

An Exploration of Peer Support and its Relationship with Employee Mental  
Wellbeing: A Qualitative Study on Commercial Aviation Pilots

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I declare that this thesis is my own work and has not been submitted for the award of a higher degree  
elsewhere.

## Acknowledgements

I have reached the first moment in life, where I am strongly inclined to use and justify the word 'proof' instead of 'evidence' to support a conclusion. This is in relation to the topic of this doctoral dissertation. I hereby state that I have the foremost and best example of how social support influences wellbeing. Through my own experience, I cannot imagine going through this extremely educative process of trying to achieve a doctoral degree successfully without the support from peers (on all levels of peerness), relatives and supervisors. After years on a roller coaster filled with a mixture of enjoyments, frustrations and confusions, I have reached the end of this ride with a great sense of gratitude and satisfaction. I thank all my participants for the data underlying this piece of work and all of you for the numerous hours of guidance and encouragement spent on me. I am sincerely grateful for the countless sessions of 'walk & talks' and 'sit & talks' that have enabled me to not only see but reach the end of this tunnel.

– I would *not* have been able to get where I am today without *all* of you –

*Thank you!*

## Abstract

This study has used theory and research on peer support underpinned by shared first-hand experiences (i.e., peerness) on mental health recovery and concepts on social support within an occupational context to inductively explore the following research question: how is occupational peer support (OPS) experienced by commercial aviation pilots (CAPs) in relation to work-related mental wellbeing? Peer support underpinned by peerness based on mental illness has shown to be a crucial form of social support with a unique ability to sustain or increase mental health. However, empirical evidence on peer support underpinned by occupational peerness (i.e., OPS) and its relationship with employee mental wellbeing is limited. To attain a holistic understanding of the meaning of OPS in occupational high-risk environments and CAPs' experience of OPS in relation to work-related mental wellbeing, Braun and Clarke's (2006) inductive thematic analysis has been used to analyse data collected through 26 semi-structured interviews with 6 female and 18 male CAPs (gender undisclosed by two participants). Findings reveal CAPs' experience of OPS as: 1) a specific and irreplaceable form of social support based on psychologically close working relationships derived through shared first-hand occupational experiences; and 2) a form of social support highly dependent on individual differences and work-related experiences to be perceived as adequate protection against profession- and employer-related factors affecting mental wellbeing negatively. Thus, to protect CAPs against work-related mental health issues, commercial operators (COs) within the commercial aviation industry (CAI) are encouraged to support or provide CAPs with individually adapted OPS initiatives designed to support CAPs with work-related factors prone to affect mental wellbeing.

As such, this study provides theoretical and practical advice on OPS and its relationship with employee mental wellbeing and urges cooperation between practitioners and researchers striving to support a healthier and more prosperous workforce, regardless of cultural influences on work.

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## **List of Abbreviations**

**CAI** – commercial aviation industry

**CAP** – commercial aviation pilot

**CO** – commercial operator

**CPT** – captain

**F** – female

**FO** – first officer

**HRO** – high-reliability organisation

**ILR** – integrative literature review

**JDC** – job demand-control

**JDCS** – job demand-control-support

**M** – male

**OPS** – occupational peer support

**OPSN** – occupational peer support network

**SOP** – standard operating procedure

## Glossary of Terms

**Cabin crew** – One or more employees working with customers onboard an aircraft.

**Close call** – Near collision in-air or on-ground due to a crowded airspace.

**Cockpit crew** – One or more commercial aviation pilots operating an aircraft.

**Commercial aviation industry (CAI)** – The sector of aviation which “concerns the operation or use of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business, flown for purposes generally considered not for public hire and piloted by individuals having, at the minimum, a valid commercial pilot license with an instrument rating”.

**Commercial aviation pilot (CAP)** – Individual with a valid license to operate an aircraft within the commercial aviation industry (CAI).

**Commercial operators** – Professional organisations transporting passengers and goods by air for profitable purposes.

**Containment of unexpected events** – HRO-related safety principle referring to work-related attributes reflecting extensive use of backup systems, standard operating procedures (SOPs) and training. This includes everyday practices comprising of knowledge transfer and crosschecking to ensure a highly functional workflow and competent workforce. Also, to manage the unexpected, job roles and responsibilities are set within clearly defined structures that are assumed to be followed by employees.

**Crewmembers** – Cabin crew and cockpit crew.

**Crisis reaction** – When coping strategies are depleted and replaced with longstanding somatic and psychological issues.

**Critical incident** – Event prompting somatic and psychological reactions that are strong enough to overwhelm individual coping mechanisms.

**Duty** – A set of legs.

**Effective problem anticipation** – HRO-related safety principle assuming that all issues and failures (even trivial ones) are recorded and analysed to establish an accurate state of operation and an up-to-date record of procedures in place. As such, this HRO-related safety principle urges organisations operating in high-risk environments to engage with employees at all levels. This in turn is presumed to facilitate exploration of threats to safety, including identification and prevention of system failures that may have perilous outcomes.

**Epistemology** – Nature of knowledge.

**High-reliability organisation (HRO)** – Organisation adopting and adhering to safety-related principles to minimise the likelihood of critical incidents.

**High-risk environments** – Surroundings recognised by elevated risks of having minor mistakes develop into critical incidents causing crisis reactions.

**Just culture** – HRO-related safety principle referring to an open and ongoing dialogue on how procedures put in place connect with contemporary knowledge on safety. Organisations are recommended to accept actions taken by employees that are out of the ordinary but in line with or can be justified by agreed safety-related guidelines and to use these events as material for learning rather than reasons to judge and punish.

**Learning orientation** – HRO-related safety principle which encourages transparency and documentation of issues, and a work environment that allows collective learning from incident investigations. Training based on insight from past failures is delivered to support continuous learning. Attributes related to this principle are also recognised by open discussions and ongoing revisions of procedures based on contemporary safety-related knowledge.

**Leg** – The transportation of passengers from one destination to another.

**Line-check** – Performance reviews conducted in-air during flight.

**Mental wellbeing** – Defined in accordance with a multi-disciplinary review of wellbeing “as the balance point between an individual’s resource pool and the challenges faced”.

**Method** – Technique applied to collect and or analyse data within research.

**Methodology** – Framework within which research is conducted.

**Mindful leadership** – HRO-related safety principle that emphasises a genuine attempts to entrust, engage and communicate with employees to gain operational insights and knowledge on how to map and act upon individual needs. According to this principle, formal training programs should be available at all levels and assessments should be marketed as methods to uphold professionalism rather than being processes conducted to justify dismissal or create a sense of condemnation. Moreover, strategies put in place to protect safety ought to be respected and not jeopardised by profit-oriented strategies. Resources required to attain equipment that meets safety-related standards, for example, should not be cut or redirected to serve non-safety-related business needs.

**Occupational peer support (OPS)** – Peer support underpinned by peerness based on occupational experiences.

**Occupational peerness** – Peerness based on occupational experiences.

**Occupational peer** – Individual connected to another individual through occupational peerness.

**Ontology** – The nature of reality or being.

**Peer** – Individual connect to another individual through peerness.

**Peer support** – Social support exchanges between individuals underpinned by peerness.

**Peerness** – Shared first-hand lived experiences between peers.

**Pilot pushing** – Negative impact of commercial pressures on CAP decision-making, reflecting flawed decisions such as agreeing to operate in dangerous weather conditions, accepting technical issues and allowing perilous fuel limitations.

**Rest period** – Longer break used to part consecutive duties.

**Second victim** – The psychological impact of consciously or unconsciously committing or contributing to critical incidents.

**Sit time** – A break after eight hours within a leg.

**Standard operating procedures (SOPs)** – Within the commercial aviation industry (CAI), guidelines aimed to create a shared mental model of each task performed by crewmembers.

**Startle effect** – Spontaneous and uncontrollable reactions elicited by unexpected and intense events.

## Chapter 1: Introduction

### 1.1. Peer support, peerness and mental wellbeing

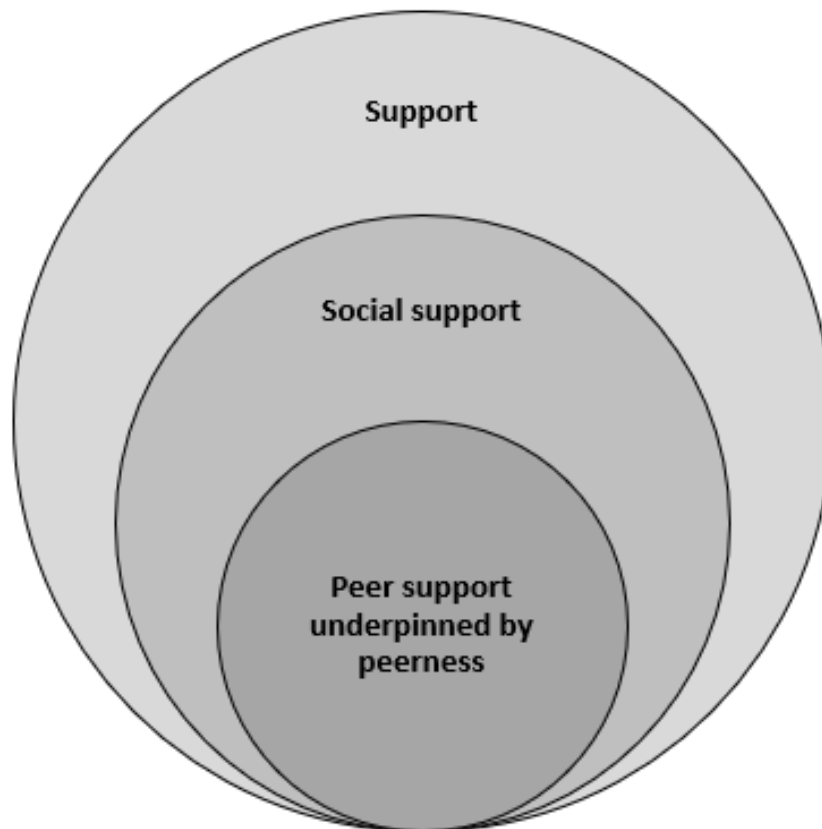
Recent research has explored and described peer support as social support exchanges underpinned by peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011), which has been defined as shared first-hand lived experiences (Gillard et al., 2014). Based on the above assumptions, informal peer support is a familiar form of social support as throughout history, individuals have been seeking support from other individuals based on mutual experiences (Beales & Wilson, 2015). Formal peer support initiatives, however, originate within research on mental health-related peerness on mental health. As a response to the limited effectiveness of traditional health services for individuals with substance abuse and addiction during the mid-1900s, the idea of being able to provide support based on peerness gained awareness (Gidugu et al., 2015; Simoni et al., 2011). Since its introduction within the field of mental health, numerous mental health-related peer support initiatives have shown to help individuals to recover from mental ill-health (e.g., Simpson et al., 2014; Walker & Bryant, 2013). Consequently, peer support started to get formalised through programs such as the Alcoholics Anonymous (Alcoholics Anonymous, 2021), and with its success proliferated into a wide range of health-related services targeting physical and mental illness (Beales & Wilson, 2015; Gidugu et al., 2015; Simoni et al., 2011). Today peer support underpinned by peerness is known as a specific form of social support within the field of mental health (see Figure 1) and has been described by Mead et al. (2001) as:

A system of giving and receiving help founded on key principles of respect, shared responsibility, and mutual agreement of what is helpful. Peer support

is not based on psychiatric models and diagnostic criteria. It is about understanding another's situation empathically through the shared experience of emotional and psychological pain. When people identify with others who they feel are 'like' them, they feel a connection. This connection, or affiliation, is a deep, holistic understanding based on mutual experience where people are able to 'be' with each other without the constraints of traditional (expert/patient) relationships. (Mead et al., 2001, p. 135)

**Figure 1**

*Visual demonstration of how peer support underpinned by peerness relate to support and social support*



A crisis reaction is known to occur when individuals experience longstanding somatic and psychological issues as a result of depleted coping strategies (Gunia et al., 2015; Mitchell & Leonhardt, 2010), whereas events prompting somatic and psychological responses that are strong enough to overwhelm coping mechanisms are recognised as critical incidents (Gunia et al., 2015; Mitchell & Leonhardt, 2010). Derived through the field of mental health, peer support within an occupational context has been seen in research on medical practitioners' experience of the second victim phenomenon (Calder-Sprackman et al., 2018; Dukhanin et al., 2018; Johnson et al., 2019; Merandi et al., 2017; Plews-Ogan et al., 2016). The psychological impact of critical incidents has traditionally been explored in relation to the mental health of patients or relatives of patients (Wu, 2000). Not until recently have the effects of medical practitioners' involvement in critical incidents been highlighted and explored, which has shown to have profound negative consequences on medical practitioners' mental health (Conway & Weingart, 2009; Coughlan et al., 2017; Edrees et al., 2011). Research has revealed how both first victims (i.e., patients) and second victims (i.e., medical practitioners) of critical incidents are at risk of experiencing crisis reactions (Coughlan et al., 2017; Edrees et al., 2011).

To protect employees against the second victim phenomenon (Calder-Sprackman et al., 2018; Dukhanin et al., 2018; Johnson et al., 2019; Merandi et al., 2017; Plews-Ogan et al., 2016), organisations operating in medical high-risk environments have started to explore peer support associated with occupational experiences (e.g., Hu et al., 2012; Pinto et al., 2013). In line with research on mental health-related peeriness on mental health (e.g., Simpson et al., 2014; Walker & Bryant, 2013), findings are now available that reveal a positive relationship between



occupational-related peer support and mental health recovery amongst second victims (Cieslak et al., 2014; Conway & Weingart, 2009; Edrees et al., 2011; Elwood et al., 2011; Galek et al., 2011; Sirriyeh et al., 2010; Tatano Beck, 2011). As a result, peer support underpinned by peerness based on shared first-hand occupational experiences seems to gain recognition within an organisational setting as a specific form of work-related social support (e.g., Bruce et al., 2005; Hechi et al., 2020; Johnson et al., 2019; Scott et al., 2009).

### **1.1.1. Peer support within the commercial aviation industry**

Airlines have been early with interventions designed to support pilots with performance and performance-related issues (Mitchell & Leonhardt, 2010). Crew resource management (CRM) training, for example, has been around since late 1970s and is designed to train pilots in decreasing the risk of aviation-related critical incidents caused by pilot and or crew error (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Creamer et al., 2012; Helmreich et al., 1999; Kanki et al., 2010; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981). In agreement with two safety principles referred to as *Just culture* and *Learning orientation* (Lekka, 2011), CRM training is used by airlines to encourage pilots to cooperate and streamline operations. CRM training also helps to keep an open and ongoing dialogue on how procedures put in place connect with contemporary knowledge on safety (Lekka, 2011).

Specifically, by identifying, gathering and exploring near collisions in-air or on-ground (also known as close calls) and critical incidents in conjunction with supervision and coaching (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014;

Creamer et al., 2012; Kanki et al., 2010; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981), CRM training promote a culture of transparency and collective learning based on insight from well-documented and formally conducted safety-related investigations (Helmreich et al., 1999; Kanki et al., 2010). For example, flight simulators can be used to emulate human and or technical failures that are known to have occurred and caused critical incidents in-air in a safe environment. These sessions are subsequently followed-up through supervision and coaching with fellow pilots to prompt discussion and learning on how to successfully cope with similar incidents in a non-fictional environment (Bor et al., 2016; Helmreich et al., 1999; Kanki et al., 2010). This includes sharing occupational experiences in how to anticipate and recognize behavioural deviances, adverse reactions, skill deficiencies and psychological concerns within oneself and other pilots (The National Archives and Records Administration and The United States Government Publishing Office, n.d.a). Moreover, CRM training tends to support *Just culture* (Lekka, 2011) by helping airlines to accept actions taken by pilots that are out of the ordinary but in line with or can be justified by agreed safety-related guidelines and to use these events as material for learning rather than reasons to judge and punish (Helmreich et al., 1999; Kanki et al., 2010). With research demonstrating a positive relationship between CRM training and performance, airlines have agreed to make peer-based CRM training mandatory for pilots operating larger aircrafts (Flin & Maran, 2015; Kanki et al., 2010).

