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PSYCHOLOGICAL FACTORS AND COMMUNICATION SKILLS TRAINING IN INTENSIVE CARE MEDICAL STAFF

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Cover illustration: Illustration by author (Johan Holmberg) depicting work in intensive care during the Covid-19 pandemic

PSYCHOLOGICAL FACTORS AND COMMUNICATION SKILLS TRAINING IN INTENSIVE CARE MEDICAL STAFF THESIS FOR DOCTORAL DEGREE (Ph.D.)

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To my beloved family

POPULAR SCIENCE SUMMARY OF THE THESIS

Working in intensive care can be demanding and experienced as distressing by medical staff. Specific aspects mentioned are a heavy workload, moral distress, end-of-life care, and interpersonal issues/conflicts with colleagues, patients, and relatives. Some of these aspects are quite general in nature, and others are more unique to intensive care. The *workload* is often difficult to predict in intensive care and due to the nature of patients' medical condition, serious complications and negative events are more likely to occur. This means that patients in general require high levels of attention and nursing care. *Moral distress* is referring to the stress experienced by healthcare professionals when ethically justified actions are not taken due to practical considerations. Such moral dilemmas are more common in intensive care than in healthcare in general. *End-of-life care (EOL)* is central to intensive care. EOL focuses on symptom control, end-of -life management, and communication with relatives. Finally, *interpersonal issues and conflicts* between colleagues, between staff and patients, and between staff and relatives constitute a primary source of stress.

The pressure that characterizes intensive care has been shown to result in elevated levels of stress, burnout, anxiety, depression, and post-traumatic stress among intensive care medical staff. In addition to health-related concerns, work-related concerns have been observed in terms of high staff turnover, elevated levels of intention to leave, and low work performance. Notably, not all intensive care units show elevated levels of problems related to health and work. There are large differences between units, and also between individuals working in the same unit. However, overall, most studies report elevated levels of distress.

In addition, the covid-19 pandemic has brought an extreme pressure on intensive care medical staff during the last two years, which has raised the need for healthcare organizations to manage resources and support to staff.

Four studies were included in this thesis. Two studies concern definitions and measurement of psychological health among healthcare professionals (Study I and II), and two studies concerns the evaluation of support efforts and interventions given to staff to improve health among intensive care medical staff (Study III and IV).

Study I and study II measured occupational psychological health among healthcare professionals and especially focused on the possible usefulness of *psychological flexibility*. Psychological flexibility reflects an ability to (1) act in according to your goals and values, (2) be present and aware of the situation at hand, (3) also in the presence of distressing thoughts and feelings. An ability that presents considerable difficulties in certain situations. For example, when you have doubts over your abilities to manage a difficult and important task, or when you are about to engage in a difficult conversation. Study I and II showed the usefulness of a Swedish translation of a self-report questionnaire, measuring psychological flexibility, called the Work-related Acceptance and Action Questionnaire. Furthermore, study II, showed the

In Study III, an intervention to improve occupational psychological health was given to the entire staff at an intensive care unit. During the intervention staff were given the opportunity to share and discuss distressing situations from work in a group setting with a psychologist running the group. The intervention focused on communication skills training

of specific situations from work where staff had the opportunity to role play and try out different ways to act. The specific skills trained in groups were (1) listening skills, (2) asking for help, (3) show appreciation, (4) how to say no, and (5) sharing of mistakes at work. It was up to each participant to assess their own needs and choose the focus of their work during intervention. Between group sessions staff were given assignments related to communication that they could work on. Preliminary results from the study showed staff to report reduced levels of stress and improved general mental health after the intervention. Although further studies are needed to ascertain those results are an effect of the intervention and not some other changes that took place at work at the same time.

Finally, study IV, evaluated a support effort delivered to an intensive care unit during the covid-19 pandemic. The support consisted of a variety of activities at different levels of the organization. It included manager support, individual support, onboarding (recruitment of staff from other units at the hospital to solve staffing problems), peer support, daily group sessions, and education/training. The evaluation of the delivery showed group reflection sessions and peer support to be used by staff in large extent and this could be a possible indication of the usefulness of these activities. Furthermore, interviews with psychologist delivering the intervention showed preliminary support of the model.

Overall, the studies, and the literature covered in this thesis, presents a need within intensive care for interventions to improve the occupational psychological health of staff. Conclusions from the studies are that Study I and II show the utility of measuring psychological flexibility and present a Swedish version of the Work-related Acceptance and Action Questionnaire that can be used to study occupational psychological health. Study III and IV show the possible potential of working with communication skills training to improve occupational stress and general mental health among staff in intensive care.

ABSTRACT

Background. Intensive care settings have been shown to present a demanding work setting with health related and work-related consequences for intensive care medical staff. The health-related consequences observed are high levels of burnout, traumatic stress, symptoms of anxiety, depression, and fatigue. Specific stressors mentioned by staff is high workload, moral distress, end-of-life issues, and interpersonal issues/conflicts with colleagues, patients, and relatives. During the covid-19 pandemic, the need for healthcare organizations to attend to the occupational psychological health of staff has been evidently clear. Although, the prevalence of stress in intensive care has been previously observed and reported on, at least since the 70s.

Purpose and aims. Overall purpose of thesis was threefold; to improve knowledge on occupational psychological health among healthcare staff, particularly in intensive care settings, to develop a behavioural intervention to improve communication skills and management of distress to enhance occupational health, and to evaluate the implementation of psychological support to ICU staff. The thesis included four studies and the specific aim of study I was to evaluate the reliability and validity of a Swedish version of the Work-related Acceptance and Action Questionnaire (WAAQ), a self-report questionnaire measuring psychological flexibility at work. Study II evaluated the relationship between psychological flexibility (measured by WAAQ) and other aspects of occupational psychological health, i.e., perceived stress, general mental health, and work engagement, in a sample of intensive care medical staff. Study III evaluated the effects of a Behavioral Skills Training (BST) program on dependent measures of occupational psychological health in a sample of intensive care medical staff. Finally, study IV evaluated the implementation and feasibility of a psychological support model rapidly developed and implemented for ICU staff during the first wave of the covid-19 pandemic.

Methods. Four studies were included in the thesis. Study I used a cross-sectional design to evaluate reliability and validity of a measure of psychological flexibility, WAAQ, in a sample of healthcare professionals. In a subsample of participants, a longitudinal design was used to evaluate test-retest reliability. Measures used in the study were three self-report questionnaires, WAAQ, PSS-10 (Perceived Stress Scale-10), and UWES (Utrecht Work Engagement Scale) and the sample consisted of 184 healthcare professionals. Study II evaluated the relationship between psychological flexibility (WAAQ), work engagement (UWES), perceived stress (PSS-10), and general mental health (GHQ-12) in a cross-sectional design in a sample of intensive care medical staff. A longitudinal design was used in a subsample (n=46) to further evaluate the relationship between WAAQ and UWES. Study III evaluated the effects of the BST program in a pre-post uncontrolled trial with three assessment points (pre, mid, and post). Study IV used a cross-sectional and qualitative design to evaluate implementation of the support model.

Results. In study I, WAAQ showed good internal consistency and good test-retest reliability. Furthermore, it showed a significant negative relationship with perceived stress and significant positive relationship with work engagement. In study II, a hierarchical regression analysis showed WAAQ to explain variance in UWES when controlling for

PSS-10 and GHQ-12. Additionally, WAAQ had a significant indirect effect on the relationship between perceived stress (PSS-10) and work engagement (UWES), and the relationship between general mental health (GHQ-12) and work engagement (UWES). In Study III, dependent t-test and linear mixed model analysis of occupational psychological health showed decrease in perceived stress (PSS-10) and improved general mental health (GHQ-12). It showed no change on measures of psychological flexibility (WAAQ) or work engagement (UWES) Study IV showed that although all support efforts were used, daily group sessions followed by peer support had the highest attendance ratings in relation to awareness. Furthermore, interviews with psychologists delivering support showed three themes labelled *utility*, *challenges*, and *keys to implementation*.

Conclusion. Results from study I support the use of the Swedish version of WAAQ as a measure of psychological flexibility among healthcare professionals, and considering the sample composition, especially among highly educated female samples. Study II showed support for the utility of psychological flexibility and work engagement to assess and characterize occupational psychological health among intensive care medical staff. Although tentative, findings of study III, support the use of the BST program to promote occupational psychological health among intensive care medical staff. Lastly, the process evaluation of the support model delivered during the pandemic, suggested the importance of a rapid implementation of support when needed, and that success is dependent on the managers to facilitate and implement the interventions, as well as access to competent resources.

LIST OF SCIENTIFIC PAPERS

- I. Holmberg, J., Kemani, M. K., Holmström, L., Öst, L.-G., and Wicksell, R. K. (2019). Evaluating the psychometric characteristics of the Work-related Acceptance and Action Questionnaire (WAAQ) in a sample of healthcare professionals. *Journal of Contextual Behavioral Science*, 14, 103–107. <https://doi.org/10.1016/j.jcbs.2019.08.010>
- II. Holmberg, J., Kemani, M. K., Holmström, L., Öst, L.-G., and Wicksell, R. K. (2020). Psychological Flexibility and Its Relationship to Distress and Work Engagement Among Intensive Care Medical Staff. *Frontiers in Psychology*, 11, 603986–603986. <https://doi.org/10.3389/fpsyg.2020.603986>
- III. Holmberg, J., Rosendahl, I., Grudin, R., Kemani, M. K., Holmström, L., Öst, L.-G., and Wicksell, R. K. (2021). Communication skills training (CST) to improve occupational psychological health among intensive care medical staff, results from an uncontrolled clinical trial [Manuscript submitted for publication].
- IV. Appelbom, S., Bujacz, A., Finnes, A., Ahlbeck, K., Bromberg, F., Holmberg, J., Larsson, L., Olgren, B., Wanecek, M., Wetterborg, D., and Wicksell, R. (2021). The Rapid Implementation of a Psychological Support Model for Frontline Healthcare Workers During the COVID-19 Pandemic: A Case Study and Process Evaluation. *Frontiers in Psychiatry*, 12, 713251–713251. <https://doi.org/10.3389/fpsyg.2021.713251>

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LIST OF ABBREVIATIONS

AAQ	Acceptance and Action Questionnaire
ACT	Acceptance and Commitment Therapy
AFQ-Y	Acceptance and Fusion Questionnaire-Youth
APA	American Psychological Association
ATQ	Automatic Thought Questionnaire
BFAS	Big Five Aspects Scale
BST	Behavioural Skills Training
CBA	Controlled Before After study
CBT	Cognitive Behavioural Therapy
Covid-19	Corona Virus Disease-19
CST	Communication Skills Training
DAS	Dysfunctional Attitude Scale
DCSQ	Demand Control Support Questionnaire
DP	DePersonalization (subscale of MBI)
EE	Emotional Exhaustion (subscale of MBI)
EOL	End Of Life care
FFMQ	Five Facets of Mindfulness Questionnaire
GHQ-12	General Health Questionnaire-12
HCP	Health Care Professional
HCW	Health Care Worker
ICC	Intra Class Correlation
ICU	Intensive Care Unit
ITS	Interrupted Time Series
LMM	Linear Mixed Model
MAAS	Mindful Attention Awareness Scale
MEAQ	Multidimensional Experiential Avoidance Questionnaire
MBI	Maslach Burnout Inventory
MI	Motivational Interviewing
PF	Psychological Flexibility
PCA	Principal Component Analysis
PICU	Pediatric Intensive Care Unit
PPFI	Personalized Psychological Flexibility Index

PSS-10	Perceived Stress Scale-10
RCT	Randomized Controlled Trial
SIT	Stress Inoculation Training
SWEBO	Scale of Work Engagement and BurnOut
UWES	Utrecht Work Engagement Scale
WAAQ	Work-related Acceptance and Action Questionnaire
WE	Work Engagement
WHO	World Health Organization

1 INTRODUCTION

The intensive care unit (ICU) is where the patients who are most in need of care meet our healthcare system. Lives are literally saved every day in intensive care units, and this is where some patients spend their last days in life. Here, family members, children, spouses, siblings, best friends, and parents see their loved ones, uncertain of the outcome of the next few days.

