individual has been exposed to stressors and adversity. It is something that can be developed, modified and can be predicted by resilience factors such as outside resources and internal resources (i.e. self-beliefs). In recent years, resilience is being described as process-oriented approach. It is dynamic as a process and adaptable through consistent training and progress.

Based on the findings of our study, we proposed an integrated resilience model to conceptualise the relationships of the four emerging themes of resilience within the two continuums of state (present and future) and condition (internal and external) as shown in Figure 1. We organised the four themes within the framework in relation to these continuums. Based on Figure 1, control is influenced by present state and internal condition; involvement is influenced by present state and external condition; growth is influenced by future state and internal condition; resourceful is influenced by future state and external conditions. Based on this model, resilience is a combination of traits (exclusive and shared constructs), processes (state and condition) and outcomes (the four emerging themes). Starting from left to right, control and growth are coming from the internal condition of the human being while involvement and resourceful are determined by the external conditions. From top to bottom, control and involvement are influenced by the present state, while growth and resourceful are bound to future state (3). This model is unique because it addresses three main perspectives on resilience.

Considering operational definitions of the four emerging themes and their location in the developed model; Control is agreed to be defined as being composed and

controlled under stressful adversity and it is influenced by the internal condition and present state. Involvement is defined as being committed to deal with adversity and it is influenced by the present state and external conditions. Resourceful is defined as being able to find appropriate solutions from available resources to deal with adversity and it is influenced by future state and external conditions. Growth is defined as being able to keep growing and bouncing back stronger from adversity and it is influenced by future state and internal conditions. Based on this model, resilience is a combination of the traits (exclusive and shared constructs), process (state and condition) and outcomes (the four).

CONCLUSION

This article proposes a unique framework because it combines the three main perspectives of resilience (traits, process, and outcomes) into a common concept of resilience. As a result, some or most of the themes or constructs which emerged from the current measurement of resilience are less developed, for instance “resourceful”, “involvement” and “growth”. Dozens of resilience scales are used in research, yet there is no specific scale that was developed and validated to measure resilience explicitly for health professionals or trainees. In addition, limited evidence that any scale is superior to another (38). Given the increasing interest in resilience of healthcare workers from major stakeholders (79), researchers are urged to develop a resilience scale specifically for healthcare workers by considering the proposed resilience constructs.

Considering the proposed resilience model, faculty members might want to emphasise the four resilience constructs during learning and teaching, for example, give a span of control for students to make contributions during learning sessions, get them involved with the daily routine of a doctor, provide adequate educational resources to facilitate

their learning, and provide regular non-threatening feedback for them to bounce back and grow stronger.

Infusing Resilience in the Assessment of Medical and Health Professions Education is another promising outcome of application of this new framework. Objectivity is so far the current approach in medical and health professions education to meet the quality needs and expectations of different stakeholders. Humanity is seldom highlighted to be considered alongside with this approach. Studies showed that medical students consider academic life particularly exams and tests are events that are most stressful; not only that, the extensive content to be learned but lack of time to revise were also among the most stressful events perceived by the students (80–84). This indicates that something should be remedied in the current practice/system of assessment. This mandates a strong call to rethink/reimagine the current framework of assessment practices in medical training so that it reduces stress and anxiety, thus promoting resilience development in medical trainees. In addition to huge efforts to objectifying activities of the assessment system to proof quality, it is a mandatory step to humanise assessment practice and infuse resilience constructs in this practice. Assessment systems should enhance students' capabilities by addressing these four resilience components; control, involvement, resourceful and growth. For example, provide students with clear descriptions of the assessment system to enhance their control, involving them in frequent formative assessment or mock exams for students to enrich their resourcefulness. Hence, students can grow based on these practices and be more resilient against adversities.

Correlating resilience and future performance is difficult not only because of inadequacies in the theory, concept and measurement of resilience itself but also because relevant, robust measures of outcome that can directly attribute to the

effects of training have not been defined. Current efforts to reframe the resilience concept will guide researchers on refining the resilience scale and therefore may provide a more solid foundation for research on resilience.

RECOMMENDATIONS

This study proposes an integrated resilience model that is a promising model which can be used for different practical implications. It can be a basis for building new measurement scales, nurturing resilience in medical and health professions education, and infusing resilience elements in current assessment practices.

ACKNOWLEDGEMENTS

This work is a part of the research project that was funded by Fundamental Research Grant Scheme (FRGS: 203.PPSP.6171219), Ministry of Education, Malaysia.

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