Two other initiatives adopted by airlines are the critical incident stress management (CISM) (Mitchell & Leonhardt, 2010) and trauma risk management (TRiM) (Greenberg et al., 2010) programs, aimed at assisting pilots through crisis reactions as a result of directly or indirectly experiencing aviation-related critical

incidents or close calls (Bor et al., 2016; Creamer et al., 2012; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981). By teaching elements of psychological first aid training (World Health Organization, 2011), CISM and TRiM programs hope to connect pilots struggling with poor mental wellbeing due to work with pilots interested in and educated to provide structured low-level social and psychological support (Bor et al., 2016; Creamer et al., 2012; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981). In contrast to CRM focusing on decreasing the risk of critical incidents caused by human errors (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Creamer et al., 2012; Kanki et al., 2010; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981), the CISM and TRiM programs can be seen as programs developed to support pilots trying to cope with work-related factors affecting mental wellbeing (Bor et al., 2016; Creamer et al., 2012; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981). As such, these programs resemble the occupational-related peer support provided to second victims within medical high-risk environments aimed at helping employees to deal with work-related mental health issues (Cieslak et al., 2014; Conway & Weingart, 2009; Edrees et al., 2011; Elwood et al., 2011; Galek et al., 2011; Sirriyeh et al., 2010; Tatano Beck, 2011).

Despite airlines' success of implementing CRM (Kanki et al., 2010) to decrease the risk of critical incidents cause by CAP-related errors (Accident Investigation Board, 1996; Daschle, 1996) and use of programs such as CISM (Mitchell & Leonhardt, 2010) and TRiM (Greenberg et al., 2010) to support pilots with work-related factors affecting mental health (Bureau D'Enquêtes et D'Analyses, 2016; National Transportation Safety Board, 1999), there is limited research on peer support associated with occupational peerness and its relationship with CAP-related mental wellbeing. Until today empirical

research involving pilots has predominantly explored physical health (e.g., Runeson-Broberg et al., 2014), training and performance (e.g., Kanki et al., 2010), ergonomics and human-machine interaction (e.g., Baxter et al., 2007) and assessment within selection and talent management (e.g., Hoermann & Goerke, 2014). Empirical evaluations of peer support initiatives on CAP-related mental wellbeing should be of focal interest to airlines, as CRM has a potential to diminish but not eliminate the risk of critical incidents causing crisis reactions amongst pilots (Bor et al., 2016; Lekka, 2011; O'Neil & Kriz, 2013).

Two critical incidents highlighting the need to reconsider how work-related relations and experiences over time are explored and acted upon to determine pilots' fitness to fly are EgyptAir flight 990 in 1999 and Germanwing Flight 9525 in 2015, leading to a total of 367 casualties (Bureau d'Enquêtes et d'Analyses, 2016; National Transportation Safety Board, 1999). Despite a record of satisfactorily completed medical and training checks, the EgyptAir flight 990 investigation report reveals that "seconds after the captain left the cockpit [...] the relief first officer stated quietly, "I rely on God." (National Transportation Safety Board, 1999, p.4) and continues to describe what may be interpreted as a preplanned suicidal mission by acknowledging that "There were no sounds or events recorded by the flight recorders that would indicate that an airplane anomaly or other unusual circumstance preceded the relief first officer's statement, "I rely on God. [...] the autopilot was disconnected." (National Transportation Safety Board, 1999, p.4).

The pilot (i.e., relief first officer) continued to divert the aircraft and managed to repeat "I rely on God" (p.5) eleven times before the incident took place (National Transportation Safety Board, 1999). As a result, the National Transportation Safety

Board (1999) concluded “that the probable cause of the EgyptAir flight 990 accident is the airplane’s departure from normal cruise flight and subsequent impact with the Atlantic Ocean as a result of the relief first officer’s flight control inputs” (p.67). Although, being deemed medically fit to fly, “the reason for the relief first officer’s actions was not determined” (National Transportation Safety Board, 1999, p. 67).

The investigation report of Germanwing Flight 9525 describes a pilot that lures his pilot colleague out of the cockpit to get the opportunity to, and succeeded with, diverting a fully functional aircraft into the French Alps (Bureau d’Enquêtes et d’Analyses, 2016). Whereas the pilot of EgyptAir flight 990 had a clean record upon departure, authorities within the commercial aviation industry (CAI) had officially assessed and supported the Germanwing Flight 9525 pilot through episodes of mental instabilities prior to takeoff (Bureau d’Enquêtes et d’Analyses, 2016). Nonetheless, poor historical attention and the use of medical assessments that primarily explored aviators’ present state of mind (Federal Aviation Administration, 2020) resulted in a loophole, allowing the Germanwing Flight 9525 pilot to quietly navigate through procedures put in place by his current employer aimed at identifying fitness to fly (Bureau d’Enquêtes et d’Analyses, 2016).

It is therefore reasonable to suggest, when exploring the lack of investigation conducted on historical work-related relations and experiences leading up to the deadly maneuvers committed by the pilots, that the critical incidents of EgyptAir flight 990 and Germanwing Flight 9525 could have been prevented if the connection between and within CAI-related officials, airlines and pilots were stronger. Drawing upon findings on peer support and its potential to build relations that help individuals to discern and cope with mental wellbeing issues (e.g., Cieslak et al., 2014; Conway &

Weingart, 2009; Edrees et al., 2011; Elwood et al., 2011; Galek et al., 2011; Sirriyeh et al., 2010; Tatano Beck, 2011), access to trustworthy occupational peer support initiatives could have increased airlines' chance of detecting current and past work-related relations and or experiences leading to the abnormal and fatal actions taken by the first officers operating EgyptAir flight 990 and Germanwing Flight 9525.

Consequently, to protect the mental wellbeing of employees operating within the CAI and the public from critical incidents associated with CAP-related mental health, airlines should leverage on empirical research revealing a positive relationship between mental health-related peerness on mental health recovery (e.g., Beales et al., 2015; Forchuk et al., 2016; Puschner, 2018) and findings showing how initiatives drawing upon shared first-hand occupational experiences launched within the CAI can bring positive peer support receiver and provider reactions (Bor et al., 2016; Mitchell & Leonhardt, 2010; Mulder & de Rooy, 2018; Santilhano et al., 2019).

## **1.2. High-risk environments, high-reliability organisations and commercial operators**

Occupational high-risk environments can be identified by the elevated risks of having minor work-related mistakes develop into critical incidents causing crisis reactions (Gunia et al., 2015; Mitchell & Leonhardt, 2010) which, in turn, increases employees' sense of work- and safety-related responsibilities (Mitchell & Leonhardt, 2010). Moreover, critical incidents leading to casualties and or severely wounded are often globally noticed (Gunia et al., 2015; Mitchell & Leonhardt, 2010; O'Neil & Krane, 2012; Wiegmann et al., 2004). Negative publicity that impairs reputation can result in organisational issues, including economical complications or bankruptcy as a result of

redirecting capital resources towards employee-related treatments against crisis reactions and or extensive post-incident investigations (Gunia et al., 2015; Mitchell & Leonhardt, 2010; O'Neil & Krane, 2012; Wiegmann et al., 2004). As a result, when comparing wellbeing in organisations, employees operating in high-risk environments have significantly higher risks of experiencing mental health-related issues associated with work-related critical incidents and crisis reactions (Gunia et al., 2015; Offstein et al., 2014; Russell, 2014).

To prevent failures detrimental to employee mental wellbeing and business objectives organisations operating in high-risk environments have started to spend extensive resources on processes aimed at reducing work-related errors (La Porte & Consolini, 1998; O'Neil & Krane, 2012). In the mid-1980s, a group of researchers started to explore these processes, which resulted in a set of identifiable attributes that can be used to recognize organisations with reliable operations and an acceptable level of safety (La Porte & Consolini, 1998; O'Neil & Krane, 2012; Sutcliffe, 2011). According to a review of literature prepared by the Health and Safety Laboratory for the Health and Safety Executive (Lekka, 2011), these attributes can be listed under five principles: 1) *Containment of unexpected events*; 2) *Effective problem anticipation*; 3) *Learning orientation*; 4) *Just culture*; and 5) *Mindful leadership*.

Organisations adopting and adhering to Lekka's (2011) safety-related principles to attain an acceptable level of safety that decreases the risk of work-related critical incidents causing crisis reactions are commonly referred to as high-reliability organisations (HROs). As such, HROs are recognised by operating in high-risk environments where minor operational system failures caused by humans can but are unlikely to develop into costly outcomes that are intolerable and feared by employees,

customers and the general public (La Porte & Consolini, 1998; Lekka, 2011). Some of the most prominent HROs are found within the CAI, also known as business aviation and defined as:

That sector of aviation which concerns the operation or use of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business, flown for purposes generally considered not for public hire and piloted by individuals having, at the minimum, a valid commercial pilot license with an instrument rating. (Ingleton, 2008, p. 33).

Specifically, by adhering to safety-related rules and regulations airlines (from here on referred to as commercial operators, COs) have been able to work with formally licensed pilots (from here on referred to as commercial aviation pilots, CAPs) to maintain a low number of aircraft-related critical incidents. This is apparent when the number of fatal accidents is compared against flight hours and departures as well as fatalities recorded within similar industries operating in high-risk environments (see Table 1) (O'Neil & Kriz, 2013). As a result, the general public currently perceives COs as safe organisations comprising of CAPs with reliable safety records (Chassin & Loeb, 2013; Ingleton, 2008; Lekka, 2011; Mitchell & Leonhardt, 2010; O'Neil & Kriz, 2013). Nonetheless, COs' mission to be recognised as HROs has resulted in a very unique work environment whereby CAPs are required to cope with novel challenges affecting mental wellbeing (e.g., Bor et al., 2016; Kanki et al., 2010; Lekka, 2011).



**Table 1**

*Statistics on fatalities within the commercial aviation industry and similar industries operating in high-risk environments*

Operation and fatalities within the CAI (2011) <sup>a</sup>				
Flight hours	Passenger miles	Departures	Fatal accidents	
> 17.2 million	7.5 billion	~ 9 million	0	
Number of fatalities in high-risk environments (2009)				
The CAI <sup>a</sup>	Highway	Railway	Maritime	Pipeline
50	33 808	751	817	14

<sup>a</sup> Recorded in the United States of America and neighbouring international waters

### **1.2.1. Commercial aviation pilots: Work issues associated with mental wellbeing**

Whilst COs strive to decrease the likelihood of critical incidents, the introduction and dedication to upholding stringent HRO-related safety principles have resulted in substantial changes to the work environment (DeHoff & Cusick, 2018; Federal Aviation Administration, 2018, 2020; Moriarty, 2015; The European Union Aviation Safety Agency, 2019; The National Archives and Records Administration and The United States Government Publishing Office, n.d.e). Several of these changes can be associated with mental health-related work issues experienced by CAPs (Lekka, 2011). *Containment of unexpected events*, for example, entail attributes reflecting extensive use of backup systems, standard operating procedures (SOPs) and training. This includes everyday practices comprising of knowledge transfer and crosschecking to ensure a highly functional workflow and competent workforce. Also, to manage the unexpected, job roles and responsibilities are set within clearly defined structures that are assumed to be followed by employees (Lekka, 2011).

Within COs, *Containment of unexpected events* can be identified through the extensive use of aviation-related SOPs created to ensure that crewmembers have a shared mental model of how tasks involved in operating an aircraft shall be executed and by whom (Bor et al., 2016; Federal Aviation Administration, 2017). In-air operation is commonly divided into two teams; the cockpit crew comprising of one or more CAPs operating the aircraft, and the cabin crew working with customers onboard the aircraft (Essence Learning, 2012). At the top of the hierarchy, CAPs are designated to take the lead and are accountable for final decisions and consequences. This includes safety-related actions and outcomes affecting the wellbeing of all onboard, including passengers (Bor & Hubbard, 2006). When the CAP in command is judged to be unfit to operate, his or her responsibilities are shifted to the co-worker predetermined to be next in command (usually a CAP). As such, hierarchically distributed job roles are used within the CAI to ensure transparency in terms of one's own and others' autonomy and responsibilities during operation (Bor et al., 2016; Bor & Hubbard, 2006).

Whereas SOPs have shown to help CAPs to manage unexpected events during in-air operations (Federal Aviation Administration, 2017), a very procedural work environment can have negative effects on mental wellbeing (e.g., Mjøs, 2004; Moriarty, 2015; National Transportation Safety Board, 1990, 1997). For example, too defined SOPs can decrease opportunities for personal development associated with creativity (Sparks et al., 2001; Tesluk et al., 1999). Moreover, rigorous SOPs can hurt CAPs' ability to handle events out of the ordinary that requires a certain level of swiftness to be cleared successfully (e.g., medical emergencies, violent passengers, bomb threats, hijacking and hostage-takings) (Mjøs, 2004; Moriarty, 2015). Contrary to predictions, aircraft-related critical incident investigations have shown that safety

principles such as the use of SOPs can be connected with poor decision-making during pressurised situations (Bor et al., 2016; Mitchell & Leonhardt, 2010). The *Startle effect*, for example, is recognised by spontaneous and uncontrollable reactions elicited by unexpected and intense events during operation in a very procedural environment (Moriarty, 2015).

Similarly, there are numerous examples of how defined job roles have contributed to critical incidents (e.g., National Transportation Safety Board, 1990, 1997). One such example is the Korean Air Flight 801 in 1997 which caused 228 fatalities. Taking place within a high-power distance culture, lower-ranked crewmembers were oppressed to remain silent when doubting orders provided by a senior CAP in command. This resulted in hesitation and the inability to prevent foreseen issues (National Transportation Safety Board, 1997). Avianca Flight 52 in 1990 with 73 fatalities is another critical incident associated with repressed communication due to strictly defined job roles and responsibilities. In this situation the CAP in command expected orders to be followed without hesitation or questions, which hampered crewmembers' capacity to participate in decision-making processes and act when confronted with technical issues (National Transportation Safety Board, 1990). Multiple investigations exploring aircraft-related critical incidents suggest that fatal human errors have been prompted by cultural habits affecting CAPs' ability to communicate, make decisions and take the lead in times of uncertainty (Civil Aviation Authority, 2015; Bor et al., 2002; de Brito Neto, 2014; Foushee, 1984; Helmreich & Merritt, 1998; Milanovich et al., 1998). This shows how clearly defined job roles associated with *Containment of unexpected events* (Lekka, 2011) can hurt CAPs'

capability to work safely when combined with cultural practices such as sensing a strong obligation to respect hierarchal formations (Kanki et al., 2010).

*Effective problem anticipation* assumes that all issues and failures (even trivial ones) are recorded and analysed to establish an accurate state of operation and an up-to-date record of procedures in place (Lekka, 2011). As such, this HRO-related safety principle urges organisations operating in high-risk environments to engage with employees at all levels. This in turn is presumed to facilitate exploration of threats to safety, including identification and prevention of system failures that may have perilous outcomes (Lekka, 2011). Findings suggest, however, that *Effective problem anticipation* is another HRO-related safety principle that can be associated with work factors affecting CAPs' sense of mental wellbeing (e.g., Lempereur & Lauri, 2006; Tani, 2010). Regulations within the CAI state that CAPs need to be medically fit-to-operate (Federal Aviation Administration, 2020; Bor et al., 2002; Foushee, 1984; Vuorio et al., 2014), which is ensured by subjecting CAPs to randomly conducted alcohol and drug tests and rigorous physical and psychological health checks every sixth month (Federal Aviation Administration, 2020; Bor et al., 2002; Foushee, 1984; Vuorio et al., 2014). Additionally, to be formally licensed CAPs must attain an instrument rating for the aircraft type they are employed to operate (Ingleton, 2008) and maintain its validity. This includes excessive training to pass regular and comprehensive skills assessments in-air (also known as line-checks) and on-ground in flight simulators as often as twice yearly (The National Archives and Records Administration and The United States Government Publishing Office, n.d.e).