This is also a place of work for intensive care medical staff, and it is their health that is the focus of this thesis. The unusual demands they meet adversely affect the health of staff working in intensive care, and the last two years, consequences of the pandemic have shown, that attending to the occupational health of intensive care medical staff is more necessary than ever. It is my sincere hope that psychological knowledge in some way can contribute to useful interventions for staff in intensive care.

For me personally, I'm happy I was given the opportunity to be a part of this project, and I'll will always be amazed by the work intensive care staff do. Looking back, I feel I've learned so much, and have so much to learn.

Stockholm, April 2022

Johan Holmberg



2 BACKGROUND

2.1 WORK-RELATED STRESS IN ICU STAFF

Intensive care has been observed to constitute an especially demanding work setting and studies evaluating the health of healthcare professionals (HCPs) in intensive care report high levels of burnout, traumatic stress, symptoms of anxiety, depression, and fatigue (Mealer et al., 2009, 2012; van Mol et al., 2015). Besides health concerns, negative work-related implications have been observed among staff that include e.g., turnover rates (Adriaenssens et al., 2015), intention to leave (Khan et al., 2019; Stone et al., 2006), and lowered work performance (van Mol et al., 2015). The elevated levels of unhealth are suggested to be related to the demands in intensive care, and stressors commonly identified by staff are conflicts with co-workers (Azoulay et al., 2009; Crickmore, 1987; Elshaer et al., 2018; Embriaco et al., 2007; Martins Pereira et al., 2016), conflicts with patients and/or families (Crickmore, 1987; Martins Pereira et al., 2016), workload (Crickmore, 1987; Embriaco et al., 2007; Vandevala et al., 2017), moral distress (Martins Pereira et al., 2016; Piers et al., 2011), and issues of life and death (Martins Pereira et al., 2016). Studies reporting on the prevalence of occupational health and research identifying the specific sources of health contribute to important knowledge that could improve development of interventions to intensive care.

Further analyses indicate that some stressors may be more important to address. In a multicentre study of 10 intensive care units (ICU) and 9 palliative care units, Martins Pereira et al. (2016) reduced the number variables that contributed to burnout (BO) by controlling for sociodemographic variables and educational characteristics. The most significant determinant of burnout syndrome was shown to be conflicts and having a post graduate education in intensive care was a protective factor. Conflicts in ICU has also been evaluated in an extensive study by Azoulay et al. (2009) who obtained data of perceived conflicts from 7,498 staff members from 323 ICUs in 24 countries. The study found that 70% of ICU staff experienced conflict during the last week, and perceived half of them as severe or dangerous. Intrateam conflicts accounted for the majority of conflicts. Also, poor communication, in general or during end-of-life care, was perceived as a common source of conflict. Authors conclude that the findings suggest the utility of conflict-prevention strategies in intensive care.

Notably, considerable differences in levels of distress reported at different intensive care units indicate a need for further analysis. In a systematic review including 40 studies van Mol et al. (2015), authors report a range of 0 to 70.1% in self-reported burnout assessed by Maslach Burnout Inventory (MBI). In addition to variation between units, there are also large variations in reported distress within units, also between health care staff working in the same positions who were exposed to similar stressors (McVicar, 2003; van Mol et al., 2015). Additionally, comparisons between intensive care and other medical specialities show inconclusive results where some studies report elevated levels of distress in intensive care (Martins Pereira et al., 2016), and some do not (Foxall et al., 1990; Kelly & Cross, 1985).

2.1.1 The effects of covid-19 pandemic on intensive care staff

In March 2020 the World Health Organization (WHO) declared the covid-19 outbreak a global pandemic. The pandemic brought an extraordinary challenge to societies and healthcare world-wide, and healthcare professionals (HCPs) at intensive care units (ICUs) worked at the frontline of this challenge. Concerns regarding the consequences of frontline work during the pandemic and potential long term adverse effects regarding the mental health of HCPs were raised early on and ICUs highlighted the need for support initiatives. Studies observing the occupational health of HCPs in frontline work report elevated levels of stress, anxiety, and depression (Luo et al., 2020; Salari et al., 2020). In a review covering 29 studies Salari et al. (2020) estimates the overall prevalence of stress among frontline health workers to 45 % (range 5.2-93.7), prevalence of anxiety to 25.8 % (range 0.6-57), and prevalence of depression to 24.3 % (range 0.6-61.1). Compared to prevalence in the general public, authors estimate their findings as reflecting high levels of stress, anxiety, and depression. A second systematic review by Luo et al. (2020) found 62 studies from 17 different countries and a total of 162.639 participants. They estimated a pooled prevalence of anxiety of 33 % and depression of 28 %. These systematic reviews conclude elevated levels of stress, anxiety and depression and raises concerns regarding the long-term consequences of these demands on healthcare professionals. The considerable range and variation in levels of occupational psychological health reported between studies calls for further exploration of these differences.

2.2 PSYCHOLOGICAL REACTIONS AND BEHAVIOURAL HEALTH

Categorizing and measuring psychological factors is a prerequisite to research, and reliable and valid measures are needed to enable evaluation of interventions developed to improve occupational psychological health. Besides contributing to evaluation, these psychological constructs can be helpful in explaining the large individual variation in levels of stress reported by healthcare staff, differences seen also between individuals working in similar situations with similar tasks (McVicar, 2003). Examples of these constructs are self-efficacy, personality constructs, coping skills, and motivation.

As a broad categorization the psychological factors investigated in studies I-III are divided in individual *risk* and *resilience* factors.

2.2.1 Individual risk factors

2.2.1.1 Occupational stress

Work-related stress has been identified as a major psychosocial hazard and is broadly defined as "... the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope" (WHO). The term stress was originally formulated by Selye in the 30s (Selye, 1936) and later defined from a psychological perspective by Lazarus and Folkman in the 60s, and the concept of stress is now widely used in occupational health and has attracted an impressive amount of research. Gardell (1982) early emphasized two important aspects of work-related stress, first that there may be a direct relationship between objective working conditions and physiological and psychological stress, and second that certain stress conditions may create fatigue and passivity and thus make it more difficult for

individual employees to actively involve themselves in changing those conditions. Additionally, occupational stress has been causally linked as a risk factor to major diseases like cardiovascular disease (Schnall et al., 2016). Occupational stress is one of the most common aspects of occupational psychological health reported, and in studies from intensive care settings occupational stress has been linked to several health-related consequences, such as depression, anxiety, traumatic stress, fatigue, and burnout (Embriaco et al., 2007; van Mol et al., 2015).

2.2.1.2 Depression and mental health

Depression is a common mental disorder and has been observed as one of the leading causes of disability world-wide (Global burden of disease study 2017; Smith, 2014). An overview of meta-analyses covering 500 randomized trials on psychotherapy for adult depression by Cuijpers (2017) found that all therapies are effective with no significant difference between therapies and recommend further research to focus on reduction of burden, prevention, treatment-resistant depression, relapse prevention, and scaling-up treatments. In intensive care settings, Embriaco et al. (2012) studied depression among intensivists and found that approximately 25 % exhibited signs of depression. Interestingly, authors found depression to be associated with workload and relationships with colleagues, but not with patients' severity of illness. Furthermore, a study by Garrouste-Orgeas et al. (2015) evaluating risk factors related to medical errors in ICU found depression to independently predict medical errors, while burnout or safety culture did not. Although major risk is associated with depression, the prevalence of mental health in general and depression specifically remains poorly studied within intensive care (Embriaco et al., 2012).

2.2.2 Individual resilience factors

Research on occupational psychological health has traditionally been dominated by a focus on distress, where most studies evaluate the occupational stress and burnout (BO) of employees. When these symptoms are gone, or levels are low, the health status are considered as good. There are, however, no perfect equivalence between the presence of distress and unhealth, or absence of distress and good health. A radically different perspective towards distress is the *resilience* perspective (Mealer et al., 2012), definitions often include formulations such as an ability to overcome adversity, or effective functioning, despite the exposure to stressful circumstances, and/or internal distress (Fletcher & Sarkar, 2013; Yu et al., 2019). Some definitions even name stress as a prerequisite to development and health. Resilience factors may play an important role in understanding the ability to effectively manage stress inherent in contexts such as intensive care. There are several examples of studies from critical care on resilience. A survey study on ICU nurses showed resilience to be independently related to lower prevalence of post-traumatic stress and burnout (Mealer et al., 2012) and a mediational analysis in a cross-sectional study in critical care (Arrogante & Aparicio-Zaldivar, 2017) support relevance of resilience in critical care context.

2.2.2.1 Psychological flexibility

Psychological flexibility (PF) is a construct developed within the tradition of contextual behavioural science and has been defined as an ability to act in accordance with personal

goals and values also in the presence of interfering psychological experiences (Hayes et al., 1999, 2005). Thus, PF does not concern the presence or absence of symptoms of distress, but rather the individual's resilience and ability to function well in the presence of distress. It has been further described with six interrelated processes which also could be targets of interventions: acceptance, defusion, contact with the present moment, self-as-context, values clarification, and committed action (Hayes et al., 2005).

PF is the target of treatment in Acceptance and Commitment Therapy (ACT; Hayes et al., 2005), and measures of PF have been shown to mediate outcomes in clinical trials in a variety of conditions such as chronic pain and anxiety (Hayes et al., 2013; Stockton et al., 2019). It has been argued that PF plays a significant role in psychological health (Kashdan & Rottenberg, 2010) and studies have shown an incremental utility of PF over traditional measures of distress (anxiety, depression, stress) in explaining functioning and impairment (Gloster et al., 2011). Authors argue that PF could possibly capture these aspects of mental health that otherwise would remain unexplained.

