

Table 1: Summary of Included Reviews and Resilience Factors

| Author, Year Title | Aims, Review Methods | Sample*, Publication Time, Professions/Specialties, Geography, Quality Assessment | Resilience Factors** and Summary of Findings on Resilience Factors |
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| Cleary et al., 2018 The effectiveness of interventions to improve resilience among health professionals: A systematic review | To assess the effectiveness of resilience interventions in improving resilience outcome among health professionals PRISMA Systematic Review | 33 studies, published in years 2006-2018 Nurses, Physicians; mixed-group (Nurses, Physicians, Dieticians, Managers, Educators, Psychologists, Social Worker, Students) Palliative Care, Oncology, ICU USA, Australia, Canada, Germany, UK, Israel, Sierra Leone Use of Joanna Briggs Critical Appraisal Tools, JBI for randomized and non-randomized methods determined low to moderate rigor | Educational Individual Educational interventions such as mindfulness-based interventions and cognitive behavioral therapy can improve resilience. Identifying triggers for workplace stress and being self-aware to adopt reflexive strategies to preempt these triggers can build resilience. Resilience is also improved by opportunities to work collaboratively with peers outside of work to improve communication and create positive dynamics. One's own resilience was considered to affect the resilience of others. Self-care is also a key mechanism to promote resilience. |
| Fox et al., 2018 A systematic review of interventions to foster physician resilience | To synthesize literature describing interventions to improve resilience among physicians exclusively and to outline the type and efficiency of interventions implemented PRISMA Systematic Review | 22 studies, published in years 2000-2016 All studies included Physicians only or Physicians with other professions/students Palliative Care, Primary Care, OBGYN, ICU, Pediatrics, Psychiatry, Radiology, Surgery USA, Germany, Israel Use of 27-item Downs and Black checklist determined poor quality due to low methodological rigor | Educational Multiple educational interventions including psychosocial skills training, mindfulness based interventions, coaching training intervention, simulation training intervention, etc. were reviewed- it was difficult to determine the true efficacy of the implemented interventions due to low methodological rigor of studies and vague concept and definition of resilience. |
| Gillman et al., 2015 Strategies to promote coping and resilience in oncology and palliative care nurses caring for adult | To identify personal and organizational strategies that promote coping and resilience in oncology and palliative care nurses caring for adult patients with malignancy. | 20 studies, published in years 1994-2013 Nurses only Palliative Care, Oncology, Cancer, Community, In-patient Settings USA, Australia, Italy, Canada, Sweden, Wales, Taiwan, Portugal | Educational Individual Interactive Coping Organizational Having a sense of calling, finding meaning, adopting a positive perspective and deriving satisfaction from work helps to build resilience. Building conscious connections, making conscious efforts for self-care and work-life balance, processing emotions (e.g., reflection, prayer) and applying |

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| patients with malignancy: a comprehensive systematic review | Qualitative data reanalyzed and synthesized into themes; quantitative data aggregated and described, unable to pool data. | Use of Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument determine low methodological rigor | experiences gained (e.g., professional shielding) and planned problem solving can also help to build resilience. Organizational direction in creating psychologically safe environments with avenues for formal and informal social support and sharing can help to promote resilience, creating long term effects on education and training of nurses, fostering camaraderie and solidarity, enabling them to engage and meet their patients’ needs better. Staff should have access to support without being judged as “not coping.” To further build resilience, organizations can also provide sanctioned time for staff to engage in bereavement rituals. |
| Hart et al., 2014 Resilience in nurses: an integrative review | To describe nursing research that has been conducted to understand the phenomenon of resilience in nurses. Whittemore and Knafl integrative approach | 7 studies published between 2004-2011 Nurses only Operating Room, Hospice, Academia Australia, USA, UK Use of Melnyk & Fineout-Overholt 7-scale level of evidence found that all 7 articles were at Level VI: single descriptive, qualitative, or physiological studies | Individual Interactive Approaches Cognitive reframing, toughening up, emotional toughness and emotional detachment, grounding connections and work-life balance, critical reflection and reconciliation builds resilience. Repeated exposure of caring for certain patients also helps build resilience. Interactive factors include grounding connections with family, friends, and colleagues, and reconnecting with previous close relationships. Other innate coping methods that foster resilience include critical reflection to assimilate their education with practice, seeking collegial support, reflective journaling, networking, collaborative work, positive attitude, exercise, volunteerism, and seeking mentors. |
| Howard et al., 2019 Personal resilience in psychiatrists: systematic review | To explore factors affecting personal resilience among psychiatrists, in particular, those that may impair well-being and those that facilitate resilience practice. Systematic Review-synthesis | 33 studies published between 2003-2017 Psychiatrists only Child & Adolescent Psychiatry, Adult Psychiatry, Forensic Psychiatry Australia, New Zealand, the UK, USA, Canada, Italy, Finland, Portugal, Romania Assessment of the quality of research included was not mentioned, mentions lack of high-quality research and various bias | Individual Interactive Approaches Finding ways to reduce personal burnout, stress, and increase well-being were found to be factors supporting resilience. Effective time management, more departmental staffing, more experience, supportive colleagues, psychological support, and assessment and treatment skills training decreases burnout. Cognitive behavioral therapy, counseling, stress awareness, actively seeking support, confiding in colleagues, better management of workplace, crisis teams, and working in teams reduces stress. Personal well-being such as having kids, being involved in intimate |