The need to endure and pass regular assessments to stay legally fit to operate (Federal Aviation Administration, 2018, 2020; DeHoff & Cusick, 2018; The European

Union Aviation Safety Agency, 2019) has induced a sense of resentment amongst CAPs, as failing an assessment can result in long-term suspension or early retirement (Bor et al., 2002, 2016; DeHoff & Cusick, 2018; Vuorio et al., 2012). Moreover, preconceptions of CAPs as 'immune' to wellbeing issues generally accepted as a part of being human and safety principles urging an open dialogue on work-related threats to operation (Lempereur & Lauri, 2006; Tani, 2010; Santilhano et al., 2019; Wu et al., 2016) have led to issues in recognising or accepting factors that can have a negative effect on mental wellbeing (Santilhano et al., 2019; Wu et al., 2016). In worst-case, CAPs are capable of staying quiet and self-treat mental health issues to protect themselves against reprimands prompted by stringent health-related expectations. Examples of critical incidents deemed to be associated with undetected and or consciously hidden mental health-related issues are EgyptAir Flight 990 in 1999 and Germanwings Flight 9525 in 2015, resulting in a total of 367 fatalities (Bureau D'Enquêtes et D'Analyses, 2016; National Transportation Safety Board, 1999).

The HRO-related safety principle *Mindful leadership* emphasises genuine attempts to entrust, engage and communicate with employees to gain operational insights and knowledge on how to map and act upon individual needs. Thus, formal training programs should be available at all levels and assessments should be marketed as methods to uphold professionalism rather than being processes conducted to justify dismissal or create a sense of condemnation. Moreover, strategies put in place to protect safety ought to be respected and not jeopardised by profit-oriented strategies. Resources required to attain equipment that meets safety-related standards, for example, should not be cut or redirected to serve non-safety-related business needs (Lekka, 2011).

Elements of *Mindful leadership* can be seen within CAI-related policies created to protect CAPs from work-related errors prompted by fatigue (Bor & Hubbard, 2006; Goffeng et al., 2019; Holmes et al., 2012; Petrie & Dawson, 1997; Yen et al., 2009). With technically advanced aircrafts it is possible to transport passengers between destinations separated by vast distances (Federal Aviation Administration, 2003). This has resulted in rosters that incorporate shifts to transport passengers or cargo from one destination to another that can: 1) start and end at irregular timings; 2) begin and end at destinations separated by multiple time zones; and 3) last for numerous flight hours (van Veen-Groot & Nijkamp, 1999). To avoid fatigue-related safety issues policies have been put in place on a federal level that enforces COs to provide and adhere to rest restrictions (Schaefer et al., 2001; The National Archives and Records Administration and The United States Government Publishing Office, n.d.c, n.d.d), which gives CAPs a sit time (i.e., break) after eight hours within a leg (i.e., shift) and within a longer duty (i.e., a set of legs) (Schaefer et al., 2001; The National Archives and Records Administration and The United States Government Publishing Office, n.d.c, n.d.d). In addition, COs must ensure that consecutive duties are separated by proper rest periods (Schaefer et al., 2001).

To meet commercial pressures *and* rest restrictions COs are commonly providing CAPs with a monthly roster that is individually created. When barriers of physical distance and rest periods are pushed to their limits, these rosters can include a combination of duties and sit times that result in a 'day away from home' lasting from a few hours to multiple days. (Bor et al., 2016; Bor & Hubbard, 2006; Goffeng et al., 2019; Holmes et al., 2012; Kennedy & Kay, 2013; Schaefer et al., 2001; The National Archives and Records Administration and The United States Government Publishing

Office, n.d.b, n.d.c, n.d.d; Petrie & Dawson, 1997; Yen et al., 2009). The time away from home can increase significantly with unexpected delays, cancellations and or diversions (Bor et al., 2016; Kennedy & Kay, 2013; Schaefer et al., 2001). Long duties, including multiple rest periods at diverse and unfamiliar destinations and legs starting and ending at irregular timings and time zones, have been related to mental and physical work-related issues such as jetlag, fatigue and social isolation (Bor et al., 2016; Kennedy & Kay, 2013; Schaefer et al., 2011). Being away from family and friends for several days regularly has also shown to damage non-work-related social relationships vital for mental wellbeing (Haar et al., 2019; Lederer et al., 2018; White et al., 2003). Moreover, unique rosters often result in CAPs working with team members for no longer than a single duty, which impacts CAPs' ability to build strong, entrusting and long-lasting social ties with co-workers. Specifically, findings have shown a decline in mental wellbeing when CAPs are required to regularly establish and end work relations within short timeframes, as this decreases time to connect with co-workers on a deeper level and the opportunity to create sustainable work-related relationships (Bor & Hubbard, 2006; Shin et al., 2016; Wijewardena et al., 2017). Irregular team compositions have shown to decrease CAPs' opportunity to entrust co-workers with concerns or for co-workers to detect and support subtle or repressed health concerns in time (Federal Aviation Administration, 2020; DeHoff & Cusick, 2018; Lassman et al., 2015; Rasmussen et al., 2020; Segrin & Passalacqua, 2010; The European Union Aviation Safety Agency, 2019).

Airspace has become an extremely crowded environment. In 2011, almost nine million departures were recorded in the United States of America and neighbouring international waters alone (O'Neil & Kriz, 2013). The growing number of aircrafts on-

ground and in-air has increased the risk of commercial pressures impacting the physical and mental wellbeing of CAPs. In addition to having to operate in a business-oriented environment (Ion, 2011; Lofquist, 2010; Shuk-Ching Poon & Waring, 2010), CAPs have to be mentally prepared to cope with being involved in a close call on a daily basis (Ion, 2011; Mitchell & Leonhardt, 2010). Moreover, critical incidents connected with commercial pressures have led to *Pilot pushing*, a term used to describe how profit-oriented strategies can push CAPs to stretch or overlook safety-related policies adhered to during non-pressurised situations (Accident Investigation Board, 1996; Daschle, 1996; Fanjoy et al., 2010; National Transportation Safety Board, 1971). For example, by following stringent fuel restrictions created by management to streamline operations, the CAPs of ALM Antillean Airlines Flight 980 were unable to manage difficult weather conditions causing airport congestion. The extended in-air hold-time caused fuel depletion and ultimately the lives of 23 individuals (National Transportation Safety Board, 1971). Another example is the critical incident of Aeroperú Flight 603 in 1996 that caused over 70 fatalities. Pressured to arrive on time, the CAPs forgot to examine and uncover the static ports vital for in-air flight data. Post-incident investigations revealed how rushing through on-ground checks before take-off can contribute to fatal decisions in-air, especially when CAPs lack training in operation under pressure (e.g., instrument reading when experiencing technical failures) (Accident Investigation Board, 1996; Daschle, 1996). Within the CAI there is a history of critical incidents suggesting that commercial pressures can push pilots to make decisions or behave in a way that contradicts the HRO-related safety principles, such as allowing perilous fuel limitations, agreeing to operate in dangerous weather conditions and missing or accepting technical issues (Fanjoy et al., 2010). As such, it is



reasonable to suggest that commercial pressures have started to challenge COs' capacity to provide CAPs with support that encourages *Mindful leadership* (Lekka, 2011) and to uphold other HRO-related safety principles that have been agreed upon to protect employees, customers and the public from aviation-related critical incidents (Hummels, 1997; Marais & Robichaud, 2012; Schaefer et al., 2001; The National Archives and Records Administration and The United States Government Publishing Office, n.d.c, n.d.d).

In sum, it might be time to update and remind COs of the Air Commerce Act introduced in 1926, the first safety-related regulatory system created and initiated on a federal level to move the CAI from being notoriously known as unsafe to encompass some of the most prominent HROs of today (O'Neil, 2011). Whilst there are continuous attempts to ensure safety that is in line with the HRO-related safety principles proposed by the Health and Safety Laboratory for the Health and Safety Executive (Lekka, 2011), critical incidents still occur and in 75% to 80% of aircraft-related incidents recorded the cause has been associated with human shortfalls (Dumitru & Boşcoianu, 2015). Consequently, policies adopted by COs are likely to target certain types of safety threats but could equally be seen as principles contributing to other work-related factors that negatively affect CAPs' mental wellbeing (e.g., Accident Investigation Board, 1996; Bureau D'Enquêtes et D'Analyses, 2016; Daschle, 1996; National Transportation Safety Board, 1971, 1990, 1997, 1999). Specifically, whilst having to cope with; 1) commercial pressures (Bor & Hubbard, 2006; Goffeng et al., 2019; Holmes et al., 2012; Kanki et al., 2010; Mjøs, 2004; Moriarty, 2015; Petrie & Dawson, 1997; Yen et al., 2009); 2) hours in a constrained environment at an altitude of approximately 35 000 feet (Bor et al., 2016); 3) the risk of experiencing incidents or

close calls (Bor et al., 2016; Gunia et al., 2015; Mitchell & Leonhardt, 2010); 4) work in an ever-changing team and technical environment; and 5) harsh expectations set by stringent critics such as co-workers, customers and the general public (Bor et al., 2002, 2016; Bor & Hubbard, 2006), CAPs are forced to accept a work environment that requires on-going and in-depth physical and medical assessments (Federal Aviation Administration, 2020; Bor et al., 2002; Foushee, 1984; The National Archives and Records Administration and The United States Government Publishing Office, n.d.e; Vuorio et al., 2014), clearly defined job roles and SOPs (Kanki et al., 2010; Mjøs, 2004; Moriarty, 2015; National Transportation Safety Board, 1990, 1997) and irregular working hours (Schaefer et al., 2001; The National Archives and Records Administration and The United States Government Publishing Office, n.d.c, n.d.d) in order to protect COs' status as HROs (Lekka, 2011). To assist CAPs in coping with work factors prone to affect mental wellbeing, COs have started to explore peer support underpinned by peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) based on occupational experiences, which has been associated with employee mental wellbeing within medical high-risk environments (Adams et al., 2015; Anderson et al., 2020; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013).

To gain a better understanding of peer support in occupational high-risk environments, a literature review has been conducted with the aim to analyse empirical findings on peer support in occupational high-risk environments and its relationship with employee wellbeing. Based on review results, demonstrating a poor understanding of peer support underpinned by peerness (Daniels et al., 2017; Gillard

et al., 2014; King & Simmons, 2018; Simoni et al., 2011) and a limited number of empirical studies conducted on CAPs' experience of peer support in relation to work-related mental wellbeing, this study has aimed to explore peer support underpinned by peerness based on occupational experiences (i.e., OPS) in relation to employee mental wellbeing. With this aim, an attempt has been made to explore: 1) the meaning of OPS in occupational high-risk environments; and 2) CAPs' shared first-hand occupational experiences (i.e., occupational peerness) in relation to work-related mental wellbeing. To achieve aim and objectives, this study has explored the following research question: how is OPS experienced by CAPs in relation to work-related mental wellbeing?

A subjectivistic approach to social science has been adopted to answer the research question, as this methodological approach views the nature of being and how we come to know about reality as being derived from individuals' subjective meanings and understanding of their experiences through the world they live and work (Braun & Clarke, 2013; Burrell & Morgan, 1979; Creswell, 2008). In line with this ontological and epistemological worldview, in-depth data has been collected through semi-structured interviews and thematically analysed to generate findings that are rich enough to provide a holistic view of how OPS is experienced by CAPs in relation to work-related mental wellbeing (Braun & Clarke, 2013; Creswell, 2008). Study findings are believed to support further research on work-related social support and employee mental wellbeing and COs with an empirical understanding of how strategies can be applied within the CAI to increase CAPs' access to benefits associated with OPS. Findings are also believed to support organisations operating in occupational high-risk environments that are struggling with employee mental wellbeing or employers

sharing similar concerns with employees in settings that are reflective of CAPs' work environment.

## **Chapter 2: Literature review**

### **2.1. Background**

Scientists have been aware of the influence of social embeddedness on survival since research on evolution commenced mid to late 1800s (Sarason & Sarason, 2009; Williams et al., 2004). This has resulted in an overwhelming interest in trying to pinpoint the underlying functions of human relations (Sarason & Sarason, 2009) and as early as 1981, Barrera et al. (1981) recognised the importance of social support and its relationship with wellbeing. Presently, based on numerous empirical studies, it is generally accepted that social support is associated with morbidity, mortality, and an ability to resist stressors and to recover from illnesses (Sarason & Sarason, 2009).

As research on social support has progressed, so has its meaning (Gottlieb & Bergen, 2010). Through the development of a measurement scale in 1981, social support has been labelled as a range of support-related actions provided by family members, friends, neighbours and acquaintances (Barrera et al., 1981). Nearly twenty years later, social support has been re-defined to include "social resources that persons perceive to be available or that are actually provided to them by nonprofessionals in the context of both formal support groups and informal helping relationships" (Gottlieb & Bergen, 2010, p. 512). Defining and re-defining the concept of social support has led to difficulties in agreeing and committing to a mutually agreed picture of social support. This, in turn, has resulted in a theoretically complex view of social support, which has hampered the dissemination of reliable and transferable

research findings on social support and its relationship with wellbeing (Knox Haly, 2009; Sarason & Sarason, 2009; Siedlecki et al., 2014; Williams et al., 2004).

The matching hypothesis, for instance, suggests that the influence of social support on wellbeing is moderated by its congruence with issues experienced (Cohen & Wills, 1985). Other theories suggest that there are structural and functional aspects of social support that affect the relationship between social support and wellbeing. That is, the number and structure of direct and indirect social connections surrounding an individual (structural aspects) and types of resources that run through these social connections (functional aspects) are predicted to influence wellbeing to different degrees (Gottlieb & Bergen, 2010; Uchino, 2004).

As the social support aspects proposed in theory often are intertwined and or situational in everyday life (Cutrona & Russell, 1990; Uchino, 2004), research aiming to disseminate a reliable understanding of social support and its relationship with wellbeing have to be transparent in terms of setting, social networks and or types of social support explored (Cutrona & Russell, 1990; Uchino, 2004). Contemporary research revealing different aspects of social support should also be recognised within future research, such as empirical evidence demonstrating peer support underpinned by peerness and its ability to support mental health recovery (Beales & Wilson, 2015; Daniels et al., 2017; Gidugu et al., 2015; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011). Similarly, studies showing how social support can be perceived as intrusive and add to already existing experiences of stress when imposed (e.g., Burke & Goren, 2014) highlights a need to consider potential differences in sought versus imposed social support on wellbeing.

With theory and research identifying peer support as a specific form of social support influencing mental health recovery through support exchanges underpinned by shared first-hand lived experiences (i.e., peerness) (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011), peer support initiatives have been implemented within the CAI to reduce the risk of aviation-related critical incidents associated with CAP-related mental health issues (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Kanki et al., 2010; Mitchell & Leonhardt, 2010). Specifically, awareness of work issues prompted by aircraft-related operation and stringent HRO-related safety principles (e.g., Bor et al., 2002, 2016; Bor & Hubbard, 2006; Lekka, 2011) have resulted in several peer support-related initiatives being designed and delivered to CAPs (e.g., Bor et al., 2016; Mitchell & Leonhardt, 2010; Santilhano et al., 2019). Although, whilst these initiatives have been embraced as important social support networks to protect CAPs against mental health-related deterioration, empirical knowledge on the influence of OPS on employee mental wellbeing is weak and needs to be fortified (Bor et al., 2016).