PF has also been studied in occupational settings (Bond & Flaxman, 2006; Brinkborg et al., 2011; Flaxman & Bond, 2010; Frögeli et al., 2015; Lloyd et al., 2013; Waters et al., 2018). An example is Lloyd et al., (2013) who investigated effects of an ACT intervention on burnout (MBI) and strain (GHQ-12) and the mediating effect of PF (AAQ-II) among employees from a government department. They found increases in PF to mediate decreased emotional exhaustion (EE, subscale of MBI) and decreases in emotional exhaustion to buffer against increases in depersonalization (subscale of MBI).

2.2.2.2 *Work engagement*

The predominant focus on ill-being in research has been questioned and attending to other aspects of health could result in novel interventions within occupational health (Jarden et al., 2018; Myers, 2000; Schaufeli & Salanova, 2011). Also, an exclusive focus on distress might not lead to important aspects of health. This has partly been illustrated during the last decades by research on Work Engagement (WE) (Bakker & Demerouti, 2008). WE is a construct used within positive psychology, which originally was viewed upon as the opposite of burnout. WE was defined as a "*positive, fulfilling, work-related state characterized by vigor, dedication, and absorption* (Schaufeli et al., 2002, p. 74)."

Studies on WE, particularly in nursing, have increased the last decade, resulting in several recent systematic reviews (e.g., Keyko et al., 2016; Knight et al., 2017, 2019; Lesener et al., 2019). Results from these studies show higher levels of WE to be associated with positive work-related outcomes, e.g., higher levels of job performance (Keyko et al., 2016), lower levels of intention to leave (De Simone et al., 2018; Wan et al., 2018), and higher levels of perceived work ability (Tomietto et al., 2019). There is yet a scarcity of studies exploring the relationship between PF and WE among health care professionals (Holmberg et al., 2019, 2020; Solms et al., 2019; Xu et al., 2018) and more research is needed to clarify the roles and utility of these constructs. One example from intensive care is van Mol et al. (2018) who studied work engagement among intensive care professionals and found it to counterbalance occupational stress. They conclude that ICU professionals high score on

work engagement can explain their low stress levels in a context where job demands are high. The cross-sectional design does not, however, allow for causal interpretations.

2.3 ASSESSMENT OF STRESS AND PSYCHOLOGICAL REACTIONS AMONG ICU STAFF

Occupational psychological health has traditionally been measured with self-report questionnaires, and the usefulness of these assessments depends on the quality of the questionnaire's psychometric characteristics, i.e., aspects of reliability and validity. In that sense, the variables are proxy variables, supposed to mirror the true variable. Since there is no true measure of psychological health, we used several measures that could contribute to different aspects of health. In the present thesis we used four measures: Perceived stress scale-10 (PSS-10); General Health Questionnaire-12 (GHQ-12); Utrecht Work Engagement Scale (UWES); and Work-related Acceptance and Action Scale (WAAQ).

2.3.1 Measures of individual risk factors

As measures of risk factors of stress and mental health, we used the Perceived Stress Scale-10 (PSS-10; Cohen et al., 1983) and the General Health Questionnaire (GHQ-12; Goldberg & Hillier, 1979). Both questionnaires have a long history of being used in occupational psychological health research and Swedish versions have been validated in a Swedish context (PSS-10 Nordin & Nordin, 2013) (GHQ-12; Lundin et al., 2017; Lundin & Dalman, 2020; Sconfienza, 1998).

2.3.1.1 Occupational stress

The first measure, PSS-10, represents a traditional stress perspective. The scale was developed in the 80s by Cohen et al (Cohen et al., 1983) to capture the subjective, appraisal process of stress, i.e., to what extent situations are perceived as stressful. Since they observed large individual differences in the stress appraisal of seemingly similar situations, the goal was to capture this variation in a psychological construct. Examples of items are: "In the last month, how often have you felt that you could not cope with all the things you had to do?", and "In the last month, how often have you felt that you were on top of things?". Items are rated on a Likert scale from never (0) to very often (4). The total score ranges from 0 to 40 with higher scores indicating greater levels of perceived stress. PSS-10 is validated in Swedish (Nordin & Nordin, 2013) on a sample from the general population and showed a Cronbach's alpha of 0.84.

2.3.1.2 Depression and mental health

The second measure, the GHQ-12, represents the perspective of mental health in general and more specifically depression. It was developed by Goldberg and Hillier (1979). The items included in GHQ-12 were chosen from a larger pool of questions, and the ones used in the final version of GHQ-12 were the ones that discriminated best between groups of clinical (psychiatric) and healthy cases. It was originally developed to detect psychiatric illness, primarily depression. GHQ-12 has since then also been used as a general measure of mental health and psychological distress. It consists of twelve items that reflect different aspects of health are rated on a Likert scale from 0 (strongly agree) to 3 (strongly disagree). Examples of specific items are "I have recently lost much sleep over worry" and "I have been thinking of myself as a worthless person." Different methods of scoring exist. The preferred method to use for comparison between groups is the Likert method which

provides a total score of 0 to 36. Higher scores indicated higher levels of distress. A study validating the Swedish version of the GHQ-12 in a general population reported a Cronbach's alpha of 0.83–0.89 (depending on scoring method) (Lundin et al., 2017).

2.3.2 Measures of individual resilience factors

To assess aspects of resilience, two different questionnaires were used in this project: Work-related Acceptance and Action Questionnaire (WAAQ) as a measure of psychological flexibility, and Utrecht work engagement scale (UWES) to measure work engagement.

2.3.2.1 Psychological flexibility

WAAQ was developed by Bond et al. (2013) as a context specific self-report questionnaire to measure psychological flexibility, the Work-related acceptance and action questionnaire (WAAQ) which has been translated and evaluated in Spanish (Ruiz & Odriozola-González, 2014), Chinese (Xu et al., 2018), and Swedish (Holmberg et al., 2019). WAAQ includes seven items rated on a Likert scale from 1 (Never true) to 7 (Always true), e.g., “I can admit to my mistakes at work and still be successful,” and “I can work effectively, even when I doubt myself.” WAAQ has a total score of 7 to 49, with higher scores indicating higher levels of psychological flexibility). The Swedish validation showed good internal consistency (Cronbach's alpha 0.85) and test-retest reliability (ICC 0.85).

2.3.2.2 Work engagement

UWES has been used for more than 15 years with several studies supporting its reliability and validity (Schaufeli & Bakker, 2004)). Work engagement can be defined as “a positive, fulfilling, work-related state characterized by vigor, dedication, and absorption” (Schaufeli et al., 2002, pp. 74). Examples of items in UWES are “I'm enthusiastic about my job,” and “When I get up in the morning, I feel like going to work.” UWES consists of 17 items rated on a Likert scale from 0 (never) to 6 (always/every day). The total score comprises the mean of the 17 items, with higher scores indicating higher levels of work engagement. Results from previous studies have suggested two possible factor solutions, with either one (work engagement) or three factors (vigor, dedication, and absorption) (Schaufeli & Bakker, 2004). A Swedish version of the UWES was validated in a sample of information communication technology consultants by Hallberg and Schaufeli (2006), who found the one-dimensional and three-dimensional representations of work engagement to be equivalent with adequate fit measures for both. Cronbach's alpha was 0.93 for the total score, 0.85 for vigor, 0.89 for dedication, and 0.76 for absorption. Cronbach's alpha in the present sample was 0.90 for the total score, 0.78 for vigor, 0.86 for dedication, and 0.74 for absorption.

2.4 SUPPORT FOR BEHAVIOURAL INTERVENTIONS

There is a scarcity of research studying interventions to improve occupational health in intensive care settings, resulting in a limited understanding of what is needed to support intensive care medical staff in performing their work effectively. Below, results from specific studies from intensive care settings are presented, as well as results from healthcare in general.

2.4.1 Empirically supported interventions in ICU

A majority of the studies evaluated in systematic reviews are based on interventions derived from Cognitive behavioural therapy (CBT). CBT-interventions has a long-standing evidence base within clinical psychology, which could probably inform interventions tried out within occupational psychological health. Importantly though, the contextual nature of psychological factors suggests a careful evaluation of interventions to achieve external validity and not assume effect in new contexts.

Evaluating stress management in intensive care settings, Alkhawaldeh et al. (2020) included 12 studies in a systematic review. The designs of the twelve studies were two randomized controlled trials, five single group pre-post intervention design with no comparison condition, and five quasi-experimental studies with non-random allocation to groups. Authors found CBT interventions (six studies) and mindfulness-based interventions (three studies) to be effective in reducing occupational stress. For interventions with single studies, they concluded that more research was needed (yoga, aroma therapy, and massage). Furthermore, authors conclude the review to demonstrate a need for more high-quality methodological studies. A second systematic review (van Mol et al., 2015), primarily studying the prevalence of compassion fatigue and burnout among intensive care staff, also investigated available preventive strategies. Authors found ten studies that evaluated the effect of an intervention, and seven studies that suggested preventive strategies. where seven trials were evaluating organization-directed interventions, and thirteen trials focused on person-directed interventions. Authors suggest policy makers to introduce preventive interventions to reduce negative consequences of emotional distress. They do not specify any recommendations based on their findings but report on several encouraging strategies and mention communication skills, ethical rounds, and mindfulness.

Besides studies performed in intensive care, studies from other healthcare disciplines in general could contribute to knowledge of possible effects of interventions. A comprehensive review of studies of interventions directed at preventing occupational stress among healthcare professionals in general was done by Ruotsalainen et al. (2015) who selected 58 studies with a total sample of 7188 participants. Included study designs were 54 randomised controlled trials (RCT) and 4 controlled before-and-after studies (CBA). The interventions were categorized as CBT, mental and physical relaxation, combined CBT and relaxation, and organizational interventions. Outcomes were categorized as stress, anxiety or general health. Authors concluded that CBT and mental and physical relaxation reduces stress more than no intervention but not more than alternative interventions. Among organizational interventions they conclude that changing work schedules may reduce stress and other interventions to have no effect on stress. All evidence was considered being of low quality, due to problems with e.g., attrition, relatively few participants in trials, low quality reporting of random number generation and allocation concealment during randomization, missing power calculation, and the solution of using staff from one unit set up in an intervention group and one control group. They advise future studies to be randomized controlled trials with at least 120 participants and organizational interventions to focus on reduction of specific stressors. A second review, by Richardson and Rothstein (2008) showed more positive results. They did a meta-analysis of effects of occupational stress management intervention programs where 36 studies

(N=2847) were included. Participants professions were mixed and included office workers, teachers, nurses and hospital staff, factory workers, maintenance personnel, and social service staff. The overall weighted effect size was 0.526 (95 % confidence interval 0.364-0.687). Subgroup analysis based on industry sector showed an effect size of 0.492 (Cohens d) for the health sector. Included interventions were coded as CBT, relaxation, organizational, multimodal, or alternative and intervention type had a moderating role. CBT interventions (d=1.164) and alternative interventions (d=0.909) yielded the largest effect sizes. Both categories had substantial heterogeneity within subgroups (0.456-1.871 and 0.318-1.499 respectively). Further subgroup analysis consistently produced larger effect sizes for cognitive behavioural interventions. Author interpret results were due to the active confronting of problems usually inherent in cognitive behavioural interventions.