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| | | | relationships, academic involvement, self-care training improves job satisfaction. |
| McKinley et al., 2019 Resilience in medical doctors: A systematic review | To identify, summarize, and critique the existing published information using a narrative synthesis Narrative Synthesis | 24 studies published between 2008-2018 Physicians or Medical Trainees Family Medicine, Primary Care, Internal Medicine, OBGYN, Surgeons, Pediatrics, Rural Healthcare, Urban Settings USA, Australia, Canada, South Africa, UK, Germany Assessment of the quality of research included was not mentioned, mentions self-assessment bias and low rigor | Individual Interactive Approaches Organizational Innate qualities such as self-directedness, persistence, cooperativeness, mindfulness, previous adversity experience before job, and low harm avoidance are suggested factors of resilience. Interactive coping such as social support from colleagues, relationships with family and friends, relatedness, feelings of being connected and understood, and physical activity supports resilience. Organizational considerations that support resilience include larger clinical units, self-care training, support from supervisor or senior colleagues, lighter workload, career development, part-time roles, and the degrees of freedom to organize own working life and pursue other interests. |
| Robertson et al., 2016 Resilience of primary healthcare professionals: A systematic review | To examine definitions and measures of resilience, identify characteristics and components and synthesize current evidence about resilience in primary healthcare professionals Systematic Review | 13 studies published between 2007-2014 Physicians, Physicians + other healthcare professionals Primary Care, Family Medicine Australia, USA, Germany, Sweden, UK, Canada, South Africa Assessment of the quality of research included was not mentioned, mentions variability of data as a limitation to study | Individual Interactive Approaches Organizational Female general practitioners raising children have less time for recreation which impairs resilience. Resilient clinicians were characterized by high self-directedness, conscientious, self-accepting, high persistence, low harm avoidance, higher tolerance of uncertainty, and have a sense of purpose or vocation. Workload management, family support and making time for recreation and physical activities improved resilience. Workplaces should foster practices that recognize the importance of boundaries between work and home life and provide opportunities for development and social support to mitigate against work intensity and volume. |
| Rogers, 2016 Which educational interventions improve | To summarize the current evidence on educational interventions to develop healthcare worker resilience | 16 studies published between 2008-2014 Medical Students, Nurses, Physicians Primary Care, Hospital units, rural settings, academic settings | Educational Education can improve health care workers' resilience. Reasonable evidence was found for resilience enhancing effects of workshops and cognitive behavioral interventions. Some evidence was found for small group problem solving. |

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| healthcare professionals' resilience? | Literature review of primary research studies | Canada, USA, Australia, Sweden, China, Uganda, UK Use of Medical Education Research Study Quality Instrument (MERSQI) determined weak research methodology | The evidence for the effects of reflection, mentoring, mindfulness, and relaxation techniques was mixed. A combination of interventions might represent the best chance of success. |
| Wright et al., 2017 Methods of Alleviating Stress and Increasing Resilience in the Midwifery Community: A Scoping Review of Literature | To map and summarize available literature about coping mechanism for midwives and identify conditions that promote resilience Scoping Review | 6 studies published between 2011-2016 Midwives, Midwives and Physicians or Nurses Hospitals, community, and rural settings UK, Israel, Uganda, Iran, Australia Use of Johns Hopkins Nursing Evidence-Based Practice Model found low quality evidence with major flaws | Educational Interactive Approaches Organizational Educational interventions such as mindfulness-based stress reduction, meditation and guided imagery have promising results for reducing work stress and increase resilience, but the studies reporting these are mainly of low quality. Venting, active coping, positive reframing, self-distraction and planning for future birth encounters can function as effective coping strategies. There needs to be a systematic program of support from employers, superiors and colleagues, coupled with appropriate staffing to improve resilience. |