To increase contemporary knowledge on how peer support initiatives can be used to support CAP-related mental wellbeing, a literature review has been conducted with the aim to analyse empirical findings on peer support in occupational high-risk environments and its relationship with employee wellbeing. With this aim, this review has three objectives: to analyse 1) the relationship between peer support in occupational high-risk environments and employee wellbeing; 2) how peer support in occupational high-risk environments has been explored; and 3) type of occupational high-risk environments wherein peer support has been explored. To achieve review aim and objectives, the following review question has been explored; what research

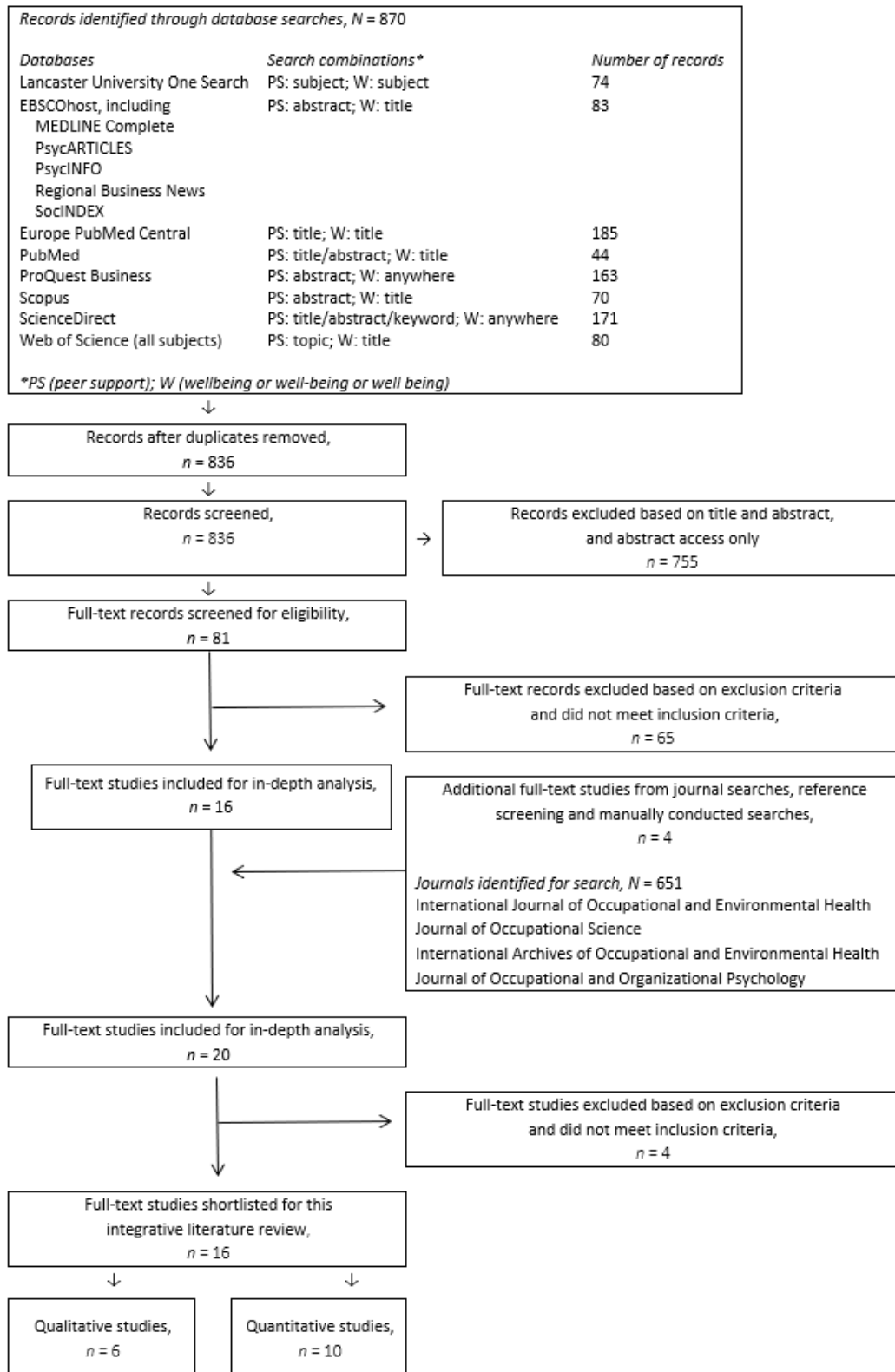
has been conducted on peer support in occupational high-risk environments in relation to employee wellbeing? Thus, the term peer support is used within this chapter in reference to peer support in occupational high-risk environments only.

## **2.2. Method**

An integrative literature review (ILR) has been conducted as this methodical approach allows the inclusion and synthesising of a wide range of empirically conducted research (Whittemore & Knafl, 2005), which is deemed necessary to answer the review question. As such, a computer-assisted systematic three-step search with no date limitation and an inclusion and exclusion criteria to screen records was conducted in September 2019 (with updates May 2020 and December 2020) to identify the maximum number of empirical studies conducted that are eligible for review up until November 2020. All searches and screening of records identified have been conducted by the researcher only. Findings have been presented through a PRISMA-diagram depicting the search strategy and records identified, screened and shortlisted for final review (see Figure 2) (Panic et al., 2013).

**Figure 2**

*PRISMA-diagram depicting search strategy and records identified, screened and shortlisted for final review*





In step one, eight databases (Lancaster University One Search, EBSCOhost, Europe PubMed Central, PubMed, ProQuest Business, Scopus, ScienceDirect and Web of Science) were searched for inductive, deductive and mixed-method studies using a combination of two search terms; *peer support* and *wellbeing* (with cultural influences on spelling taken into consideration). When possible, search terms were entered in one single search using the Boolean style. Multiple searches with various combinations of search terms were conducted in databases with restricted search options. Search fields (e.g., subject, abstract or title) were used to manage the relevance of records identified. This resulted in 836 records being identified for title and abstract screen when duplicates had been removed.

Only full-text records accessible in English and Swedish were shortlisted. Moreover, the title and or abstract had to include search terms (or thesaurus, synonyms or near-synonyms of search terms) and describe or refer to occupational high-risk environments. Previous research identifying occupational high-risk environments (e.g., Gunia et al., 2015; Lekka, 2011; Offstein et al., 2014; Russell, 2014; Sutcliffe, 2011) and a PICO framework (exploring *Population, Issue, Context* and *Outcome*) (Richardson, 1998) were used to identify databases for searches and to standardise setting and themes attuned to during title and abstract screening (see Table 2 for PICO-table). Records with titles and or abstracts indicating pertinence for this review were shortlisted by default, which resulted in 81 records being eligible for full-text screening.

**Table 2**

*PICO-table with search terms and themes attuned to during title and abstract screening*

PICO-terms	Population	Issue	Context	Outcome
Primary search terms		peer support		wellbeing
Search terms with cultural influences on spelling				<i>well-being</i> <i>well being</i>
Thesaurus, synonyms and near-synonyms of search terms attended to during title and abstract screening	- HRO - occupational high-risk environment - employees - staff - personnel - workers - workforce	- peer - co-worker - colleague - social support - collegial support - support	- work - organisation - occupational - workplace	- health - ill-health - physical - mental - burnout - stress - stressor - strain

Shortlisted full-text records were screened for eligibility using an inclusion criteria (Whittemore & Knafl, 2005) encompassing all of the following conditions: 1) empirically conducted study; 2) published in a peer-reviewed journal; 3) written in English or Swedish; 4) including the term *peer*; 5) exploring peer support and its relationship with mental and or physical employee wellbeing or mental and or physical employee wellbeing associated with work issues; 6) concerning employees operating professionally in a high-risk environment. For the purpose of this review, individuals employed within private or public industries that are exposed to elevated risks of physical and psychological strain due to greater levels of responsibilities and the likelihood of experiencing critical incidents caused by substandard performances were

perceived as employees operating in a high-risk environment. As such, Mitchell and Leonhardt (2010)'s definition of employees operating in high-risk environments have been used to identify empirical studies eligible for review, such as research conducted on CAPs (Santilhana et al., 2019), police officers (Dowling et al., 2006; Ryu et al., 2020) and intensive care personnel (Hu et al., 2012; Pinto et al., 2013).

Using the inclusion criteria, records were excluded when: 1) referring to empirically conducted studies (e.g., non-systematically conducted reviews published in textbooks for educational purposes); 2) being a peer-reviewed publication published in a non-peer-reviewed journal (e.g., PhD dissertations); 3) being an unpublished peer-reviewed publication; or 4) identified as an article in non-empirical magazines or a record on non-professional blogs or homepages. Similarly, records have been excluded if peerness has been primarily non-occupational (e.g., mental and or physical illness, such as cancer, PTSD) or a demographic variable (e.g., age, gender) and peer support has been explored through variables that can be indirectly associated with change(s) or influence(s) in mental and or physical wellbeing (e.g., performance). Empirically conducted studies on peer support have also been excluded if peer support has been exchanged between; 1) employed or non-employed students or trainees; 2) employees deemed to operate in a non-high-risk environment; or 3) employees with a range of different high-risk occupations. This resulted in, for example, the exclusion of studies exploring the wellbeing of general medical practitioners (e.g., Johnson et al., 2019). Altogether, 16 full-text studies were deemed pertinent for this review and therefore shortlisted for in-depth analysis (see Table 3 for inclusion and exclusion criteria applied).

**Table 3**

*Inclusion and exclusion criteria applied for full-text records identified post title and abstract screening*

Inclusion	Exclusion
<i>Type of record</i>	
+ Empirically conducted study (qualitative, quantitative or mixed-methods)	- Reference to an empirically conducted study (e.g., non-systematically conducted reviews published in textbooks for educational purposes)
+ Published in a peer-reviewed journal	- Peer-reviewed publication published in a non-peer-reviewed journal (e.g., PhD dissertation)
+ Written in English or Swedish	- Unpublished peer-reviewed publication
	- Grey literature (e.g., article in magazine, record on blog or homepage)
<i>Record content and context</i>	
+ Includes the term <i>peer</i>	- Peerness is primarily non-occupational (e.g., mental and or physical illness, such as cancer, PTSD)
+ Exploring peer support and its relationship with mental and or physical employee wellbeing or mental and or physical employee wellbeing associated with work issues	- Peerness is primarily a demographic variable (e.g., age, gender)
+ Peer support explored amongst employees operating professionally in a high-risk environment	- Peer support is explored through variables that indirectly can be associated with change(s) or influence(s) in mental and or physical wellbeing (e.g., performance)
	- Peer support is exchanged between employed or non-employed students or trainees
	- Peer support is exchanged between employees operating within a non-high-risk occupation
	- Peer support is exchanged between employees with a range of different high-risk occupations
<i>Example of record included</i>	<i>Example of record excluded</i>
> Police officers receive support from other police officers, which influences perceived work-related strain (Dowling et al., 2006)	> Medical physicists' view of social support provided from other medical physicists within radiation oncology (Johnson et al., 2019)
<i>Uncertainty during title, abstract and full-text screening</i>	
+ Records with content and or context being too vague to exclude based on preliminary screening or the inclusion and exclusion criteria were deemed pertinent and therefore shortlisted to be a part of this ILR	

In step two, four online journals (International Journal of Occupational and Environmental Health, Journal of Occupational Science, International Archives of Occupational and Environmental Health, and Journal of Occupational and Organizational Psychology) were identified based on previous research identifying occupational high-risk environments (e.g., Gunia et al., 2015; Lekka, 2011; Offstein et al., 2014; Russell, 2014; Sutcliffe, 2011) and the PICO framework (Richardson, 1998). These were searched for qualitative, quantitative and mixed-method studies using the same approach as during database searches. In the third and final step, studies were purposively sampled through manually conducted searches. That is, titles of studies published by leading authors identified through database and journal searches or in association with occupational high-risk environments and peer support were scrutinized by hand (e.g., citation tracking). Reference lists of full-text records screened for eligibility ( $n = 81$ ) were also title-screened. Screening of titles and abstracts in step two and three followed the same approach as screening of titles and abstracts in step one. This resulted in additional four full-text studies being included for full-text in-depth analysis using the inclusion and exclusion criteria ( $n = 20$ ). As such, a minimum of 1521 titles were screened for eligibility whereof 16 full-text and empirically conducted studies (six qualitative and ten quantitative) were shortlisted for review (see Figure 2 for PRISMA-diagram depicting search strategy and records identified, screened and shortlisted).

The 16 full-text studies identified for review (from here on referred to as studies in chapter two) encompassed a wide range of methods applied to explore aim and objectives. Due to the assorted selection, studies were initially evaluated on methodological rigour (Buccheri & Sharifi, 2017; Whitemore & Knaf, 2005). Two

critical appraisal forms were used to support this process. A critical appraisal form developed for appraising case control studies (Critical Appraisal Skills Programme, 2021a) was selected to evaluate the ten survey-based studies assessing differences between individuals deductively, whereas an appraisal tool developed to evaluate qualitative studies (Critical Appraisal Skills Programme, 2021b) was applied to critically appraise studies conducted inductively ( $n = 6$ ). Using the critical appraisal forms, studies were evaluated on level of evidence based on study design and conduct. That is, criteria within critical appraisal forms (e.g., “were the cases recruited in an acceptable way?”) were assessed through three categories providing zero, one or two points each: *No* (zero points), *Can’t tell* (one point) and *Yes* (two points).

To pinpoint the level of empirical research on *peer support* conducted in *occupational high-risk environments* and its relation to *employee wellbeing*, an action deemed pertinent in order to raise the quality of the review (Whittemore & Knaf, 2005), points given per study (using the critical appraisal form) were added and subsequently altered based on measures of occupational peerness. This incorporated a negative score based on 1) information on participants’ occupation (i.e., occupational peerness) (zero points for *Homogeneous*, one point for *Can’t tell* and two points for *Non-homogeneous*), 2) peer support definition (zero points for *Full*, one point for *Clues on meaning provided*, and two points for *None*) and 3) degree of peer support explored (zero points for *General exploration*, zero points for *Formal program evaluation*, and one point for peer support being a *Part of findings* or *Part of conclusion* only). The negative score (reflecting measure of occupational peerness) was at last converted into a percentage coefficient (e.g., a total score of one equalling 10% was transformed into a coefficient of 0.9).

Percentages coefficients were used to calculate overall appraisal scores. For example, a study scoring 20 points through questions on the critical appraisal form and a 0.9 coefficient based on measure of occupational peeriness was given a final score of 18 (20 x 0.9). Final scores were subsequently translated into overall appraisal rating of *Low*, *Medium* or *High* (based on  $\leq 32\%$ , 33% to 66%, and  $67\% \leq$  of maximum possible points, respectively). As such, *High* represents an overall stronger quality rating in terms of methodological rigour and methodological decisions made that were deemed pertinent to the quality of this review based on review aim and objectives. The studies were uploaded and analysed in ATLAS.ti (ATLAS.ti GmbH, 2021) in line with Whitemore and Knafelz (2005)'s three-stage data analysis process involving data reduction, data display and data comparison. Specifically, based on review aim and objectives and theory on social support and peer support on work issues and wellbeing (Beales & Wilson, 2015; Cohen & Wills, 1985; Daniels et al., 2017; Gidugu et al., 2015; Gillard et al., 2014; Gottlieb & Bergen, 2010; King & Simmons, 2018; Mead et al., 2001; Simoni et al., 2011; Uchino, 2004), data found within method, result and discussion sections in studies were analysed. This resulted in data on methodology, setting (including place conducted, occupational field, sample characteristics and recruitment date) and a summary of aspects associated with peer support being extracted and iteratively sorted, coded, categorised and finally summarised into themes used to answer the review question, that is, what empirical research has been conducted on peer support in occupational high-risk environments in relation to employee wellbeing? As data extracts were conceptualized into themes, each study was reviewed to verify that the final level of abstraction was congruent with all studies included within this review.

### **2.3. Findings**

The literature search identified 81 full-text records that met preliminary title and abstract screening. Sixty-five studies were excluded when screened for eligibility using an inclusion and exclusion criteria. Sixteen studies were explored and have been presented in detail below in relation to review aim and objectives (see Table 4 for a summary of studies identified for review).