2.4.2 Communication Skills Training

Communication skills training (CST) have been shown to positively influence communication skills of healthcare professionals (Berkhof et al., 2015; Moore et al., 2013), aspects of patient health (Stewart, 1995), and the occupational health of healthcare professionals (Fallowfield & Jenkins, 2004; Quenot et al., 2012). Few studies exist and there is a general need for larger studies with improved methodology. A recurrent need mentioned in reviews are a standardized measures of skills which would enable comparison between interventions. A systematic review by Moore et al. (2013) investigated effects of Communication skills training (CST) for health care professionals working with patients who have cancer. This is by large the most common setting for communication skills studies in healthcare. They argue for importance of review since research show that communication skills do not reliably improve with experience and communication skills training should routinely be delivered to health care professionals. They included 15 studies in the review and concluded that CST appear to be effective in improving healthcare professional's communication skills related to information gathering and supportive skills. They found no evidence for CST having any effect on patients mental, physical needs, satisfaction or on healthcare professionals' symptoms of burnout. Neither did their review favor any method of CST above another. Another review of 12 systematic reviews focused on CST given to physicians (Berkhof et al., 2015) found role-play, feedback and small group discussions to be effective strategies for learning. They also recommend training to extend for at least one day and found evidence for a learner-focused, practice-oriented approach. Outcome measures used in reviews varied and six of the twelve studies had poorly specified or integrated outcomes. Type of outcomes were behavioural observations, physician-based outcomes, and patient-based outcomes. Another review focusing on patient health outcome related to physician-patient communication (Stewart, 1995) found 21 studies where results showed 16 studies where effective communication improved patient health, 4 with negative results and 1 study with inconclusive results.

Studies from intensive care are few but some exist. In the systematic review by van Mol et al. (2015) three studies described interventions targeting improved communication within intensive care, e.g., Loiselle et al. (2012), Quenot et al. (2012), and Sluiter et al., (2005) (See Table 1.). Quenot et al. (2012) studied effects of an intensive communication strategy on burnout among carers in a longitudinal pre post evaluation of critical care (N=62) and found significant reduction in burnout syndrome according to MBI (28%-14 %) and

depression according to Centre for epidemiologic depression scale (CES-D; 9%-3%). Loiselle et al., (2012) found positive effects in increased well-being and performance after an information and support programme for patients, family members, and nurses focused on improved communication. Finally, Sluiter et al. (2005) found significant decrease in emotional exhaustion among staff after the introduction of multidisciplinary work shift evaluations focused on communication.

Table 1. Studies evaluating effects of communication-based interventions on occupational psychological health.

Study	Study design	Design summary	Brief description of intervention	Result summary
Loiselle et al., 2012	Pre-post, uncontrolled trial	A pre-experimental mixed design using quantitative and qualitative (focus group) methods	Information and support programme for patients, family members, and nurses	Significantly reduction in measures of physical and mental effort, observed trends in higher performance satisfaction and lower emotional distress
Quenot et al., 2012	Pre-post, uncontrolled trial	Longitudinal, monocentric, before-and-after, interventional study	Intensive communication strategy primarily addressing end-of-life issues	Significant reduction in rate of burnout (MBI) and depression (CES-D)
Sluiter et al., 2005	Pre-post, uncontrolled trial	Prospective, repeated measurements design, comparison of pre/post measurements and process measures	Multidisciplinary structured work shift evaluations and training of interpersonal communication skills	Significant decrease in emotional exhaustion, no change in work-related fatigue

2.4.3 Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT) was developed as a separate form of CBT, influenced by learning theory and behaviour analysis. Research on ACT and psychological flexibility in the field of occupational health is yet scarce, but some studies exist. These studies show the potential of using interventions based on ACT in work settings. A systematic review by Öst (2014) of existing studies for acceptance and commitment therapy found ACT to be possibly efficacious for stress at work according to criteria established by APA Division 12 Task Force. Criteria for possibly efficacious were at least one good study showing the treatment to be efficacious in the absence of conflicting evidence. An updated review has not been done yet. Specific examples from occupational health are Flaxman and Bond (2010), who found psychological flexibility but not cognitive content to explain change in general psychological distress (general health questionnaire, GHQ-12). This was done in an intervention study where authors randomized 107 workers to one of three conditions, acceptance and commitment therapy (ACT), stress inoculations training (SIT) and waitlist control. Psychological flexibility as measured by Acceptance and Action Questionnaire (AAQ) and cognitive content as measured by Dysfunctional attitude scale (DAS) was both tried as mediators and AAQ was found to mediate change in the ACT condition. Even though hypothesized to mediate change in the SIT condition, DAS was not found to mediate change in any condition. The effect of ACT and SIT compared to control was both significant. Lloyd et al. (2013) studied effects on employees from a government department and found increases in psychological flexibility to mediate decreased emotional

exhaustion (EE, subscale of MBI), and decreases in emotional exhaustion to buffer against increases in depersonalisation (DP, subscale of MBI).

A few examples of studies of interventions in healthcare based on ACT exist. Frögeli et al. (2015) studied the effect of ACT on stress among nurse students and found change in psychological flexibility, as measured by Avoidance and fusion questionnaire for youth (AFQ-Y) and Mindful awareness attention scale (MAAS), to predict change in stress (PSS-10) and the burnout subscale (BO) of Scale of work engagement and burnout (SWEBO). Method of analysis was path analysis of baseline-post intervention two-mediator model. Further examples from healthcare were done by Waters et al. (2018) who tested mediating effect of process measures in a quasi-controlled trial where an intervention of one-day ACT workshop were shown to decrease levels of general mental distress, as measured by GHQ-12, in a sample of health care employees (N=35). As process measures, authors used the Acceptance and action questionnaire (AAQ), Five facets of mindfulness questionnaire (FFMQ) and Automatic thoughts questionnaire (ATQ). AAQ and FFMQ were significantly improved by intervention. Authors found the subscales of observing and non-reactivity on FFMQ to be associated with reduced distress in the ACT condition. Brinkborg et al., (2011) studied the effect of acceptance and commitment therapy (ACT) on primary outcome of Perceived Stress scale (PSS-10) and General Health Questionnaire (GHQ-12) and secondary outcome of Maslach Burnout Inventory (MBI) among social workers (N=106). Authors found ACT to reduce levels of distress (PSS-10, GHQ-12) compared to control condition. There was no main effect of intervention on AAQ, but authors did exploratory correlations between change on AAQ from pre to post and changes in outcome scores and found AAQ to correlate with PSS-10, GHQ-12, MBI, Pbse and DCSQ (Demand Control Support Questionnaire).

2.5 IMPLEMENTATION OF SUPPORT TO ICU STAFF

During the pandemic, healthcare organizations have tried to provide support to staff. Due to uncertainty regarding e.g., the magnitude and course of the pandemic, implementing support interventions has proven difficult (Muller et al., 2020). Additionally, knowledge of implementation shows that the feasibility of interventions affects in what extent support are used by staff, regardless of access. Thus, for optimal effect, not just the level of evidence but also aspects of feasibility should be considered when tailoring support to staff.

Implementation of empirically supported interventions is a key challenge to health care development. A systematic review by Flottorp et al., (2013) show determinants of practice that could enable or prevent change and synthesized 12 checklists into 57 determinants grouped in seven domains: guidelines factors, individual healthcare professionals' factors, patient factors, professional interactions, incentives and resources, capacity for organizational change, and social, political and legal factors. The extent to which these factors are taken into account are hypothesized to determine change.

Interventions delivered to support healthcare professionals during the covid-19 pandemic illustrate specific difficulties of implementation. A systematic review by Muller et al. (2020) found six studies reporting on implementing interventions to intensive care units during the covid-19 pandemic. Authors found a possible mismatch between the need of HCP and the focus of the interventions delivered. While a minority of HCPs were interested in professional support, the majority of interventions focused on relieving

distress at an individual level. Instead, HCPs showed interest in social support to relieve distress, and authors suggest a focus on collegial and organizational factors. The individual focus might also hinder discovery of important organizational factors contributing to distress. This observation was also reported by Chen et al. (2020).

2.6 DEVELOPMENT OF INTERVENTIONS TO INTENSIVE CARE

Two interventions were developed and delivered to intensive care as part of the present research project, a Behavioural Skills Training program (BST) delivered to an ICU in 2015/2016, and a psychological support model delivered to an ICU during the first wave of the Covid-19 pandemic in 2020. Prior to implementation the interventions were discussed, organized, and planned in cooperation with management at each site.

2.6.1 Behavioural Skills Training program (BST)

The BST program was based on interventions from Cognitive Behavioural Therapy (CBT; O’Donohue & Fisher, 2009), Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), and Motivational Interviewing (MI; Miller & Rollnick, 2012). It consisted of one full-day lecture (six hours) in a large group format, followed by three two-hour small group sessions (approximately ten participants) enabling participants to work on assignments focused on work-related communication between sessions. The full program was delivered within three months at the hospital to facilitate participation. For logistic reasons (i.e., parts of the staff were always on duty) the entire work force was divided into two separate groups which received the intervention sequentially, see Fig. 1.

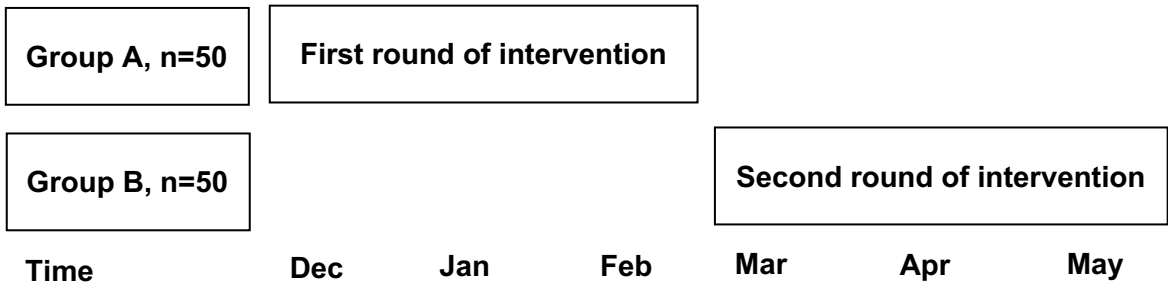


Figure 1. Description of each data collection point during delivery of intervention to the two groups, A and B.