*All reviews included quantitative, qualitative, and mixed methods studies

**Individual=Individual and personal factors; Educational=Educational interventions; Interactive Approaches=Approaches that an individual takes when interacting with professional circumstances; Organizational=Organizational and environmental factors.

Table 2: Summary of Studies and Review Findings

| Author & Included Study Designs | Summary of Types of Interventions | Summary of Measurement Tools Used | Thematic Findings of Review |
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| Cleary et al., 2018 15 pre-post design; 10 RCTs; 5 non-randomized controlled design, 3 mixed methods with qualitative approach | <ul style="list-style-type: none"> Modified Mindfulness-Based Stress Reduction (MBSR) training program Stress Management and Resiliency Training (SMART) Provider Resilience Mobile Application (PRMA) Helping Health Workers Cope (HHWC) Promotion of Acceptance in Careers and Teachers (PACT) Workshop Reflective writing Cognitive-Behavioral Therapy (CBT) Guided imagery Compassion fatigue training Self-care training | <ul style="list-style-type: none"> Connor-Davidson Resilience Scale (CD-RISC) Brief Resilient Coping Scale (BRCS-4) Quality of Life (ProQOL-5) for Compassion fatigue and satisfaction Diener's Flourishing Scale General Health Questionnaire (GHQ012) | <ul style="list-style-type: none"> Inconsistent findings on the significance of educational interventions Inconsistent duration of intervention --the more there were, the more significant Inconsistent duration of sessions (90min-8hr) --the longer, the more significant Inconsistent results of sustainability of intervention - -longer interventions had longer sustainability Lack of uniformity on how researchers constructed resilience and how it was measured, no standard definition with no agreed criteria In literature, mental health measures are not correlated with resilience |
| Fox et al, 2018 17 quantitative (11 pre/post design, 6 RCTs), 4 mixed methods, 1 qualitative | <ul style="list-style-type: none"> Psychosocial skills training Mindfulness-based intervention Self-directed stress management Resiliency training Relaxation response resiliency program Compassionate communication Coaching and Narrative training Resilience in stressful events intervention Simulation training intervention | <ul style="list-style-type: none"> Brief Resilient Coping Scale (BRCS) Connor-Davidson Resilience Scale Cognitive Hardiness Scale General Self-Efficacy Scale Interpersonal Reactivity Index (IRI) Personal and Organizational Quality Assessment-Revised Smith's Brief Resilience Scale The 14-item Resilience Scale Ways of Coping Scale | <ul style="list-style-type: none"> There is a need for methodologically rigorous research to identify interventions to improve resilience (i.e., treatment effects were inconsistent with poor confidence) Interventions have tended to focus on building resilience only at an individual level There is a need to take a systems-wide approach to resilience that targets both the individual and organization |
| Gillman et al., 2015 8 quantitative, 8 qualitative, 4 mixed methods | <ul style="list-style-type: none"> 6-hr program to teach positive self-care 5-week program on compassion fatigue resiliency Self-help stress inoculation training Individual strategies to promote coping and resilience Explore hope experience Staff retreat | <ul style="list-style-type: none"> Maslach Burnout Inventory Ways of Coping Questionnaire Revised Grief Experience Inventory Secondary Traumatic Stress Symptoms Professional Quality of Life (ProQOL) | <ul style="list-style-type: none"> Resilience is supported by preventative measures, control measures, unburdening and "letting go", and growing and thriving Individuals must take responsibility and organizational support is integral to equipping with a range of formal and informal support: <ul style="list-style-type: none"> foster connections within the team |