**Table 4***Summary of the 16 studies identified for review*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Adams et al. (2015); “To provide an empirical understanding of the lived experiences of emergency medical dispatchers and examine ways in which this telemedicine role may impact on mental health and well-being” (p.445)	Qualitative; semi- structured interviews with data analysed using interpretative phenomenological analysis (IPA)	Australia; Health and medicine  <i>n</i> = 16, emergency medical dispatchers (can’t tell)  Recruitment date unknown	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (connection/emotional comfort)</p> <p>Degree of peer support explored? Part of findings (5 in-text references to <i>peer</i>)</p> <p>Definition of peer support? Clues on meaning provided</p> <p>Reference to:</p> <ol style="list-style-type: none"> <li>1) form of peer support? Yes (informal)</li> <li>2) work-related relations to cope with work issues? Yes</li> <li>3) peer support inhibitors? Yes (work climate)</li> </ol> <p>CASP score = 13</p> <p>Measure of occupational peerness = 3</p> <p>Overall appraisal score and rating: <math>(13 \times 0.7)/18 = 51\%</math> (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field  Sample size, occupation (participants’ occupation rating)  Recruitment date	Summary of findings  Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour) Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed) Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)
Anderson et al. (2020); “To identify and describe existing preparation and support mechanisms for ambulance personnel enacting decisions to terminate resuscitation and manage patient death in the field” (p.1)	Qualitative; focus group study with data analysed using Braun and Clarke’s thematic analysis (TA)	New Zealand; Health and medicine  Five focus groups of three to five participants with ambulance personnel (non-homogeneous)  Between March and May 2018	Positive influence on wellbeing? Yes (connection/emotional comfort/knowledge exchange) Degree of peer support explored? General exploration (12 in-text references to <i>peer</i> ) Definition of peer support? Clues on meaning provided References to: 1) form of peer support? Yes (formal/informal) 2) work-related relations to cope with work issues? Yes 3) peer support inhibitors? Yes (work climate/experience)  CASP score = 16 Measure of occupational peerness = 3 Overall appraisal score and rating: $(16 \times 0.7)/18 = 62\%$ (MEDIUM)

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; "study objective/aim"	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Brasher et al. (2010); "To identify work-related and personal factors associated with occupational stress in submariners." (p.305)	Quantitative; survey study with data analysed using summary statistics, ANOVA and post-hoc tests, stepwise linear regression, independent t-tests, Mann-Whitney U test	United Kingdom; Law enforcement  <i>n</i> = 105, submariners (homogeneous)  Between January and May 2007	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants' occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (emotional comfort) Degree of peer support explored? General exploration (19 in-text references to <i>peer</i>) Definition of peer support? Clues on meaning provided Reference to: 1) form of peer support? No 2) work-related relations to cope with work issues? No 3) peer support inhibitors? Yes (work climate/experience)</p> <p>CASP score = 9 Measure of occupational peerness = 1 Overall appraisal score and rating: <math>(9 \times 0.9)/16 = 51\%</math> (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Cawkill (2004); “To elicit information on personal experience of stress and stress-related problems, stress education, pre- deployments briefings and post-incident stress debriefing.” (p.91)	Quantitative (descriptive); survey study with data summarised	United Kingdom; Law enforcement  <i>n</i> = 4 921, armed forces personnel (can’t tell)  Between September and December 2001	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <p>Positive influence on wellbeing? Yes (emotional comfort/knowledge exchange)</p> <p>Degree of peer support explored? General exploration (5 in-text references to <i>peer</i>)</p> <p>Definition of peer support? Clues on meaning provided</p> <p>Reference to:</p> <ol style="list-style-type: none"> <li>1) form of peer support? Yes (formal/informal)</li> <li>2) work-related relations to cope with work issues? Yes</li> <li>3) peer support inhibitors? Yes (culture/work climate)</li> </ol> <p>CASP score = 8</p> <p>Measure of occupational peerness = 2</p> <p>Overall appraisal score and rating: <math>(8 \times 0.8)/16 = 40\%</math> (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
		Sample size, occupation (participants’ occupation rating)	<b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b> <b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b> <b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b>
		Recruitment date	
Dowling et al. (2006); “To present psychological issues in law enforcement personnel, and a description of and data from a peer assistance outreach program” (p.151)	Quantitative (descriptive); survey study with data summarised	United States of America; Law enforcement  <i>n</i> = 28 232, police officers (homogeneous)  Between December 2002 and December 2003	Positive influence on wellbeing? Yes (emotional comfort) Degree of peer support explored? Formal program evaluation (15 in-text references to <i>peer</i> ) Definition of peer support? Clues on meaning provided Reference to: 1) form of peer support? Yes (formal) 2) work-related relations to cope with work issues? No 3) peer support inhibitors? Yes (work climate)  CASP score = 10 Measure of occupational peerness = 1 Overall appraisal score and rating: (10 x 0.9)/16 = 56% (MEDIUM)

**Table 4.**

Summary of the 16 studies identified for review (continued)

Reference; "study objective/aim"	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Greenberg et al. (2010); "To determine if the use of Trauma Risk Management led to any change in psychological health of personnel in the trial ships, and to (a) examining whether the intervention influenced personnel's stigmatizing attitudes, and (b) whether there was any effect upon organizational functioning." (p.431)	Quantitative; survey study with data analysed using summary statistics and chi-square tests	<p>United Kingdom; Law enforcement</p> <p>Twelve Royal Navy warships, matched for crew size and nature of operational duties, were randomly allocated, using a sealed envelope technique, into a six-ship intervention group and a six-ship control group (non- homogeneous)</p> <p>Trauma Risk Management training, for the six ships that received it, took place between December 2005 and March 2006. Data were obtained for the complete year before the trial began and for the complete year afterwards.</p>	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants' occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (emotional comfort) Degree of peer support explored? Formal program evaluation (8 in-text references to <i>peer</i>) Definition of peer support? Clues on meaning provided Reference to: 1) form of peer support? Yes (formal) 2) work-related relations to cope with work issues? No 3) peer support inhibitors? None</p> <p>CASP score = 10 Measure of occupational peerness = 3 Overall appraisal score and rating: <math>(10 \times 0.7)/16 = 44\%</math> (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
<p>Guest et al. (2011); “To (1) explore and quantify the amount of change needed in particular workplace features such as schedules, administrative support, and communication with peers and patients; (2) ascertain the relative importance of external sources of stress such as lawsuits, financial worries, and marital discord; (3) examine the balance between work and family life; and (4) identify modifiable factors and assess interest in interventions to reduce burnout and improve wellness.” (p.1237)</p>	<p>Quantitative; survey study with data analysed using summary statistics and Wilcoxon rank sum tests</p>	<p>United States of America; Health and medicine  <i>n</i> = 72, surgeons (homogeneous)  Recruitment date unknown</p>	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b> <b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b> <b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (emotional comfort) Degree of peer support explored? General exploration (7 in-text references to <i>peer</i>) Definition of peer support? Clues on meaning provided Reference to: 1) form of peer support? Yes (formal/informal) 2) work-related relations to cope with work issues? Yes 3) peer support inhibitors? Yes (work climate/experience)</p> <p>CASP score = 9 Measure of occupational peerness = 1 Overall appraisal rating: (9 x 0.9)/16 = 51% (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Howerton Child & Sussman (2017); “To identify patterns of feelings and behaviour of emergency department registered nurses who have experienced verbal workplace violence.” (p.545)	Qualitative; unstructured interviews with data analysed using Glaserian grounded- theory method	United States of America; Health and medicine  <i>n</i> = 28, emergency department nurses (homogeneous)  Between June 2014 and June 2015	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <p>Positive influence on wellbeing? Yes (connection/emotional comfort)</p> <p>Degree of peer support explored? Part of conclusion (9 in-text references to <i>peer</i>)</p> <p>Definition of peer support? Clues on meaning provided</p> <p>Reference to:</p> <ol style="list-style-type: none"> <li>1) form of peer support? Yes (formal/informal)</li> <li>2) work-related relations to cope with work issues? Yes</li> <li>3) peer support inhibitors? Yes (culture/work climate)</li> </ol> <p>CASP score = 17</p> <p>Measure of occupational peerness = 2</p> <p>Overall appraisal score and rating: <math>(17 \times 0.8)/18 = 76\%</math> (HIGH)</p>



**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Hsieh et al. (2016); “To (1) explore the associations among resilience, social support and depressive tendency in abused ED nurses in Taiwan; (2) intend to identify protective factors against depressive tendency to suggest interventions for nurses who suffer from workplace violence.” (p.2640)	Quantitative; survey study with data analysed using summary statistics, t- test, chi-square test and hierarchical linear regression analyses	Taiwan; Health and medicine  <i>n</i> = 159, emergency department nurses (homogeneous)  Between June 2013 and September 2013	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <p>Positive influence on wellbeing? Yes (emotional comfort/knowledge exchange)</p> <p>Degree of peer support explored? Part of conclusion (23 in-text references to <i>peer</i>)</p> <p>Definition of peer support? None</p> <p>Reference to:</p> <p>1) form of peer support? Yes (formal)</p> <p>2) work-related relations to cope with work issues? Yes</p> <p>3) peer support inhibitors? Yes (work climate/experience)</p> <p>CASP score = 10</p> <p>Measure of occupational peerness = 3</p> <p>Overall appraisal score and rating: <math>(10 \times 0.7)/16 = 44\%</math> (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; "study objective/aim"	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Hu et al. (2012); "To design an evidence- based intervention to address physician distress, based on the attitudes toward support among physicians at our hospital." (p.212)	Quantitative; survey study with data analysed using summary statistics and chi-square tests	United States of America; Health and medicine  <i>n</i> = 108, intensive care physicians (split into groups of emergency medicals, anesthesiologists and surgeons) (homogeneous)  Recruitment date unknown	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants' occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (connection/emotional comfort/knowledge exchange)</p> <p>Degree of peer support explored? Formal program evaluation (16 in-text references to <i>peer</i>)</p> <p>Definition of peer support? Clues on meaning provided</p> <p>Reference to:</p> <ol style="list-style-type: none"> <li>1) form of peer support? Yes (formal)</li> <li>2) work-related relations to cope with work issues? Yes</li> <li>3) peer support inhibitors? Yes (culture/work climate/experience)</li> </ol> <p>CASP score = 9</p> <p>Measure of occupational peerness = 1</p> <p>Overall appraisal score and rating: (9 x 0.9)/16 = 51% (MEDIUM)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
		Sample size, occupation (participants’ occupation rating)	<b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b>
		Recruitment date	<b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b>
			<b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b>
Jacobsson et al. (2020); “To analyse how recurrent health hindrance themes in the firefighter discourse, identified by firefighters themselves, relate to a set of policies about diversity, preventive work and education of firefighters, and to discuss the implications of these policy initiatives and the resistance against them in terms of firefighters’ health and well-being at work.” (p. 1)	Qualitative; focus groups, one-to-one interviews with data analysed using critical discourse analysis (CDA), and documentation data summarised using critical policy analysis	Sweden; Community services  <i>n</i> = 28, firefighters across focus groups (25 participants) and one-to-one interviews (3 participants) (homogeneous)  Recruitment date unknown	Positive influence on wellbeing? Yes (no details on how) Degree of peer support explored? Part of conclusion (3 in-text references to <i>peer</i> ) Definition of peer support? None Reference to: 1) form of peer support? No 2) work-related relations to cope with work issues? No 3) peer support inhibitors? Yes (experience)  CASP score = 11 Measure of occupational peerness = 3 Overall appraisal score and rating: $(11 \times 0.7)/18 = 43\%$ (MEDIUM)

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; "study objective/aim"	Research approach; research method and analysis	Place conducted; Occupational field  Sample size, occupation (participants' occupation rating)  Recruitment date	Summary of findings  Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour) Measure of occupational peerness (maximum 5, negative rating of information on participants' occupation, peer support definition and degree of peer support explored within studies reviewed) Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)
Kogien & Cedaro (2014); "To determine the psychosocial factors of work related to harm caused in the physical domain of the quality of life of nursing professionals working in a public emergency department." (p.51)	Quantitative; survey study with data analysed using summary statistics, chi-square tests, Fisher's exact tests, t- test and logistic regression	Brazil; Health and medicine  <i>n</i> = 189, emergency department nurses (homogeneous)  Recruitment date unknown	Positive influence on wellbeing? Can't tell (references to social support impacting wellbeing) Degree of peer support explored? General exploration (2 in-text references to <i>peer</i> ) Definition of peer support? None Reference to: 1) form of peer support? No 2) work-related relations to cope with work issues? yes 3) peer support inhibitors? Yes (work climate)  CASP score = 8 Measure of occupational peerness = 2 Overall appraisal score and rating: $(8 \times 0.8)/16 = 40\%$ (MEDIUM)

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Merandi et al. (2017); “To initiate a second victim support program starting in 2012. This article describes the collaboration with the University of Missouri Health Care researchers and the replication of the for YOU program.” (p.2)	Quantitative (descriptive); documentation data summarised	United States of America; Health and medicine  Second victim program provided to emergency department, perioperative department, intensive care unit’s (ICU), and surgical units (spread throughout all inpatient units as well as urgent cares, outpatient primary care clinics, and ambulatory speciality clinics) (non- homogeneous)  March 2014	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <p>Positive influence on wellbeing? Yes (connection/emotional comfort) Degree of peer support explored? Formal program evaluation (58 in-text references to <i>peer</i>) Definition of peer support? None Reference to: 1) form of peer support? Yes (formal) 2) work-related relations to cope with work issues? Yes 3) peer support inhibitors? Yes (work climate/experience)</p> <p>CASP score = 5 Measure of occupational peerness = 4 Overall appraisal score and rating: <math>(5 \times 0.6)/16 = 19\%</math> (LOW)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; "study objective/aim"	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Pinto et al. (2013); "To assess the personal and professional impact of surgical complications on surgeons." (p.1748)	Qualitative; semi- structured interviews with data analysed using interpretative phenomenological analysis (IPA)	United Kingdom; Health and medicine  <i>n</i> = 27, surgeons with specialization in general or vascular surgery, above registrar level with at least 3 years of experience (homogeneous)  Recruitment date unknown	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants' occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (connection/emotional comfort/knowledge exchange)</p> <p>Degree of peer support explored? Part of conclusion (5 in-text references to <i>peer</i>)</p> <p>Definition of peer support? Clues on meaning provided</p> <p>Reference to:</p> <ol style="list-style-type: none"> <li>1) form of peer support? Yes (formal/informal)</li> <li>2) work-related relations to cope with work issues? Yes</li> <li>3) peer support inhibitors? Yes (culture/work climate)</li> </ol> <p>CASP score = 15</p> <p>Measure of occupational peerness = 2</p> <p>Overall appraisal score and rating: <math>(15 \times 0.8)/18 = 67\%</math> (HIGH)</p>

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field  Sample size, occupation (participants’ occupation rating)  Recruitment date	Summary of findings  Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour) Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed) Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)
Ryu et al. (2020); “To investigate police officers’ stress levels, coping styles, and subjective well-being, including affect and life satisfaction, and to explore the interrelationships of these factors to determine how coping style influences a police officer’s subjective well-being.” (p.1)	Quantitative; survey study with data analysed using descriptive statistics, Pearson’s correlation coefficient, and Hayes’s PROCESS macro and a modal 4 bootstrap method to examine the mediating effect of coping in the relationship between job stress and subjective well-being	Republic of Korea; Law enforcement  <i>n</i> = 112, police officers (homogeneous)  Between August and September 2018	Positive influence on wellbeing? Yes (no details on how) Degree of peer support explored? Part of conclusion (1 in-text reference to <i>peer</i> ) Definition of peer support? None Reference to: 1) form of peer support? Yes (informal) 2) work-related relations to cope with work issues? No 3) peer support inhibitors? Yes (work climate)  CASP score = 11 Measure of occupational peerness = 3 Overall appraisal score and rating: $(11 \times 0.7)/16 = 48\%$ (MEDIUM)

**Table 4.**

*Summary of the 16 studies identified for review (continued)*

Reference; “study objective/aim”	Research approach; research method and analysis	Place conducted; Occupational field	Summary of findings
Santilhano et al. (2019); “To explore the phenomenon of peer support and its role and contribution as an effective response to addressing the emotional well-being of pilots.” (p.67)	Qualitative; semi- structured interviews with data analysed using Braun and Clarke’s thematic analysis (TA) method	South Africa; the commercial aviation industry  <i>n</i> = 9, associated with the peer program (four commercial aviation pilots, three mental health professionals, and two flight operations managers) (homogeneous)  Recruitment date unknown	<p><b>Critical Appraisal Skills Programme (CASP) score (maximum 18, positive rating of methodological rigour)</b></p> <p><b>Measure of occupational peerness (maximum 5, negative rating of information on participants’ occupation, peer support definition and degree of peer support explored within studies reviewed)</b></p> <p><b>Overall appraisal score and rating (CASP score combined with measure of occupational peerness, divided by maximum CASP score)</b></p> <hr/> <p>Positive influence on wellbeing? Yes (connection/emotional comfort/knowledge exchange)</p> <p>Degree of peer support explored? General exploration (140 in-text references to <i>peer</i>)</p> <p>Definition of peer support? Clues on meaning provided</p> <p>Reference to:</p> <ol style="list-style-type: none"> <li>1) form of peer support? Yes (formal)</li> <li>2) work-related relations to cope with work issues? Yes</li> <li>3) peer support inhibitors? (culture/work climate)</li> </ol> <p>CASP score = 14</p> <p>Measure of occupational peerness = 1</p> <p>Overall appraisal score and rating: <math>(14 \times 0.9)/18 = 70\%</math> (HIGH)</p>