The full-day lecture covered basic aspects of behaviour change, key communication skills and also provided opportunities for applying these skills in role plays. To achieve learning of specific skills, role plays were used to facilitate experiential learning that included emotional, cognitive as well as behavioural features. During the subsequent supervision, participants were encouraged to discuss communication problems occurring in their work settings as well as strategies to address them. More specifically the training consisted of: (1) values clarification in relation to patients and colleagues, (2) experiential avoidance and analysing the consequences of avoidance behaviour in relation to work-related discomfort, and (3) communication skills training. See Figure 2. and Appendix A of study III for content and structure of the Behavioural Skills Training programme.

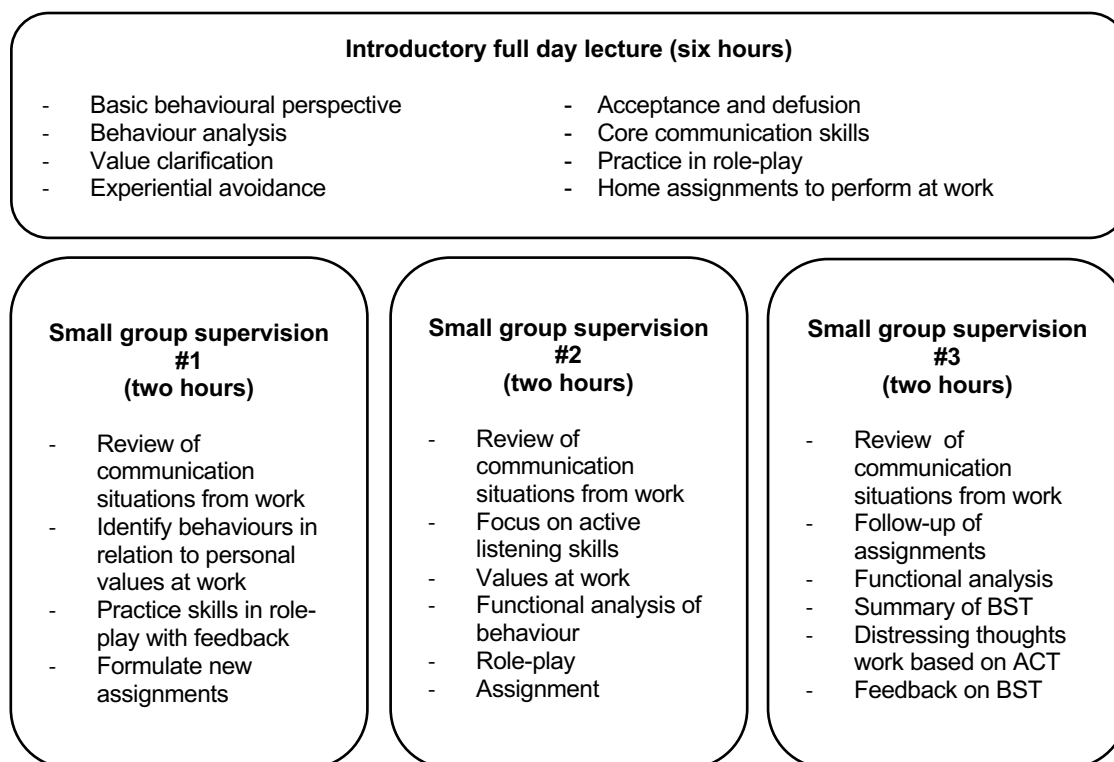


Figure 2. Content and structure of Behaviour Skills Training (BST).

Values clarification. During intervention the participants were given the opportunity to formulate and share personal values in relation to patients, relatives, and colleagues. *Value clarification* is a central process of ACT where you try to formulate what really matters to you in different areas of your life. Examples of values were “Its important for me to be supportive” or “I value cooperation in our team”. This also enabled a further exploration of specific behavioural goals reflecting the chosen values. Beside the individual focus of value clarification, the sharing of values as well as specific goals and behaviours within the team was an opportunity for important team building, social reinforcement, and inspiration. The supervising psychologist structured and facilitated the process.

Experiential avoidance. Experiential avoidance was used as an explanation of certain aspects of human functioning, in general and at work. Participants were encouraged to observe their own tendency to avoidance in relation to communication with colleagues, patients, and their relatives. An example of avoidance could be to avoid asking for help because you do not want to bother a colleague or because it would trigger thoughts of incompetence and related feelings. Experiential avoidance could be described as a general tendency suppress internal unwanted internal experiences, such as thoughts, feelings, memories, or bodily sensations. During group sessions, all expressions of examples of avoidance were validated to encourage sharing of examples and further raise awareness of participants avoidance. Validating avoidance was especially important since sharing such behaviours often was an act of vulnerability and courage. This emphasizes the *acceptance* part of ACT because it promotes more psychological flexibility in the presence of internal unwanted experiences. The specific avoidance was also discussed in terms of the short-term and long-term consequences, and participants personal values.

Behavioural skills training. Five specific skills were trained during intervention. The specific skills were active listening/validation, show appreciation, asking for help, assertiveness training/how to say no, and sharing of mistakes at work. A short structure for each skill were given to participants and a discussion regarding the usefulness of skills were encouraged. Skills were trained in roleplays performed in pairs in small group supervision sessions. This facilitated experiential learning that included emotional, cognitive as well as behavioural features. The participants were encouraged to find communication examples from work they could use, try skills out in a role play structure/format, and to give each other's feedback on specific instances of the role plays they found useful.

2.6.2 Psychological support model delivered to ICU during Covid-19

In March 2020, the first patients affected by the virus arrived at ICU at Capio S:t Göran, an emergency hospital in the Stockholm region. Due to extreme demands on staff during this first wave of the covid-19 pandemic, a psychological support model was rapidly developed and implemented at the anesthesiology clinic, including the ICU.

The psychological support model included education and training, peer support, psychologist-supervised and unsupervised group sessions, on-boarding for transferred staff, manager support, and individual sessions for workers experiencing strong stress reactions. An overview of the different interventions is shown in Figure 3.

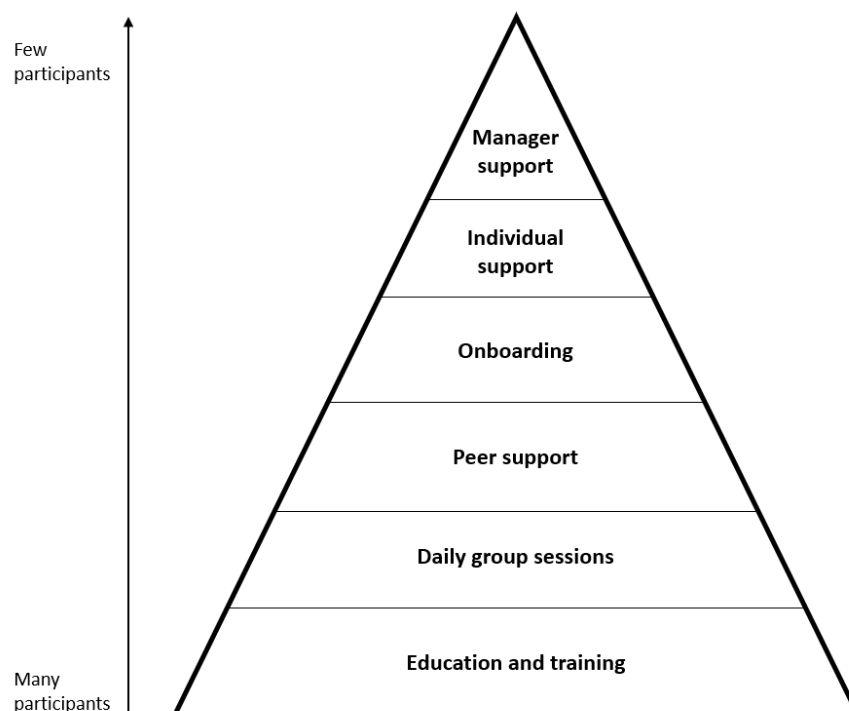


Figure 3. Overview of the different interventions in the psychological support model, organised by the number of the staff that were invited to participate in each of the initiatives.

The model consisted of several guiding principles and key interventions. (1) It was built on the *current needs* and feasibility in this specific context, in contrast to using standardized interventions tested in other settings, and had an agile approach (Wilson et al., 2018) with continuous modifications based on feedback and ongoing discussions with managers. (2) It was *integrated* into clinical routines, (3) based on well-established knowledge from organisational and occupational psychology and a contextual behavioural *theoretical framework*, (4) *resilience* was promoted by protecting physical resources (sleep and recovery) social resources (social support networks), and psychological resources (competence and autonomy), and (5) the inclusion of a *variety* of support activities at different levels.

3 RESEARCH AIMS

The overall purpose of this research project was threefold; to improve the knowledge on occupational psychological health among healthcare staff, particularly in intensive care settings, to develop a behavioural intervention to improve communication skills and management of distress to enhance occupational health, and to evaluate the implementation of psychological support to ICU staff. The specific aims of each study were as follows.

3.1 STUDY I

To evaluate reliability and validity of the Work-related Acceptance and Action Questionnaire (WAAQ), a self-report questionnaire measuring psychological flexibility at work, in a sample of healthcare professionals.

3.2 STUDY II

To evaluate the relationship between psychological flexibility (measured by WAAQ) and other aspects of occupational psychological health, i.e., perceived stress (Perceived Stress Scale-10), general mental health (General Health Questionnaire-12), and work engagement (Utrecht Work Engagement Scale), in a sample of intensive care medical staff. More specifically the indirect effect of WAAQ on the relationship between PSS-10 and UWES was tested, as well as the indirect effect of WAAQ on the relationship between GHQ-12 and UWES.

3.3 STUDY III

To preliminary evaluate the effects of a Behavioural Skills Training program on dependent measures of occupational psychological health (PSS-10, GHQ-12, WAAQ, and UWES) in a sample of intensive care medical staff.

3.4 STUDY IV

To evaluate implementation and feasibility of a psychological support model rapidly developed and implemented for ICU staff during the first wave of the covid-19 pandemic.

4 EMPIRICAL STUDIES

Four studies were included in the present thesis. Background, methods, results, and conclusion for each separate study are briefly presented below, and the full studies are found in the second half of the thesis. For an overview of the studies, see Table 2.

Table 2. Overview of studies I-IV, including design, participants, data collection, and statistical analyses.