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| | | <ul style="list-style-type: none">● Impact of Event Scale (IES-R)● Self-transcendence Scale● Brief Coping Orientation to Problems Experienced (COPE) | <ul style="list-style-type: none">○ provide education and training to develop behaviors that assist in controlling or limiting the intensity of stress or aiding recovery○ assist in processing emotion and learning from experiences |
| Hart et al., 2014 3 quantitative, 4 qualitative | <ul style="list-style-type: none">● Not mentioned● Mentioned phenomenology and ethnography observations | <ul style="list-style-type: none">● Connor-Davidson Resilience Scale● Stress Resiliency Profile | <ul style="list-style-type: none">● Consistent level of findings: descriptive, qualitative, physiological with varied samples● Resilience can be learned; organizations can assist● Personal traits and characteristics lead to resilience● Strategies are at the individual, group, and organizational level |
| Howard et al., 2019 28 quantitative, 2 qualitative, 1 interventional, 2 mixed methods | <ul style="list-style-type: none">● Job satisfaction workshops● Counseling● Job resources program● Well-being activities● Self-care training package | <ul style="list-style-type: none">● Maslach Burnout Inventory (MBI)● Copenhagen Burnout Inventory● Sources of Stress Questionnaire● Perceived Stress Questionnaire● Minnesota Job Satisfaction Scale● General Health Questionnaire (GHQ28) | <ul style="list-style-type: none">● Lack of high-quality research● Interventions take place at workplace level, personal level, and non-workplace level |
| McKinley et al., 2019 10 quantitative, 8 qualitative, 5 interventional | <ul style="list-style-type: none">● Group trainings on resilience● Mindfulness-based interventions | <ul style="list-style-type: none">● Brief Resilience Scale● Resilience Scale● Resilience Scale-14● Brief Resilient Coping Scale● Connor Davidson Resilience Scale● Block Ego-Resiliency Scale | <ul style="list-style-type: none">● Resilience is complex with multifactorial etiology● Resilience is more than an individual resource with modifiable factors such as social support and environmental contexts● Mindfulness-based interventions alone do not show evidence to increase resilience scores● Cognitive behavioral strategies are encouraging, but have resource implications● Reflection, mentorship, mindfulness and relaxation techniques had some evidence, but effective in combination with other methods |
| Robertson et al., 2016 8 quantitative, 4 qualitative, 1 intervention | <ul style="list-style-type: none">● Mindfulness skills training (mindfulness medication) | <ul style="list-style-type: none">● Wagnild and Young resilience Scale● Connor Davidson Resilience Scale● Maslach Burnout Inventory | <ul style="list-style-type: none">● Resilience is multifaceted● Interactions were identified between personal growth and accomplishment in resilient professionals● Resilience is strongly correlated to high persistence, high self-directedness, low avoidance of challenges● Resilience has significant associations with traits supporting high function levels associated with demanding health professional roles● Current resilience measures do not allow for these current aspects in the primary care context |

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| <p>Rogers, 2016</p> <p>5 qualitative, 2 mixed methods</p> | <ul style="list-style-type: none"> ● Resilience workshops ● Small group problem sharing and solving ● Individual and group reflection ● Cognitive behavioral strategies ● Stress Management and Resiliency Training (SMART) Program ● Mindfulness and relaxation training- ● Mentoring of resilience strategies | <ul style="list-style-type: none"> ● Wagnild and Young resilience Scale ● Connor Davidson Resilience Scale | <ul style="list-style-type: none"> ● Resilience workshops giving information on the importance in combination with techniques could improve resilience ● Small group problem solving and sharing may help ● Individual and group reflection alone has weak evidence in supporting resilience ● Cognitive behavioral strategies may help resilience |
| <p>Wright et al., 2017</p> <p>2 qualitative, 3 quantitative, 1 mixed methods</p> | <ul style="list-style-type: none"> ● Stress management program on occupational stress ● 8-week mindfulness course on midwives' stress ● Mindfulness-based stress reduction program | <ul style="list-style-type: none"> ● Death Distress Scale ● Brief COPE (Coping with Problems Experienced) ● GHQ=12 (General Health Questionnaire) ● SOC (Sense of Coherence) ● DASS (Depression, Anxiety, Stress Scale) ● Toft-Anderson occupational stress scale ● Stephen Robbins' Job Description Index (JDI) | <ul style="list-style-type: none"> ● Midwives desire work-based programs and support from colleagues and employers for increasing coping abilities ● Mindfulness-based stress reduction program may improve stress and coping |