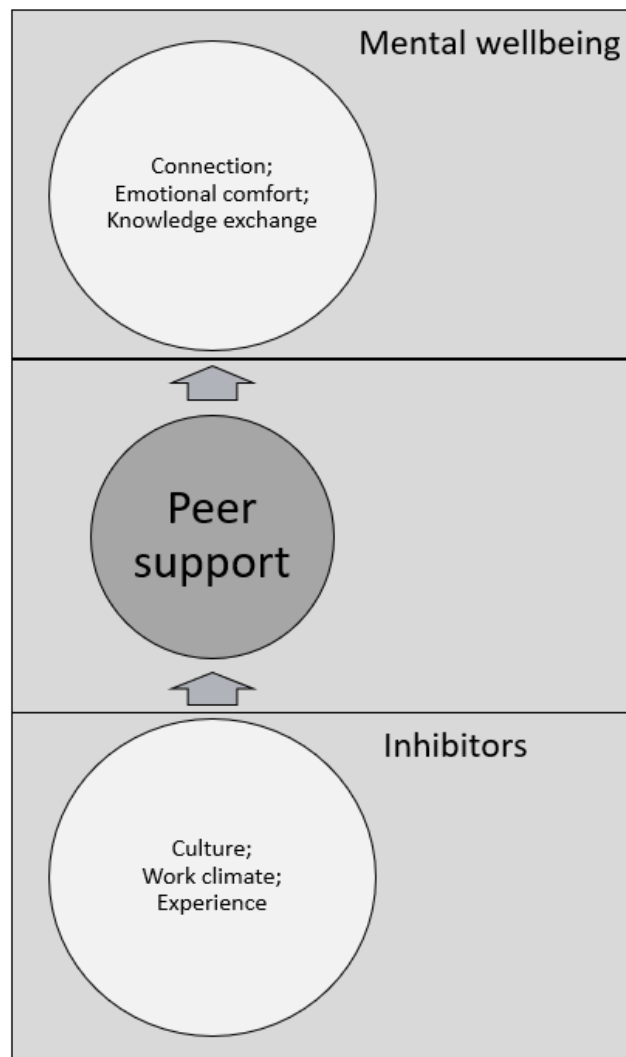


### ***2.3.1. Relationship between peer support in occupational high-risk environments and employee wellbeing***

Data extracts associated with peer support were iteratively analysed until two overarching themes were identified: *Mental health* and *Inhibitors*. The overarching theme *Mental wellbeing* represents references to psychological aspects that are applied by employees to ease negative influences of work on mental wellbeing and include three themes: *Connection*, *Emotional comfort* and *Knowledge exchange*. As such, this overarching theme aims to provide a description of how peer support has shown to positively impact employee wellbeing through a sense of identification with others, psychological consolation and or personal growth. The second overarching theme *Inhibitors* encompasses three themes (*Culture*, *Work climate* and *Experience*) identified to describe attributes shown to moderate the relationship between peer support and employee wellbeing associated with work in occupational high-risk environments, which are influenced by cultural, organisational and individual norms and values. Figure 3 provides a visual representation of overarching themes and themes related to findings on peer support in occupational high-risk environments and employee wellbeing. Detailed findings related to each theme are presented below.

**Figure 3**

*A visual representation of overarching themes and themes related to findings on peer support in occupational high-risk environments and employee wellbeing*



**2.3.1.1. Peer support and its positive relationship with employee wellbeing.**

The overarching theme *Mental wellbeing* represents references to psychological aspects found within fifteen studies that are used to ease negative influences of work on mental wellbeing (93.75%; Adams et al., 2015; Anderson et al., 2020; Brasher et al.,

2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Jacobsson et al., 2020; Merandi et al., 2017; Pinto et al., 2013; Ryu et al., 2020; Santilhano et al., 2019). In thirteen of these studies (81.25%; Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019), peer support and its relationship with wellbeing was discussed in detail. This included descriptions on how peer support decreases wellbeing issues associated with work through a sense of identification with others (*Connection*) (43.75% of the studies; Adams et al., 2015; Anderson et al., 2020; Howerton Child & Sussman, 2017; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019), psychological consolation (*Emotional comfort*) (81.25% of the studies; Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019) and or personal growth (*Knowledge exchange*) (37.5% of the studies; Anderson et al., 2020; Cawkill, 2004; Hsieh et al., 2016; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019).

By bringing feelings of safety (Anderson et al., 2020; Merandi et al., 2017; Santilhano et al., 2019) and understanding and empathy upon expression of emotions (Adams et al., 2015; Howerton Child & Sussman, 2017; Hu et al., 2012; Santilhano et al., 2019) peer support increases a sense of identification with others that help to prevent wellbeing issues associated with work. Connections with peers have also shown to benefit self-esteem, as uncomfortable work-related experiences that are

shared can be reassured (Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019) and normalised through humour or a sense of collective capability to move forward (Adams et al., 2015).

Psychological consolation as a result of peer support has shown to assist employee wellbeing when work issues are high. By inducing a sense of permission to talk through and accepting negative reactions caused by adverse events, peer support aid employees to process emotions (Adams et al., 2015; Merandi et al., 2017) and restore control (Adams et al., 2015; Anderson et al., 2020; Hsieh et al., 2016; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019). This, in turn, has shown to help employees to recognise solutions and commit to decisions that decrease work-related stress (Anderson et al., 2020; Hu et al., 2012; Pinto et al., 2013). Peer support has also shown to induce a greater sense of personal growth (Anderson et al., 2020; Cawkill, 2004; Hsieh et al., 2016; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019) through an interchange of information on how to resolve work issues and avoid committing mistakes that have already been identified by peers with shared occupational experiences (Santilhano et al., 2019).

In addition to findings demonstrating a direct relationship between peer support and wellbeing (through *Connection*, *Emotional comfort* and *Knowledge exchange*), peer support has shown to be used by employees to cope with existing wellbeing issues associated with work and or decrease the likelihood of having to experience wellbeing issues associated with work. This includes helping with restoring control when suffering from wellbeing issues associated with physical isolation (Brasher et al., 2010) or workplace abuse (Hsieh et al., 2016). Findings also show how employees reach for peer support to process negative emotions (Anderson et al.,

2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Santilhano et al., 2019) caused by external expectations (Howerton Child & Sussman, 2017; Hu et al., 2012; Merandi et al., 2017) and adverse events (Hsieh et al., 2016; Hu et al., 2012) such as involvement in medical errors (Hu et al., 2012) or critical incidents (Anderson et al., 2020; Cawkill, 2004; Dowling et al., 2006; Merandi et al., 2017; Santilhano et al., 2019). Second victim experiences associated with adverse events have also shown to prompt a need for peer support (Merandi et al., 2017). In sum, peer support has shown to help employees to take control of existing and future work-related factors prone to affect mental wellbeing (see Table 8 *Summary of findings* for a breakdown on how studies under review have connected peer support with employee wellbeing and the use of work-related relations to cope with work issues).

**2.3.1.2. Peer support inhibitors.** Contrary to expectations, 15 of the studies (93.75%) revealed attributes shown to moderate the relationship between peer support and wellbeing. This included attributes associated with *Culture* (Cawkill, 2004; Howerton Child & Sussman, 2017; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019), *Work climate* (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013; Ryu et al., 2020; Santilhano et al., 2019) and *Experiences* (Anderson et al., 2020; Brasher et al., 2010; Guest et al., 2011; Hsieh et al., 2016; Hu et al., 2012; Jacobsson et al., 2020; Merandi et al., 2017) (all themes presented within the overarching theme *Inhibitors*).

The impact of *Culture* is seen within personality preferences. That is, based on cultural norms and values, peer support providers ought to act in a certain way to be perceived as approachable (Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019). Culture is also visible in terms of expectations of employees operating in occupational high-risk environments. For example, employee-related errors and illness in an environment bound by pressures to deliver flawless results to protect the wellbeing of self and others create a high level of stigma. Perceptions of employees as immune to failures or consequences thereof have also shown to impact employees' willingness to seek peer support for wellbeing issues associated with work (Cawkill, 2004; Hu et al., 2012).

*Work climate* encompasses organisational commitment to peer support such as its priority in day-to-day work, promotion as a strategy to cope with work-related factors affecting wellbeing and quality-related maintenance (including supervision of peer supporters delivering peer support initiatives) (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Guest et al., 2011; Howerton Child & Sussman, 2017; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019). Organisational procedures have also shown to affect employees' perception of peer support. For example, lack of confidentiality has shown to hamper interest in sharing wellbeing concerns (Cawkill, 2004; Dowling et al., 2006; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019), especially when exposure can result in what is perceived by employees as severe career reprimands (Cawkill, 2004; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019).

Finally, previous experiences have shown to impact employees' need for peer support and peers' view of employees. Specifically, findings show how knowledge of

wellbeing issues or holding a certain skill set can fluctuate employees' need for peer support (Anderson et al., 2020; Brasher et al., 2010; Guest et al., 2011; Hsieh et al., 2016; Hu et al., 2012; Jacobsson et al., 2020; Merandi et al., 2017). Unique or visibly different personality traits or values have also shown to impact the influence of peer support on employee wellbeing, such as being the only female in a very male-dominated work environment (Guest et al., 2011; Jacobsson et al., 2020) (see Table 8 *Summary of findings* for a breakdown on how studies under review have covered factors that inhibits the relationship between peer support with employee wellbeing).

### **2.3.2. Appraisal ratings**

When exploring overall appraisal score and ratings reflecting methodological rigour and measure of occupational peerness (concerning information on participants' occupation, peer support definition and degree of peer support explored), it can be verified that only three of the studies (18.75%) reached a rating of *High* (Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019). Of the 12 studies rated *Medium* (75%), only six studies have got an overall rating of 50% or more (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Dowling et al., 2006; Guest et al., 2011; Hu et al., 2012). One study (6.25%) was rated as *Low* (Merandi et al., 2017) (see Table 8 *Summary of findings* for study specific details).

Of the quantitatively conducted studies ( $n = 10$ ; 62.5%), one study used documentation (Merandi et al., 2017) and nine studies surveys (Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Ryu et al., 2020) to collect data which was summarised deductively (Cawkill, 2004; Dowling et al., 2006; Merandi et al., 2017)

or analysed using descriptive statistics (Brasher et al., 2010; Greenberg et al., 2010; Guest et al., 2011; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Ryu et al., 2020). The six qualitative studies ( $n = 6$ ; 37.5%) encompassed three studies (18.75%) based on semi-structured interviews with data analysed through interpretative phenomenological analysis (Adams et al., 2015; Pinto et al., 2013) and thematic analysis (Santilhano et al., 2019). Two qualitative studies (12.5%) had data collected through focus groups and analysed using thematic (Anderson et al., 2020) and critical discourse analysis (Jacobsson et al., 2020). One qualitative study (6.25%) used unstructured interviews and grounded theory to collect and analyse data (Howerton Child & Sussman, 2017) (see Table 8 *Research approach; research method and analysis* for study specific details).

In terms of information on participants' occupation (used to assess occupational peeriness), eleven of the studies (68.75%) provided demographical variables enough to describe participants' profession (Brasher et al., 2010; Dowling et al., 2006; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Jacobsson et al., 2020; Kogien & Cedaro, 2014; Pinto et al., 2013; Ryu et al., 2020; Santilhano et al., 2019), which ranged from surgeons (Guest et al., 2011; Hu et al., 2012; Pinto et al., 2013), emergency department nurses (Howerton Child & Sussman, 2017; Hsieh et al., 2016; Kogien & Cedaro, 2014), emergency medicals (Hu et al., 2012), anesthesiologists (Hu et al., 2012), submariners (Brasher et al., 2010), police officers (Dowling et al., 2006; Ryu et al., 2020), firefighters (Jacobsson et al., 2020) to CAPs (Santilhano et al., 2019). Two studies (12.5%) did not provide information enough to be able to classify participants under exploration as members of the same occupational network. Participants within these studies are only known



to be employed as emergency medical dispatchers (Adams et al., 2015) or within armed forces (Cawkill, 2004). Three studies (18.75%) lacked details on occupation (Anderson et al., 2020; Greenberg et al., 2010; Merandi et al., 2017) and referred to ambulance (Anderson et al., 2020), naval service (Greenberg et al., 2010) and intensive care (Merandi et al., 2017) personnel only (see Table 8 *Occupation (participants' occupation rating)* for study specific details).

None of the studies reviewed has provided a full definition of *peer* or *peer support*. Eleven studies (68.75%) provided some form of description or clues on how *peer* and *peer support* ought to be interpreted (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019). For example, Dowling et al. (2006) have described peer supporters through their peer-based assistance program for police officers called the Police Organization Providing Peer Assistance (POPPA) as:

A confidential, voluntary, independent nondepartmental assistance program for the New York City Police Department (NYPD) has used volunteer police officers as peer support officers to help fellow officers overcome resistance to seeking assistance. Volunteer peer support officers have staffed a confidential 24-hour help line where an officer can call, arrange a meeting with a peer support officer to discuss any personal problem, and receive a referral for professional assistance. (p.151)

Five studies (31.25%) made extremely vague or no attempt at all to operationally define *peer* or *peer support* (Hsieh et al., 2016; Jacobsson et al., 2020; Kogien & Cedaro, 2014; Merandi et al., 2017; Ryu et al., 2020), including studies with several in-

text references to *peer* or *peer support* (Hsieh et al., 2016; Merandi et al., 2017). This has resulted in 10 studies (62.5%) interchangeably referring to different forms of work-related social support and how they related to employee wellbeing (including peer support) (Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Pinto et al., 2013; Ryu et al., 2020).

In line with information on participants' occupation and peer support definition, studies reviewed have attended to peer support to different degrees. When exploring in-text references to *peer* or *peer support*, findings reveal that 12 studies (75%) have recognised some kind of pre-planned initiative involving peer support (recorded as *formal*) (Anderson et al., 2020; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Ryu et al., 2020; Santilhano et al., 2019). Six studies (37.5%) have made references to individuals providing support on a day-to-day basis (recorded as *informal*) (Adams et al., 2015; Anderson et al., 2020; Cawkill, 2004; Guest et al., 2011; Howerton Child & Sussman, 2017; Pinto et al., 2013). Four studies (25%; Dowling et al., 2006; Greenberg et al., 2010; Hu et al., 2012; Merandi et al., 2017) have explored peer support in relation to peer support programs resembling Dowling et al. (2006)'s POPPA for police officers. Four studies (25%) have investigated peer support generally (Anderson et al., 2020; Cawkill, 2004; Kogien & Cedaro, 2014; Santilhano et al., 2019), whereas two studies (12.5%) have investigated peer support indirectly through the aim of exploring work-related social support on employee wellbeing (Brasher et al., 2010; Guest et al., 2011). Six studies (37.5%) have mentioned or discussed *peer* or *peer support* within their

discussion of findings or conclusion (mainly as a recommendation to sustain or increase employee wellbeing) (Howerton Child & Sussman, 2017; Hsieh et al., 2016; Jacobsson et al., 2020). No study was excluded based on appraisal rating, but outcomes associated with scores have been considered within the discussion of findings (see 2.4. *Discussion* and Table 8 *Summary of findings* for study specific details) (Whittemore & Knafl, 2005).

### **2.3.3. Setting**

Nine of the studies (56.25%) were conducted within medical environments (Adams et al., 2015; Anderson et al., 2020; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013), five studies (31.25%) within law enforcement (Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Ryu et al., 2020), one study (6.25%) within the CAI (Santilhano et al., 2019) and one study (6.25%) within community services (Jacobsson et al., 2020).

In terms of place conducted, 12 studies (75%) have mentioned and or discussed *peer* or *peer support* in occupational high-risk environments within Anglo-Saxon countries; United States of America (Dowling et al., 2006; Guest et al., 2011; Howerton Child & Sussman, 2017; Hu et al., 2012; Merandi et al., 2017), United Kingdom (Brasher et al., 2010; Cawkill, 2004; Greenberg et al., 2010; Pinto et al., 2013), Australia (Adams et al., 2015), New Zealand (Anderson et al., 2020) and South Africa (Santilhano et al., 2019). Two studies (12.5%) were conducted in Asia (Republic of Korea and Taiwan) (Hsieh et al., 2016; Ryu et al., 2020), one study (6.25%) in Scandinavia (Sweden)

(Jacobsson et al., 2020) and one study (6.25%) in South America (Brazil) (Kogien & Cedaro, 2014).