Study	Design	Participants	Data collection	Statistical analyses
I	Cross-sectional, longitudinal	184 28	WAAQ, UWES, PSS-10,	Principal component analysis, Cronbach's alpha, Intra Class Correlation, bivariate correlation
II	Cross-sectional, longitudinal	144 46	WAAQ, UWES, PSS-10 GHQ-12	Bivariate correlation, hierarchical linear regression, mediational analysis of indirect effects, linear mixed model analysis
III	Pre-post, uncontrolled trial	100	WAAQ, UWES, PSS-10 GHQ-12	Dependent t-test, Cohens d, linear mixed model analysis
IV	Cross-sectional qualitative	129	Questionnaire, Interviews with psychologists delivering interventions, staff attendance at specific support efforts	-

Note: WAAQ (Work-related Acceptance and Action Questionnaire), UWES (Utrecht Work Engagement Scale), PSS-10 (Perceived Stress Scale-10), GHQ-12 (General Health Questionnaire-12)

4.1 STUDY I: EVALUATING WAAQ IN HEALTHCARE PROFESSIONALS

4.1.1 Background

Psychological flexibility has been suggested to be a central and fundamental aspect of health (Hayes et al., 2013; Kashdan & Rottenberg, 2010). The construct was formulated and developed within the tradition of Acceptance and Commitment Therapy and shown to be a possible mechanism of change and target for interventions (Hayes et al., 2013; Stockton et al., 2019). Addressing occupational, work-related settings, Bond et al., (2013) developed and evaluated a contextually sensitive questionnaire to measure psychological flexibility at work, which resulted in the Work-related Acceptance and Action Questionnaire (WAAQ). The aim of Study I was to evaluate reliability and validity of a Swedish translation of WAAQ.

4.1.2 Methods

The study primarily had a cross-sectional design and included 184 participants/healthcare professionals ($n = 184$). In addition, a longitudinal design was used in the test-retest analysis with a subsample of 20 participants ($n = 28$).

Data used in the study consisted of three self-report questionnaires covering different aspects of work-related health i.e., the Work-related Acceptance and Action Questionnaire

(WAAQ), the Perceived Stress Scale-10 (PSS-10), and the Utrecht work engagement Scale (UWES). Additionally, demographics variables on profession, years of work-experience, age, and genus were collected.

In the statistical analyses we used a Principal Component Analysis (PCA) to evaluate dimensionality of the scale, Cronbach's alpha was used to calculate internal consistency and Intra Class Correlation (ICC) to calculate test-retest reliability of the questionnaire. Concurrent validity analyses were evaluated by bivariate correlation between WAAQ and other work-related constructs of occupational psychological health, PSS-10 as a measure of occupational stress, and UWES as a measure of Work engagement.

4.1.3 Results

The results of the PCA supported retaining only one component due to low explanatory power of the second. Reliability analysis showed WAAQ to have good internally consistency with a Cronbach's alpha of 0.85, and the test-retest analysis showed an ICC of 0.85 which supports the repeatability of WAAQ. Finally, WAAQ showed concurrent validity as measured by a negative bivariate correlation with perceived stress (PSS-10, $r_s(181) = -0.22, p < .003$) and a positive bivariate correlation with work engagement (UWES, $r_s(181) = 0.28, p < .0005$).

4.1.4 Conclusion

The results were consistent with previous research, and we concluded that the evaluation support the use of the Swedish version of WAAQ as a measure of psychological flexibility among healthcare professionals and, considering the sample composition, particularly highly educated female healthcare professionals.

4.2 STUDY II: PSYCHOLOGICAL FLEXIBILITY IN INTENSIVE CARE

4.2.1 Background

Intensive care settings place specific work-related demands on healthcare professionals, and these demands have been shown to result in both health- and work-related negative consequences (Mealer et al., 2009, 2012; van Mol et al., 2015). Psychological flexibility is suggested as a useful construct when addressing occupational psychological health, especially in work settings with high demands. It is characterized by *openness* to internal experiences such as feelings and thoughts, *present moment awareness* of the here and now, and an ability to *engage* in behaviours according to chosen personal values and goals (Hayes et al., 2005). Resilience. The aim of study II was to evaluate the relationship between psychological flexibility, work engagement, perceived stress, and general mental health, in a sample of intensive care medical staff.

4.2.2 Methods

The study had a cross-sectional design and the sample included two separate units, one adult (ICU) with 98 participants and one paediatric (PICU) with 46 participants, in total 144 participants ($n = 144$). One analysis had a longitudinal design with three repeated measures and was performed on the PICU-subsample ($n = 46$).

Data consisted of four self-report questionnaires measuring different aspects of occupational psychological health: the Perceived Stress Scale-10 (PSS-10), the General Health Questionnaire-12 (GHQ-12), the Work-related Acceptance and Action Questionnaire (WAAQ), and Utrecht Work Engagement Scale (UWES). Demographic variables collected were profession, years of work experience, age, and genus.

Statistical analyses in the study included bivariate correlation between variables to assess strength and direction of relationship, hierarchical regression analyses to assess the variance in UWES explained by WAAQ with and without controlling for PSS-10 and GHQ-12, a cross-sectional mediation analyses of the indirect effect of WAAQ first on the relationship between PSS-10 and UWES, and second on the relationship between GHQ-12 and UWES. Finally, a linear mixed model analysis was performed on a subsample (PICU, $n = 46$) with three repeated measures to evaluate change in UWES over time in a longitudinal design and its relationship to change in WAAQ.

4.2.3 Results

Results of the initial bivariate correlation analyses showed that WAAQ had a significant positive correlation with UWES ($r_s = .34, p < .001$), and a significant negative correlation with PSS-10 ($r_s = -.37, p < .001$) and GHQ-12 ($r_s = -.34, p < .001$). The Hierarchical regression analyses showed that WAAQ explained 16.9 % of the variance in UWES. When controlling for PSS-10 and GHQ-12, WAAQ explained 6.4 % of variance in UWES. A significant indirect effect was seen in the relationship between PSS-10 ($ab = -0.0108$, 95% CI $[-0.0219 - -0.0019]$) and UWES ($ab = -0.0139$, 95% CI $[-0.0267 - -0.0041]$), as well as in the relationship between GHQ-12 and UWES. Finally, the linear mixed model analysis showed increases in PSS-10 to be significantly associated with decreases in UWES ($\beta = -0.055, p < .001$), and that increase in WAAQ were significantly associated with increases in UWES ($\beta = 0.022, p < .05$).

4.2.4 Conclusion

In conclusion, the results of the study provide preliminary support for the utility of psychological flexibility and work engagement to assess and characterize occupational psychological health among intensive care medical staff. Although tentative, the present findings indicate that psychological flexibility may be a meaningful target for interventions aimed at improving work engagement.

4.3 STUDY III: COMMUNICATION SKILLS TRAINING IN INTENSIVE CARE

4.3.1 Background

The nature of intensive care work has been observed to affect the occupational psychological health of intensive care medical staff negatively (Mealer et al., 2009, 2012; van Mol et al., 2015). Main stressors identified by staff are workload, moral distress, issues of life and death, and interpersonal conflicts with co-workers, patients, and relatives (Azoulay et al., 2009; Crickmore, 1987; Elshaer et al., 2018; Embriaco et al., 2007; Martins Pereira et al., 2016). The aim of the present study was to evaluate the effects of a novel Behavioral Skills Training program (BST).

4.3.2 Methods

100 intensive care medical staff ($n = 100$) from one ICU located at a Swedish hospital were included in the study. The sample consisted mainly of nurses ($n = 53$) and assistant nurses ($n = 33$). The study was an uncontrolled clinical trial with three repeated observations at pre, mid, and post intervention. The intervention was a novel Behavioural Skills Training program, based on interventions from Cognitive Behavioural Therapy (CBT; O'Donohue & Fisher, 2009), Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), and Motivational Interviewing (MI; Miller & Rollnick, 2012). It consisted of one full-day lecture (six hours) in a large group format, followed by three two-hour small group sessions (approximately ten participants). See Figure 2. and Appendix A of study III for a description of content and structure of program. Data consisted of four self-report questionnaires measuring different aspects of occupational psychological health, i.e., PSS-10, GHQ-12, WAAQ, and UWES. Statistical analyses to evaluate effects of interventions were dependent t-test, Cohen's d , and linear mixed model analysis. A linear mixed model analysis of three repeated measures enabled an evaluation of the influence of individual differences (intercept and slope) and increased sample since assumptions of analysis allowed for inclusion of cases with missing data.

4.3.3 Results

Results from analyses with dependent t-test showed significant change in occupational psychological health in levels of PSS-10 () and GHQ-12 (). Change in levels of WAAQ and UWES was small and non-significant. The change in PSS-10 and GHQ-12 corresponded to a Cohen's d of 0.2 and 0.4 respectively. Furthermore, a linear mixed model of three repeated measures resulted in significantly improved fit with a random intercept model for PSS-10 where variation in intercept had a significant effect on change in PSS-10, and a random slope model for GHQ-12 where both intercept and slope had a significant effect on change in GHQ-12. Additionally, evaluation of influence of background variables showed years of work experience to.

4.3.4 Conclusion

Although tentative, the findings support the use of the BST program to promote occupational psychological health among intensive care medical staff and warrants further evaluations in larger studies with improved design.

4.4 STUDY IV: PSYCHOLOGICAL SUPPORT FOR HEALTHCARE WORKERS

4.4.1 Background

The demands of Covid-19 pandemic in intensive care highlighted the need for supportive interventions. This study aimed to evaluate the rapid implementation of a comprehensive psychological support model to ICU staff during the first wave of Covid-19 pandemic at an anesthesiology clinic in Stockholm, Sweden.

4.4.2 Methods

All staff from an anesthesiology clinic (including ICU, surgery, and anesthesiology) were invited to be part of the study. The psychological support model included education and training, peer support, psychologist-supervised and unsupervised group sessions, on-

boarding for transferred staff, manager support, and individual sessions for workers experiencing strong stress reactions.

Five principles guided the development of the structure and content of the interventions. They support was (1) based on the current needs and feasibility in that specific context, and developed using an agile approach, (2) integrated in clinical routines, (3) based on well-established knowledge from organisational and occupational psychology and a contextual behavioural theoretical framework, (4) focused on resilience to work-related stress, e.g. promoting restoration of physical resources (sleep and recovery) social resources (social support networks), and psychological resources (competence and autonomy), and (5) the inclusion of a variety of activities to meet different needs among the staff.

Evaluation of the support model was carried out with three different sources of data: (1) a questionnaire administered to staff and managers at the anesthesiology clinics (ICU, surgery, and anesthesiology clinics), (2) an analysis of reports completed by staff during the unsupervised group sessions, and (3) interviews with psychologist delivering the support.

4.4.3 Results

123 employees out of 329 answered the questionnaire. A participation ratio, measuring attendance to specific support efforts in relation to awareness of all support efforts delivered, was calculated for each specific support effort. Although all support efforts were used, daily group sessions followed by peer support had the highest attendance ratings in relation to awareness. Furthermore, 79 % participated in daily group sessions and 85 % of these also participated in other support efforts at some point.