Finally, seven of the 16 studies (43.75%) were published within the last decade (2011 to 2021; Adams et al., 2015; Guest et al., 2011; Hu et al., 2012; Jacobsson et al., 2020; Kogien & Cedaro, 2014; Pinto et al., 2013; Santilhano et al., 2019). Of the nine studies reporting recruitment date or recruitment period, four studies (25%) were based on data older than ten years (< 2010; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010) and five studies (31.25%) were based on data collected within the last decade (2011 to 2021; Anderson et al., 2020; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Merandi et al., 2017; Ryu et al., 2020) (see Table 8 *Place conducted; Occupational field and Recruitment date* for study specific details).

## **2.4. Discussion**

An ILR (Whittemore & Knafelz, 2005) was conducted in December 2020 to analyse: 1) the relationship between peer support in occupational high-risk environments and employee wellbeing; 2) how peer support in occupational high-risk environments has been explored; and 3) type of occupational high-risk environments wherein peer support has been explored. Thus, the overall aim of this review has been to analyse empirical findings on peer support in occupational high-risk environments and its relationship with employee wellbeing. To achieve aim and objectives a systematic search for empirical studies on peer support in occupational high-risk environments in relation to employee wellbeing was undertaken, which resulted in 16 studies being identified and reviewed in relation to the following review question; what research has been conducted on peer support in occupational high-risk

environments in relation to employee wellbeing? Whilst discussing the outcome of this review, the term *peer support* is used to denote peer support in occupational high-risk environments.

Firstly, findings on the relationship between peer support in occupational high-risk environments and employee wellbeing (objective one) reveal an overall positive relationship between peer support and employee wellbeing (93.75%; Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Jacobsson et al., 2020; Merandi et al., 2017; Pinto et al., 2013; Ryu et al., 2020; Santilhano et al., 2019). An interaction between peer support and wellbeing has been identified wherein peer support can attenuate the effect of existing work issues on wellbeing or be used as a strategy to prevent the likelihood of experiencing wellbeing issues caused by work-related factors. Thus, peer support has shown to shield against work-related factors affecting or prone to affect wellbeing negatively (Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Santilhano et al., 2019), which agrees with previous research indicating a positive influence of social support on employee wellbeing (Demerouti et al., 2001; Johnson & Hall, 1988; Karasek, 1979; Luchman & González-Morales, 2013; van der Doef & Maes, 1998, 1999). Findings also show, however, how cultural aspects surrounding or connected to the individual gaining support can moderate the effect of peer support on employee wellbeing. The outcome of this review is, therefore, more in line with research suggesting that the impact of peer relations on employee wellbeing is highly dependent on employees' interpretation of self, the environment

and the interaction between self and the environment (Cohen & Wills, 1985; Howerton Child & Sussman, 2017). Thus, current findings reflect principles underlying the matching hypothesis, which highlights the importance of finding congruence between social support receiver's need(s) and provider's provision of social support to detect positive influences of peer support on wellbeing (Cohen & Wills, 1985; Gottlieb & Bergen, 2010; Uchino, 2004). As such, review findings can also be used to strengthen theory and research on peer support underpinned by peerness suggesting that identification with others can be built on different experiences as long as the experience is shared and creates a mutual sense of psychological connection (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Mead et al., 2001; Simoni et al., 2011).

Secondly, findings on how peer support in occupational high-risk environments has been explored (objective two) reveal a high reliance on deductively conducted studies using surveys (56.25%). Thus, review findings resonate well with methods commonly applied to evaluate the influence of social support on employee wellbeing. Specifically, with the Job Demand-Control (JDC) model (Karasek, 1979) being one of the oldest and most renowned theories within the field of occupational psychology (van der Doef & Maes, 1999) research on employee wellbeing has often been assessed quantitatively through self-reports in relation to one of two hypotheses: 1) the strain hypothesis predicting adverse health reactions when work-related tasks supersede one's perceived ability to manage work successfully; and 2) the buffer hypothesis presuming that one's latitude to complete work-related task (such as authority and autonomy) can buffer against adverse health reactions caused by excessive workload (i.e., job demands) (Bakker & Demerouti, 2017; Karasek, 1979; Luchman & González-

Morales, 2013). Through revised versions of the JDC model (Bakker & Demerouti, 2017; Demerouti et al., 2001; Johnson & Hall, 1988), encompassing a wider spectrum of resources predicted to buffer against job demands, research has explored and shown how work-related social support: 1) can promote motivation, learning and skill development when job demands are high; and 2) protect against motivational, learning and skill depletion overtime when job demands are low (Demerouti et al., 2001; Johnson & Hall, 1988; Karasek, 1979; Luchman & González-Morales, 2013; van der Doef & Maes, 1998, 1999).

Whilst current findings on peer support reflect theory and research on work-related social support and employee wellbeing derived through research on the strain and buffer hypotheses (Demerouti et al., 2001; Johnson & Hall, 1988; Karasek, 1979; Luchman & González-Morales, 2013; van der Doef & Maes, 1998, 1999), the meaning of peer support and the principles on which peer support operates remain questionable (Dixon et al., 2010). A disproportionately high number of deductively conducted studies increase the likelihood of overlooking aspects such as employees' subjective meanings and understanding of peer support through the world they live and work in (Braun & Clarke, 2013; Creswell, 2008). For example, despite tangible improvements such as decreased symptoms and hospitalisation a meta-analysis including 18 trials of community-based peer support programs delivered to a total of 5 567 individuals suffering from severe mental illness determined a weak relationship between peer support and mental health recovery. Positive findings including self-rated recovery, hope and empowerment were interpreted as outcomes prompted by variations between trials and reporting bias (Lloyd-Evans et al., 2014). In contrast, a narrative review encompassing both quantitative and qualitative studies and reviews

published between 1988 and 2010 (Miyamoto & Sono, 2012) showed a positive relationship between peer support and mental health recovery amongst adults with mental health difficulties. Whereas psychiatric methods were commonly used to measure tangible outcomes within deductive research, studies based on inductive methods tended to focus on perceived mental health recovery on individual and group-based levels (Miyamoto & Sono, 2012). Gidugu et al. (2015) is another study demonstrating the possibility to expose aspects of peer support often overlooked in deductive research. By using interviews and thematic analysis to explore worry and stress associated with daily tasks, Gidugu et al. (2015) were able to demonstrate the meaning and critical need of one-to-one delivered peer support to sustain mental health. Since research adhering to subjectivistic approaches to social science has shown to expose aspects of peer support often overlooked in deductive research (Braun & Clarke, 2013; Creswell, 2008; Dixon et al., 2010; Miyamoto & Sono, 2012), a greater number of studies based on inductive research methods are required to uncover the real potential of peer support. Qualitatively conducted studies should therefore be promoted as a method to add insight on peer support and its relationship with wellbeing (e.g., Dixon et al., 2010; Miyamoto & Sono, 2012).

With nearly half of the studies reviewed (43.75%) receiving a *Low to Medium* rating (i.e., a percentage of 50 or below) (Cawkill, 2004; Greenberg et al., 2010; Hsieh et al., 2016; Jacobsson et al., 2020; Kogien & Cedaro, 2014; Merandi et al., 2017; Ryu et al., 2020) it is difficult to ensure that OPS can be accountable for employees' description of wellbeing. As shown through measures of occupational peerness (i.e., difficulties in defining and adhering to a set definition of *peer* or *peer support*, limited information on participants assessed and varying degrees of peer support explored)



the relationship between peer support and employee wellbeing identified is complicated, which affects the ability to disseminate a reliable understanding of *OPS* and its relationship with *employee wellbeing in high-risk environments*.

It could be argued that difficulties in defining and adhering to a set definition of *peer* or *peer support* (e.g., Burke & Goren, 2014; Cutrona & Russell, 1990; Knox Haly, 2009; Sarason & Sarason, 2009; Siedlecki et al., 2014; Uchino, 2004; Williams et al., 2004) has contributed to the challenge of understanding how social support relate to wellbeing. Specifically, a number of studies reviewed (Anderson et al., 2020; Kogien & Cedaro, 2014; Pinto et al., 2013) have explored and interchangeably used poorly defined concepts associated with social support. *Peer support* has, for example, been used and mixed inconsistently with other terms such as *collegial support*. Adherence to clearly defined concepts under exploration and more information on participants assessed, such as job title and level of work experience, would have helped to unravel the theoretical complex picture of social support and its relationship with wellbeing (Knox Haly, 2009; Sarason & Sarason, 2009; Siedlecki et al., 2014; Williams et al., 2004). This, in turn, would have added insight on occupational peerness and OPS and its influence on employee wellbeing. It is therefore recommended that future research clearly define peer support and include a wider spectrum of demographical information on participants that can provide valuable knowledge on peerness and how individual differences influence the relationship between peer support and employee wellbeing (e.g., gender, age, nationality, occupation and professional seniority).

Despite limited information on participants' occupation and peer support definitions, it has been possible to identify degree of peer support explored. In-text references to *peer* and *peer support* show a range of informal and formal peer support

networks. This suggests that several direct and indirect social connections can have an impact on wellbeing, which agrees with theory on the structural and functional aspects of social support (Gottlieb & Bergen, 2010; Uchino, 2004). If compatibility between receiver's need(s) and provider's provision of peer support affects the shielding effect of peer support on employee wellbeing, it becomes crucial to understand the underpinning of peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) to gain a reliable understanding of how peer support relates to employee wellbeing. Consequently, current findings can be used to emphasise the importance of peer support on employee wellbeing but to fully understand the relationship between peer support and employee wellbeing, and to disseminate a reliable understanding of social support and its relationship with wellbeing, further research has to be conducted that clearly defines the functional and or structural aspects (Gottlieb & Bergen, 2010; Uchino, 2004) of social support explored. This includes references to structure and type of peer support recommended to promote employee wellbeing.

Third, and finally, findings on type of occupational high-risk environments wherein peer support has been explored (objective three) showed a high number of studies conducted on participants operating in medical high-risk environments (56.25%) and high-risk occupations associated with law enforcement (31.25%). One study encompassed individuals employed in a high-risk occupation within community services (6.25%). Similarly, only one study focused on peer support within the CAI (6.25%) (Santilhano et al., 2019). In this study, a positive relationship between peer support and CAP-related wellbeing was identified through four semi-structured interviews exploring CAPs' experience of providing peer support. None of the

participants had a background of receiving peer support from CAPs and no comments were made on the influence of peer support on CAP-related wellbeing beyond the South African aviation-related peer support program explored (Santilhano et al., 2019).

Findings are based on relatively recent data (revealed by recruitment period or publication date). Although, it should also be highlighted that several of the studies included for review have been conducted within Anglo-Saxon countries. The unbalanced range of high-risk environments and countries wherein peer support has been explored prompts further research on peer support and its relationship with employee wellbeing, especially when findings suggest that culture (Cawkill, 2004; Howerton Child & Sussman, 2017; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019), work climate (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013; Ryu et al., 2020; Santilhano et al., 2019) and experience (Anderson et al., 2020; Brasher et al., 2010; Guest et al., 2011; Hsieh et al., 2016; Hu et al., 2012; Jacobsson et al., 2020; Merandi et al., 2017) can moderate the relationship between peer support and employee wellbeing.

## **2.5. Conclusion**

The 16 empirical studies included within this ILR, shortlisted to help analyse empirical findings on peer support in occupational high-risk environments and its relationship with employee wellbeing, were primarily conducted deductively and focused on participants operating in medical high-risk environments. Moreover, the

studies varied considerably in methodological rigour and decisions made concerning OPS. As such, findings have been difficult to interpret in relation to employee wellbeing and should therefore be transferred across organisations and occupational cultures with care. Looking beyond the abovementioned limitations, however, findings can be used together with contemporary theory and research on social support and wellbeing (Knox Haly, 2009; Sarason & Sarason, 2009; Siedlecki et al., 2014; Williams et al., 2004) to build on the assumption that: 1) peer support underpinned by peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) based on occupational experiences (i.e., OPS) has a major influence on employees' sense of mental wellbeing; and 2) degree of positive mental wellbeing outcomes derived through occupational peerness varies depending on match between support receiver's need(s) and provider's provision of peer support. To verify these hypotheses, the studies included in this ILR indirectly urges researchers and practitioners to continue the exploration of OPS and its relationship with employee wellbeing inductively and in occupational high-risk environments that goes beyond the medical field.

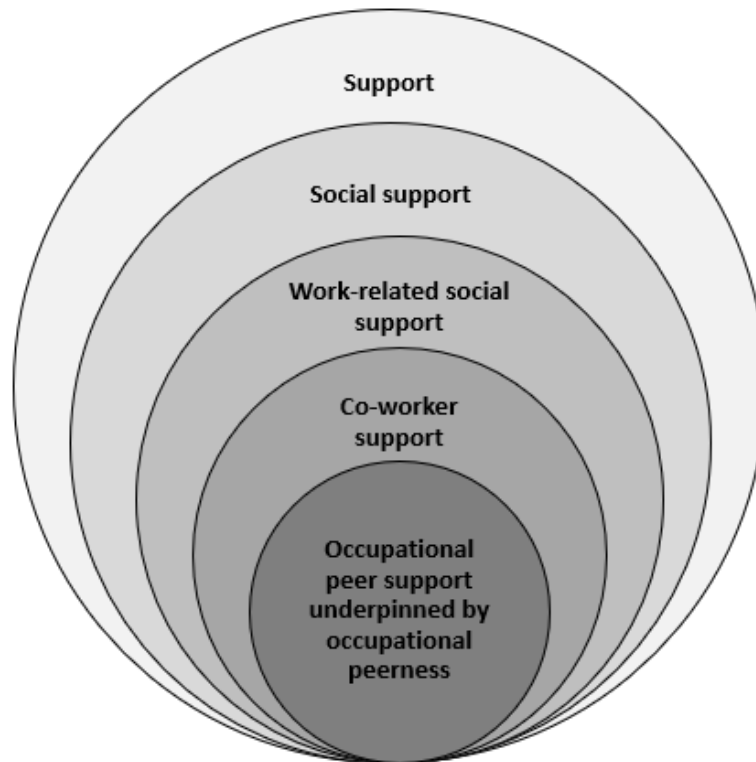
## **2.6. Present study**

To encourage COs to use peer support initiatives to decrease the risk of critical incidents associated with CAP-related mental wellbeing (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Kanki et al., 2010; Mitchell & Leonhardt, 2010; Santilhano et al., 2019) and to gain empirical knowledge on OPS, this PhD dissertation has set out to explore OPS in relation to employee mental wellbeing. To achieve this aim, mental wellbeing has been defined in accordance with a multi-

disciplinary review of wellbeing “as the balance point between an individual’s resource pool and the challenges faced” (Dodge et al., 2012). Similarly, to be able to differentiate peer support underpinned by different forms of peernesses, such as peerness based on occupational experiences (e.g., Cieslak et al., 2014; Conway & Weingart, 2009; Edrees et al., 2011; Elwood et al., 2011; Galek et al., 2011; Sirriyeh et al., 2010; Tatano Beck, 2011) from peerness based on experiences of mental illness (e.g., Simpson et al., 2014; Walker & Bryant, 2013), this study has defined peerness based on shared first-hand occupational experiences as *occupational peerness* and peer support underpinned by occupational peerness as *occupational peer support (OPS)*. In line with research on peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) and peer support within an organisational context (e.g., Cieslak et al., 2014; Conway & Weingart, 2009; Edrees et al., 2011; Elwood et al., 2011; Galek et al., 2011; Mead et al., 2001; Sirriyeh et al., 2010; Tatano Beck, 2011), OPS is viewed as a unique form of work-related social support shared between co-workers with an agreed sense of occupational peerness (see Figure 4).

**Figure 4**

*Visual demonstration of how occupational peer support underpinned by occupational peerness relate to support, social support, work-related social support and co-worker support*



Consequently, within this PhD dissertation OPS has been separated from peer support underpinned by peerness based on mental health-related issues (e.g., Beales & Wilson, 2015; Gidugu et al., 2015; Simoni et al., 2011; Simpson et al., 2014; Walker & Bryant, 2013) and is perceived as a unique form of work-related social support shared between co-workers that are *occupational peers*. This result in co-worker support being perceived as support derived through occupational peers and or non-occupational peers, whereas OPS is a term that may be used to describe support provided by occupational peers only. This could, for example, include the form of

work-related social support delivered by surgeons to surgeons to cope with the aftermaths of being a second victim (Hu et al., 2012; Pinto et al., 2013).