A total of 96 group sessions (two daily sessions) were carried out from May to August with a mean attendance of 5 participants (range = 2-14) per session. Unsupervised sessions were rated with participants experience of meaningfulness on a scale from 1-10. Summarized ratings showed that 36.5 % rated sessions with high (8-10), 39.6 % moderate (4-7), and 10 % low (0-3) meaningfulness.

Five interviews with psychologists delivering the support were transcribed and analysed with thematic analysis. Three separate themes emerged, and they were labelled *utility*, *challenges*, and *keys to implementation*. The *utility* theme was exemplified by (1) observations of the positive effects of daily group sessions on participants prosocial behaviour and communication, (2) the opportunity for managers to receive separate support with possibility to discuss matters related to their position as managers, and (3) the possibility of supervised group sessions to facilitate seeking of individual support. The *challenges* theme included (1) observations that timing of sessions were critical in relation to discussions in-session, where after work sessions had more discussions than session occurring before work shift, (2) that continuity and follow-up was not possible due to exchange of participants and therapist between session, and content and structure of sessions had to be adjusted to fit that format, (3) uncertainties of the pandemic induced uncertainty to the structure of the support, and also to the possibility of psychologists involved to plan and organise the support. The *keys to implementation* theme had examples such as (1) difficulties in engaging all staff group members in support efforts, (2) easy

access to support, (3) engagement and commitment of managers, (4) use of experienced psychologists in support efforts, (5) involving managers in planning and implementation enabled flexibility of support model.

4.4.4 Conclusion

The process evaluation of the psychological support model suggested the importance of a rapid implementation of support when needed, and that success is dependent on the managers to facilitate and implement the interventions, as well as access to competent resources (e.g., psychologists) at the affected site to deliver them. A future challenge for healthcare organisation is to establish in-house resources to deliver interventions targeting occupational psychological health.

5 ETHICAL CONSIDERATIONS

This research project included cross-sectional and longitudinal studies on risk and resilience factors among healthcare professionals, an intervention study to improve occupational psychological health, and a process evaluation of the implementation of a psychological support model during the covid-19 pandemic. The projects provide important knowledge about healthcare professionals in general, and intensive care staff in particular, given previous research showing elevated levels of distress and decreased general mental health.

Clinical research requires a number of ethical considerations. Each study was approved by The Swedish ethical review authority. The first three studies (I-III) are registered with dnr: 2014/42-31/3, 2015/1881-32-3, and the fourth study (IV) is registered with dnr: 2020-01795. Although the ethical considerations are mostly relevant to study I-III, since the process evaluation of the psychological support mode in study IV did not involve collection and storage of sensitive personal data/ information on occupational health.

5.1 PARTICIPANTS BENEFITS

Participants received a basic behavioural communication skills training which is considered useful in improving the ability to manage stressful situations at work. Participants received training also if they chose to not participate in the research study.

5.2 PATIENTS BENEFITS

When participants engage in skills training, they are trained in reflecting on their own avoidance behaviour, formulating their own goals for patient contact and also in their listening skills. These skills, if they find them useful, will likely help them communicate more effectively with colleagues, patients, and patients' family members. By this, the research project may be of indirect benefit also to patients and relatives.

5.3 COMMUNITY BENEFITS

The research project will contribute to the health care organisation through improvement in knowledge and methods directed at improving occupational health among healthcare professionals. Since communication skills training (CST) already often is a part of healthcare professions educational programs, knowledge about the effects of CST is important. Additionally, there are possible benefits in terms of improved occupational psychological health as a consequence of the intervention.

5.4 PARTICIPANTS BURDEN

All participants were told that they could participate in training regardless of participation in research. The extra time and effort related to participation in the study consisted of a set of questionnaires to fill out at each session. Time allotted for questionnaires was approximately 5-10 minutes. Since the training was given in large and small group format, it cannot be ignored that participants may have felt social pressure to participate, or not to participate, depending on their relations to colleagues. During data collection, written information regarding the study was administered, the participants' written consent was collected, the freedom of choice of participation was emphasized, and information regarding the possibility to withdraw at a later stage was given.

5.5 PARTICIPANTS RISK

5.5.1 Integrity

Integrity of the study participants is kept secure by storing data in electronic form at Karolinska Institute in accordance with ethical guidelines and ethical approval. Self-report questionnaires and recordings of role plays are stored in archives at Karolinska Sjukhuset, especially assigned to store research data. At the end of research period, the data will be finally archived at Karolinska Institutet. The code to identify research data and personal identifiable data is stored separate from data.

5.5.2 Training risk

Communication skills training involves role-play where participants try out different communication skills during intervention. This training can be emotional and personal. Trainers are experienced and competent in similar training and supervision and strive to ensure a safe learning environment. Trainers are also encouraged to elicit evaluative feedback from participants during training.

6 DISCUSSION

The overall purpose of this research project was threefold; to improve knowledge on occupational psychological health among healthcare staff, particularly in intensive care settings, to develop a behavioral intervention to improve communication skills and management of distress to enhance occupational health, and to evaluate the implementation of psychological support to ICU staff. The four specific studies included each add to different aspects of this common goal. Below, each study is discussed in relation to previous research, including strengths, limitations, and clinical implications.

6.1 IS THE SWEDISH VERSION OF WAAQ A RELIABLE AND VALID MEASURE OF PSYCHOLOGICAL FLEXIBILITY AMONG HEALTHCARE PROFESSIONALS?

Result from the study showed the psychometric properties of the Swedish version of WAAQ, in a sample of healthcare professionals, to be internally consistent with a good Cronbach's alpha of 0.85 and with good repeatability according to a test-retest reliability with ICC of 0.85. Additionally concurrent validity was shown with significant bivariate correlation to other work-related variables, i.e., perceived stress (PSS-10, $r_s = -0.22$), and work engagement (UWES, $r_s = 0.28$).

Results were consistent with previous studies evaluating WAAQ where similar relationship to other health-related variables had been observed (Bond et al., 2013; Ruiz & Odriozola-González, 2014; Xu et al., 2018).

Notably, in several studies (Rocheffort et al., 2018; Wolgast, 2014), and a narrative scoping review (Cherry et al., 2021) critique has been raised regarding validity of specific measures targeting psychological flexibility and some studies suggest the commonly used measure AAQ-II might not be a valid measure of psychological flexibility, but instead a general measure of distress. This discussion exemplifies the importance of studies evaluating reliability and validity of measures, and future studies should further evaluate WAAQ and its relationship to other measures of psychological flexibility such as Multidimensional Experiential Avoidance Questionnaire (MEAQ; Rocheffort et al., 2018), and Personalized Psychological Flexibility Index (PPFI; Kashdan et al., 2020), two measures who has been suggested to be more valid measures of psychological flexibility.

A few limitations should be considered when interpreting the results of the study. All variables included in the study consisted of self-report questionnaires. Behavioural work-related measures capturing work engagement or other health-related measures such as sick-leave, turn over, and work performance, and their relationship to WAAQ would improve validity. Additionally, the sample consisted of highly educated middle-aged female healthcare professionals, which should be kept in mind when generalizing the results to other populations.

Overall, the results from study I seems promising and support the utility of the Swedish version of WAAQ as a measure of psychological flexibility among healthcare

professionals. Future studies should further evaluate its validity in relation to other measures of psychological flexibility, and in relation to behavioural work-related measures.

6.2 WHAT IS THE RELATIONSHIP BETWEEN PSYCHOLOGICAL FLEXIBILITY, DISTRESS, AND WORK ENGAGEMENT IN A SAMPLE OF INTENSIVE CARE MEDICAL STAFF?

Main results from the study showed a significant indirect effect in a cross-sectional dataset of psychological flexibility (WAAQ) on the relationship between distress (PSS-10, GHQ-12) and work engagement (UWES) in a sample of intensive care medical staff.

Additionally, a significant relationship between levels of WAAQ and change in UWES was seen in a longitudinal subsample with three repeated measures.

Previous research shows the mediating role of psychological flexibility has been supported in several studies (Hayes et al., 2013; Stockton et al., 2019). Stockton et al., (2019) conclude that there is strong evidence to suggest that acceptance is a mechanism of change during ACT. Interestingly, Hayes et al. (2013) and Stockton et al. (2019) both raises critique towards the fact that studies focus only on some of the six processes of *psychological flexibility, acceptance, defusion, present moment awareness, self-as-context, values, and committed action*. Acceptance seems to attract most studies, while there is no study of self-as-context as a mediator. Furthermore, quality of evidence varies, and improved design are generally called for. Additionally, Stockton et al. (2019) emphasize that half of the studies included in their review did not achieve a minimum of 80 % statistical power and could consequently miss a significant mediator due to design problems.

In occupational settings, corresponding relationships between psychological flexibility, work engagement, and distress was observed in the first study using WAAQ (Bond et al., 2013) as well as in a Spanish sample by Ruiz and Odriozola-González (2014), among Swedish health care professionals (Holmberg et al., 2019), and Chinese oncology nurses (Xu et al., 2018). These studies show similar patterns, with stronger relationships between WAAQ and UWES subscales *Vigor* and *Dedication*, and a weaker relationship with the subscale *Absorption*. Bond et al. (2013) found WAAQ to have incremental validity over personality constructs measured with the Big Five Aspects Scale (BFAS). Results from this study add to those results by also showing WAAQ to have incremental validity over distress, as measured by PSS-10 and GHQ-12. This is the first study examining indirect effects of WAAQ on the relationship between distress and work engagement. Although tentative, the present findings are consistent with results from intervention studies with a focus on work engagement (Knight et al., 2017, 2019), showing the utility of interventions targeting personal resources/qualities.

This study had several limitations. Results from cross-sectional analyses of indirect effects cannot be assumed to be consistent with longitudinal data, as suggested by as shown by e.g., Cain et al. (2018), Maxwell et al. (2011), and O’Laughlin et al. (2018). Results should be replicated in longitudinal designs, and also in experimental designs where the supposed mediator is manipulated. Furthermore, although the longitudinal analysis with LMM evaluates relationship between variables over time, causality cannot be inferred from this

since the present study design lacks experimental qualities as randomization and manipulation of target variable. Additionally, samples should ideally represent the population to whom the results are subsequently generalized. In this study the PICU subsample is more incomplete (response rate 44%) than the ICU subsample (response rate 78%), and more susceptible to selection bias. Regarding subgroup analysis, some professions are not sufficiently represented to enable subgroup analyses and explore possible moderation. The present findings should primarily be generalized to populations of nurses and assistant nurses due to the composition of the study sample with a majority of these professions present. Finally, estimation of the size of the indirect effect, to clearer assess the clinical meaningfulness of this effect are difficult. Partially and completely standardized effects can give some information of size (Hayes, 2018), but sizes of indirect effects are often small, and there are yet no standards for reporting effect sizes (MacKinnon et al., 2007). Some have suggested samples of $N > 500$ to reliably evaluate the effect sizes in similar analyses (MacKinnon et al., 2007).

To conclude, although tentative, results from study II supports the utility of psychological flexibility and work engagement to assess occupational psychological health among intensive care medical staff. The results should be further evaluated in longitudinal designs with manipulation of target variable.

6.3 DOES THE BEHAVIOURAL SKILLS TRAINING (BST) IMPROVE OCCUPATIONAL PSYCHOLOGICAL HEALTH AMONG INTENSIVE CARE MEDICAL STAFF?

Analyses of change in occupational psychological health during intervention showed significant differences in measures of perceived stress (PSS-10) and general mental health (GHQ-12). This was observed in analyses with dependent t-test of change from pre to post measures as well as linear mixed model analyses with three repeated measures. Additionally, there was a significantly improved fit of data with a random intercept model for PSS-10, and a random slope model for GHQ-12, which indicate the importance of taking individual variation into consideration. Significance of a random intercept model for PSS-10 showed that individual differences in pre intervention measures varied significantly for PSS-10, and significance of a random slope model for GHQ-12 showed that individual differences varied significantly in pre intervention levels as well as slopes of change. No change was observed in dependent measures of psychological flexibility (WAAQ) or work engagement (UWES). Notably, pre intervention levels of occupational psychological health in the present study were within normal range when compared with to levels observed in normative data of PSS-10 (Nordin & Nordin, 2013), GHQ-12 (Cohen & Williamson, 1988), and UWES (Hallberg & Schaufeli, 2006).

The results from this study support findings from previous research suggesting the utility of communication skills training to improve occupational psychological health (van Mol et al., 2015). In short, positive effects have been observed in e.g., increased well-being and performance (Loiselle et al., 2012), reduction in burnout and depression (Quenot et al., 2012), and decreased emotional exhaustion (Sluiter et al., 2005). These studies all lack a control condition and therefore provide only tentative evaluations of the interventions. Similarly, the present study was carried out without a proper control condition, which

prevents any conclusions regarding causal effects of the intervention. Thus, findings may be due to factors such as seasonal variation in workload, or organisational changes. Additional studies with improved design, e.g., placebo-like control conditions and randomization of participants, are needed to validate these findings. Furthermore, the size of subgroups for different professions was too small to conduct subgroup analyses, which should be addressed in future studies. Additionally, the lack of long-term follow-up assessment prevents evaluation of sustained effects of the intervention. Yet, the recruitment of all employees from a specific unit rather than a selected or self-selected part of the work force increases the ecological validity and generalizability of the findings. Additionally, repeated measures with three assessment points and the use of LMM analysis, enabled all participants with at least one assessment points to be included in the analyses, which improved representativity of the sample.

To conclude, study III adds to the scarce body of research addressing occupational psychological health within intensive care. Although tentative, results support the utility of the Behavioural skills training program to address occupational stress and general mental health among intensive care medical staff.

6.4 WHAT ASPECTS OF IMPLEMENTATION IS SUGGESTED BY A PROCESS EVALUATION OF THE PSYCHOLOGICAL SUPPORT MODEL DELIVERED TO ICU DURING COVID-19?

The process evaluation of a psychological support model delivered to intensive care medical staff during the Covid-19 pandemic suggests the usefulness of a rapid implementation to current needs implying that support is built on readily available resources within the affected organisation. The importance of continuous adaptation to change in the needs of participants was also highlighted by psychologists delivering support. Psychologist reported a difficulty in reaching all subgroups of professions and the utility in providing support directed specifically to different professions. Difficulties in reaching out to staff emphasized the significance of support from first-line management in the planning and organisation of feasible, adequate support. In terms of participation rate, group reflections and peer support were most successful. The integration of these activities needed the support and engagement from managers as well as leadership of the organization to ensure long-term sustainability.

The main challenges observed was the to rapidly implement the support model, the long-term sustainability of the support, and the resources needed to satisfy those demands. The support evaluated in the current study was largely built on volunteer work and ad hoc adjustments in clinical routines to meet the needs of staff. To ensure increased flexibility and predictability there is a need for healthcare organisations to have access to empirically supported and feasible psychological support programs, as well as resources to run these. Additionally, it is recommended that healthcare organisations establish a professional network for psychologists and other mental health professionals working within the organisation to facilitate reallocation of resources to current needs.

The design and data of the current study limits the conclusions regarding managers and staff members experience of the support. Additional studies are needed to cover these

aspects, as well as evaluation on the specific effects of support. The current process evaluation of the support model with interviews from psychologists delivering the support, gives preliminary support of the utility and feasibility of the model.

6.5 GENERAL DISCUSSION AND POINTS OF PERSPECTIVES

6.5.1 Interventions in intensive care

Systematic reviews covering interventions in intensive care and evaluating occupational psychological health present no specific recommendation, policies, or guidelines regarding choice of interventions (Alkhawaldeh et al., 2020; van Mol et al., 2015). For example, van Mol et al. (2015), who studied preventive strategies found support for a variety of individual-directed interventions, and organisational-directed interventions. The review by Alkhawaldeh et al. (2020), focusing on stress management, found support for individual-directed interventions based on cognitive behaviour therapy and mindfulness. Instead, reviews call for more studies, with improved designs.

Study III in the thesis adds to the existing body of research with further preliminary evidence of reduction in occupational stress and improved mental health following an intervention based on communication skills training. The linear mixed model analysis showed significantly improved fit with random intercept model for occupational stress, and random slope model for mental health/depression. This supports observations of the importance of taking individual variance into account when we look at occupational psychological health in intensive care, and development of interventions to fit the need of staff. Possible adjustments of the BST could be to emphasize the individual variance in perceived stress, also of similarly identical situations, during education and supervision. Further adjustment to individual needs could also be achieved by giving a broad repertoire of behavioural skills to choose from during skills training. The five skills included in the present training might not reflect the needs of staff. Additionally, the BST could be structured to be delivered solely to participants that choose the intervention, and not given to the entire unit/work force. This would enable an evaluation of the intervention in a more individual-directed format. Although, this solution could miss out on possible benefits from including the entire work force at the unit.

Notably, WAAQ and UWES were included in the studies to show a possible alternative perspective on occupational psychological health than a narrow focus on distress. In study III, there was no change in levels of work engagement (UWES) or psychological flexibility (WAAQ). These results could be an indication that the intervention has no effect on these variables, and that the intervention primarily targets perceived stress and mental health. An alternative interpretation that should be considered in future studies are that levels of occupational psychological health in the sample are....

Additionally, the results of LMM analyses in study III showing effect on occupational stress and mental health to be dependent on years of work experience show that further analysis are needed. This could be an indication that the intervention are more effective experienced staff.

Finally, even though the intervention was targeting communication skills, there was no specific measure of communication skills to evaluate individual variation and change during intervention included in the study. Such a measure could have improved interpretation and conclusions regarding effect. The planning of the research project did include recordings of roleplays where participants were to take care of a patient's relative within intensive care. Questions regarding validity of participants' performance, as well as coding of recordings, unfortunately led to the exclusion of the use of them as a measure of communication skills. A development of such a measure could evidently improve development of communication skills training interventions.

6.5.2 Design of studies

Due to the nature of design, the results from intensive care are low-quality evidence. This holds for the present thesis as well, with the evaluation of the BST program (Study III), which had a simple design (pre-post, uncontrolled trial). Notably, this design appears common in evaluation of preventive interventions, directed to entire units. Randomization and control groups might prove difficult when studying complete units, i.e., randomize staff to different conditions. In some work settings, it might be feasible, but designation to work groups are commonly restricted by the nature of work despite aspirations of a more complex design. One option is to randomize on the level of unit, however that requires that several units that are prepared to undergo occupational health work interventions at the same time. A possible solution is the Controlled-Before-After trial, a quasi-experimental design with non-randomized control, which might be feasible if having access to large enough sample. A systematic review by Ruotsalainen et al., (2015) shows that effect sizes when studying preventive intervention directed at occupational stress among healthcare professionals are generally small, and small effects need large samples. Otherwise, there is a risk that effective interventions are discarded because of non-significant results effects due to low power. Ruotsalainen et al. (2015) suggests samples with at least 120 participants. A third possible design, mentioned by Ruotsalainen et al. (2015) in their Cochrane review of preventive strategies to healthcare, is Interrupted Time Series (ITS). These studies use repeated measurement before, during, and after intervention and evaluate whether patterns of data are different at post intervention compared to pre intervention. Although Ruotsalainen et al., (2015) considered ITS as eligible in their evaluation of organisational interventions, they found no such study to include. Additionally, a systematic review by Hudson et al., (2019) describe ITS as a viable alternative to RCT, but they report of poor quality when reporting those studies.

6.5.3 Cross-sectional and longitudinal design

A majority of studies reporting on the occupational psychological health of healthcare professionals are cross-sectional, as are several of the analyses used in this thesis. Results from comparisons between cross-sectional and longitudinal data show that results might not replicate. Thus, it is important to view results in cross-sectional studies as cross-sectional results, which should be further validated in other designs. Problems inherent in cross-sectional studies are partly a result of the changeable nature of some variables. In a longitudinal design, we could measure the individual variance. In cross-sectional data you assume there is no within-individual variance, which does not hold for most psychological variables. On the other hand, that longitudinal data is superior to cross-sectional data does

not mean that cross-sectional data is of no use. Cross-sectional data does, of course, add some information over no data. And cross-sectional data from a more complete sample could be an advantage over longitudinal data from a selected subsample.

6.5.4 Clinical implications

Possible clinical implications of the thesis and the included studies are related to the use of measures of psychological flexibility, and the use of the discussed interventions to address occupational health in intensive care.

Occupational psychological health could benefit from measuring other aspects of health than distress, and psychological flexibility has been shown to be a useful construct. Study I and II support the utility of WAAQ, the availability of a Swedish version of WAAQ makes that possible in Swedish settings, and this measure could supplement measurement of occupational psychological health.

Throughout the thesis, the scarcity of studies evaluating interventions in intensive care targeting the occupational health of staff has been evident. Despite the fact that research show studies reporting on the distress and need experienced by intensive care medical staff has been published in scientific journals for over 50 years. Study III gives preliminary support to a Behavioural Skills Training program that could be used to improve occupational stress and general mental health among intensive care medical staff.

Furthermore, the interventions described in study III and IV, requires resources in terms of psychologists, or other mental health professionals to run them. These resources should be established at hospitals, in-house, to ensure easy access and use of these interventions.

Finally, Study IV also show the importance of managerial support for interventions, and the importance of feasibility and acceptability of interventions among staff. These aspects of implementation should be considered when introducing and developing interventions.

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