In line with the aim of this study, semi-structured interviews have been conducted to explore 1) the meaning of OPS in occupational high-risk environments and 2) CAPs' experience of OPS in relation to work-related mental wellbeing through the following research question; how is OPS experienced by CAPs in relation to work-related mental wellbeing? By exploring the research question with CAPs employed by major and minor regional and international COs, findings will provide empirical knowledge on how OPS in occupational high-risk environments can influence employee mental wellbeing. The outcome of this study can therefore be used to help prevent critical incidents associated with CAP-related mental wellbeing (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Kanki et al., 2010; Mitchell & Leonhardt, 2010), especially when the CAI struggle to find empirical evidence on peer support and its relationship with CAPs' ability to cope with work-related factors prone to affect mental wellbeing (Bor et al., 2016; Santilhano et al., 2019).

## **Chapter 3: Methodology**

### **3.1. Philosophical position**

To define the framework used to explore and gain knowledge of the social world, two sets of assumptions need to be considered; the nature of reality or being (ontology) and the nature of knowledge (epistemology) (Braun & Clarke, 2013; Burrell & Morgan, 1979; Robson, 2002). The objectivist approach aims to induce meaning by narrowing down information about the world into few categories or ideas, which is

achieved by formally, objectively, and systematically assessing the cause-and-effect relationships between variables to confirm a predisposed theory deductively (Burrell & Morgan, 1979; Saks & Allsop, 2019). This is in contrast to the subjectivist approach to social science, which relies on participants' perspectives of situations or matters being explored as the nature of knowledge and the stance we take on how we come to know about the world is believed to derive from individuals' subjective meanings and understanding of their experiences (through the world they live and work) (Braun & Clarke, 2013; Creswell, 2008). These are often very varied and multiple amongst participants assessed (Braun & Clarke, 2013; Bryman, 2012; Robson, 2002). As a result, researchers working within subjectivist approaches are urged to look for and work with intricacies found within individual perspectives rather than reducing understandings into a limited number of categories or concepts in order to develop theories agreeing with objectivists' view of social science (Bryman, 2012; Creswell, 2008).

Intellectual traditions within the subjectivistic approach apply its philosophical assumptions somewhat differently. For example, Weber (1947, as cited in Burrell & Morgan, 1979) believed in an ideographic methodological approach to social science that recognises elements of a shared understanding of social reality. As such, Weber (1947, as cited in Burrell & Morgan, 1979) leans more towards the objectivist approach to social science compared to, for example, Dilthey (1976, as cited in Burrell & Morgan, 1979) creating the term *Verstehen*. With understanding or *Verstehen* Dilthey (1976, as cited in Burrell & Morgan, 1979) proclaims that reality exists purely within individual consciousness and is only understood through interpretations of inner experiences.



This has resulted in a range of subjectivistic research strategies and designs to collect data.

To attain a holistic understanding of OPS in relation to employee mental wellbeing this study adheres to a nature of reality that is in line with Weber (1947, as cited in Burrell & Morgan, 1979) and critical realism, which views knowledge as constructed through the process of research (Braun & Clarke, 2013; Bryman, 2012). Only by recognising elements of a shared understanding of social reality will it be possible to attain data rich enough to explore the meaning of OPS in occupational high-risk environments and CAPs' experience of OPS in relation to work-related mental wellbeing. When considering detailed and complex subjective perceptions within a knowable world, a much deeper meaning of a phenomenon under exploration is achieved (Braun & Clarke, 2013; Burrell & Morgan, 1979; Creswell, 2008; Saks & Allsop, 2019). To reflect these needs, data in relation to participants' experiences of existing social and peer support networks has been collected through semi-structured interviews and has been explored inductively to answer the research question: how is OPS experienced by CAPs in relation to work-related mental wellbeing?

### **3.2. Setting and participants**

International Civil Aviation Organization (ICAO) is an organisation established in 1944 with the aim to induce international standards and recommended practices within aviation. Currently, 193 member states and globally dispersed COs have agreed on following these guidelines, which has influenced the development of CAP training and legally-enforceable aviation-related regulations used on local and national levels. This includes the need to acquire valid commercial pilot licenses with instrument

ratings to operate and the use of formally logged flight hours to measure professional experience (International Civil Aviation Organization, n.d.). As such, to ensure occupational peerness, CAPs eligible to take part in this study had to be employed by a CO or have a history of being employed by one or multiple COs and have a minimum of 1 000 hours of operating commercial aircrafts as an employed CAP. Moreover, since guardian approval was not sought for CAPs taking part in this study, participants had to be 18 years or older.

Three approaches were taken to recruit participants, through: 1) personal contacts; 2) snowballing; and 3) networks. In step one, participants were purposively recruited through the researcher. An invitation letter was sent to 21 personal contacts that fitted the inclusion criteria. Twenty-eight contacts that did not fit the criteria but were likely to know individuals eligible to take part in the study were sent a study information letter. All letters were sent virtually through email and had a participant information sheet, consent form and a pre-interview survey attached (see Appendix A for participant information sheet, consent form and pre-interview survey). To respect the voluntary nature of participation, non-respondents were sent one reminder letter two weeks after initial contact. No further action was taken if both attempts to connect were ignored.

In step two, participants were identified through snowballing (Braun & Clarke, 2013; Robson, 2002), that is, all contacts were asked (as per the invitation letter and the participant information sheet) to forward the study invitation to any other CAP likely to fit the inclusion criteria and having a potential interest to participate in the study (participants were also reminded of this at the end of interviews). To boost the chance of reaching individuals eligible to participate, step three was initiated and

included the use of a purposely created recruitment poster (see Appendix A) attached to a group invitation posted virtually on social media (i.e., Facebook), which consisted of the participation information sheet (attached as a document) and a short description of the study (based on the invitation letter). CAP-related networks (i.e., the European Association for Aviation Psychology (EAAP) and the Professional Pilots Rumour Network (PPRuNe)) were also approached virtually through email with a combined version of the invitation letter and the follow-up letter (including the participant information sheet and the consent form) and the recruitment-poster.

Participants were recruited from July 2016 and continued until theoretical saturation was reached in March 2018, resulting in a total of 26 participants (see section 3.5 *Data analysis* for more information on theoretical saturation). Of the participants, 22 were recruited through emails (six through personal contacts fitting the inclusion criteria), four through social media and zero through CAP networks. Interviews lasted for 35 to 109 minutes ( $M = 71$ ). To capitalise on interview time and ensure that participants met inclusion criteria, participants completed a short pre-interview survey comprising of demographic data (i.e., gender, age, civil status and country of residence) and work-related information (i.e., flight hours, seniority and size of employing CO) prior to interviews. The pre-interview survey was also used to assist in attaining information on individual differences that may influence study outcomes and contributions (i.e., knowledge on the relationship between occupational peerness and work-related mental wellbeing).

All except for two participants completed and return the survey (see 3.3. *Data collection* for details on survey administration and collection). Of the 24 participants who responded, six (25%) were females and 18 (75%) were males and their ages

ranged from 26 to 68 years old ( $M = 44.7$ ). Flight hours ranged from 1 300 to 26 000 hours ( $M = 9 200$ ). Twelve (50%) of the CAPs were captains, ten (38.5%) had a partner and eight (30.8%) children under 18 years old. In terms of country of residence, 12 (46.2%) were based in Europe, ten (38.5%) in North America and three (11.5%) in the Middle East. Twenty-two (84.6%) CAPs were flying for a large CO with 500 employees or more (see Table 5 for participant demographics).

**Table 5**

*Participant demographics of the full sample and divided between female and male commercial aviation pilots*

Participant demographics	Females		Males		Full sample	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
<b>Civil status</b>						
Alone	3	11.5	3	11.5	6	23.1
Partner	2	7.7	8	30.8	10	38.5
Partner and children < 18 years old	1	3.8	7	29.2	8	30.8
Unknown	1	3.8	1	3.8	2	7.7
<b>Seniority</b>						
First Officer	3	11.5	9	34.6	12	46.2
Captain	3	11.5	9	34.6	12	46.2
Unknown	1	3.8	1	3.8	2	7.7
<b>Country of residence</b>						
Europe	1	3.8	11	42.3	13	50
North America	6	23.1	4	15.4	8	30.8
The Middle East	0	0	3	11.5	3	11.5
Unknown	1	3.8	1	3.8	2	7.8
<b>Operator size (employees)</b>						
> 500	6	23.1	16	61.5	22	84.6
< 500	0	0	2	7.7	2	7.7
Unknown	1	3.8	1	3.8	2	7.7
	<i>n</i>	<i>m</i>	<i>n</i>	<i>m</i>	<i>N</i>	<i>M</i>
<i>Age</i>	6	50.7	18	42.7	24	44.7
<i>Flight hours</i>	6	13 533	18	8 786	24	9 200

*Note.* *N* = 26, whereof 24 participants responded to the pre-interview survey (*n* = 24).

### **3.3. Data collection**

Participants were informed about the study and its purpose over email, as well as the voluntary nature of participation and the process of obtaining consent. Upon interest to take part in the study, participants were asked to contact the researcher through the email address provided in the invitation letter, participant information sheet or recruitment poster. Email was also used to arrange type of interview (i.e., virtually over Skype or face-to-face) as well as date, time and (if face-to-face) location of the interview. The researcher adapted to participants' needs as far as possible. To ensure that the participants got sufficient time to go through the participant information sheet, complete the consent form and the pre-interview survey before interviews were held, suggested dates for interview were arranged to take place at least one week from receiving the reminder letter. The completed consent form and pre-interview survey were given to the researcher or sent to the researcher through email prior to face-to-face and virtual interviews, respectively. By asking participants to complete and return the pre-interview survey before interviews, it was possible to use demographic and work-related data to build rapport with participants and get into questions related to the aim and objectives of the study promptly. All except for one interview were conducted virtually over Skype. To accommodate needs, the face-to-face interview was arranged to take place at the participant's residence. Individuals reaching out to participate in the study after theoretical saturation would have been thanked by the researcher for their interest in participation and informed that recruitment had been closed.

All interviews commenced with a short brief of the study, which was followed by a review of the pre-interview survey and the consent form (to resolve potential

questions and or misunderstandings). Consent to take part in the study and permission to record the interview through an audio recorder were sought verbally before the second part of the interview commenced, which incorporated the semi-structured interview questions (see 3.4. *Ethical considerations* for more details on the process of gaining participants' informed consent to take part in the study). To adhere to the nature of critical realism (Weber, 1947, as cited in Burrell & Morgan, 1979), data was collected through an interview guide including questions that allowed supplementary and analytical themes for discussion to be generated. This helped to lead participants towards a richer and more nuanced conversation on OPS within already existing social support networks whilst ensuring that participants' subjective experience of how OPS relate to work-related mental wellbeing is captured during interviews. Thus, to meet study aim and objectives a semi-structured approach was adopted instead of a fully structured or unstructured approach (Bowling, 2009; Britten, 1995; Carter & Henderson, 2005; Robson, 2002). With this in mind, questions within the interview guide were initially based on work-related factors prone to affect mental wellbeing, OPS and the relationship between OPS and employee mental wellbeing. Although, to work in line with the ontological and epistemological stance adopted within this study (see 3.1. *Methodology*), these questions evolved over time to incorporate topics generated by participants.

The third and final part was used to wrap up the interview, that is, participants were thanked for their contribution and given information on next steps and how final results will be provided. Potential questions and concerns generated by participants during the interview were also covered and participants were reminded to forward the invitation letter and participant information sheet to any other CAP fitting the

inclusion criteria and likely to participate in the study (see 3.2. *Setting and participants* for snowballing and Appendix B for topics covered during interviews and examples of semi-structured interview questions).

### **3.4. Ethical considerations**

The study has gone through and passed an ethical approval for research involving direct contact with human participants established by the Faculty of Health and Medicine Research Ethics Committee (FHMREC) at Lancaster University (reference number FHMREC15088). By honouring all assurances and commitments made in the approved application, it has been ensured that the study has been conducted in the best interest of its participants. For example, with CAPs' work environment in mind (see 1.1.1. *Commercial aviation pilots: Work issues associated with mental wellbeing* for details), participants were given the option to be interviewed virtually. This allowed participants to select a time, location and environment that fitted their lifestyles. Virtually conducted interviews were also seen as a way to eliminate time spent on travelling to and from interviews when off work. As such, participants' needs were prioritised and taken into consideration despite challenges associated with non-physical meetings (e.g., rapport building based on limited body language indicating engagement, interest and approachability) (James & Busher, 2009).

Potential risks for the researcher were also taken into consideration by following guidelines specified in the Guidance on Safety in Fieldwork (The University Safety and Health Association, 2005). Being a study conducted off-campus, the researcher had to conduct interviews independently. To ensure a safe environment without risking participant confidentiality, the researcher agreed to conduct the one



and only face-to-face interview at the participant's residence after sharing location and expected start and finish times with a personal contact. Establishing time and position for the interview permitted the researcher to call upon support if needed and for personal contacts to inform appropriate authorities if the researcher was unreachable post-interview. Further steps to ensure researcher safety included: 1) the use of non-personal contact details throughout the research (i.e., the researcher's university email address and a Skype account created by the researcher to be used specifically for study-related purposes only); 2) regular supervision meetings to assess and re-assess any safety-related concerns; and 3) updated PhD supervisor contact details (in case of an emergent need to access and gain support with aversive effects derived through interviews).

The study and its purpose as well as the voluntary nature of participation and the process of obtaining consent were explained through email. To support this, the consent form, participant information sheet and pre-interview survey were attached to the invitation letter. By letting participants decide when to conduct interviews, ample time was given to get familiar with the information provided in writing and implications of informed consent. Nonetheless, as an extra precaution, participants were asked if they had any concerns regarding the information presented before informed consent was asked verbally and the second part of the interview commenced (i.e., the semi-structured interview questions). Participants were able to withdraw without providing a reason at any time during the interview. To withdraw, the participant interviewed face-to-face was asked to inform the researcher so that the audio recorder could be stopped in time. Being familiar with the Skype application prior to the conduct of this study, virtually interviewed participants were informed

that they could end the interview at any point in time by disconnecting from the Skype call through a simple mouse click on the hung-up button. In case of technical issues or internet access loss causing interruptions, participants were contacted through the chat option to validate the reason for disconnection. In all cases, participants acknowledged through the chat option that disruptions were involuntary and gave their approval to be reconnected through Skype to continue with the interview.

Confidentiality was considered by recruiting participants from a range of major and minor regional and international COs and primarily conducting virtual interviews at a location selected by participants. Participants were therefore unlikely to meet each other or acquaintances. Nonetheless, to maintain confidentiality during the study, virtually interviewed participants were warned during the interview brief about the risks of conducting interviews over the internet. The participant opting for a face-to-face interview was ensured confidentiality by allowing the meeting to take place at the participant's residence outside working hours. No withdrawal requests were received but if required, every attempt to extract information provided by participants during the study would have been taken up to the point of publication. To uphold promises regarding confidentiality, participants were informed in writing through the study invitation letter and verbally during the interview brief that confidentiality had to be compromised by speaking to PhD supervisors if the information shared during the study could be interpreted by the researcher as a threat to participant- and or researcher safety. If required, a warning of sensing significant risk of harm would have been provided by the researcher to the participant in advance of breaking confidentiality. The study invitation letter and the interview brief were also used to inform participants that confidentiality could be compromised if: 1) a request to

withdraw from the study comes after two weeks of participating in the study and information provided already been anonymised and incorporated into themes; and 2) when direct quotations from interviews are used within final publication alongside demographic information such as age, gender and seniority level. As such, participants were informed in advance that they could withdraw from the study without providing a reason, but only guaranteed full anonymity at any time before and up to two weeks of participating in the study.

To be able to guarantee anonymity and confidentiality, interviews were not transcribed until three weeks post-interview and personal details that could be used to connect participants with interviews were removed. Moreover, transcription was only conducted by the researcher and all interviews were allocated a reference number which was used to track data linked to participants throughout the study. To comply with the Data Protection Act 1998 (The National Archives, 1998), original audio-recorded interviews were deleted when copied from the recorder to Lancaster University's encrypted and password-protected server. Transcripts (original and anonymised), pre-interview surveys, consent forms and personal identifiers have also been stored securely on this server, which will be retained for 10 years as per general recommendation (i.e., in case of consultation post-examination and or future publications). Responsibility for storage and deletion of all material is handed over to supervisors when the study has been examined as a PhD dissertation. Until that stage, study-related material (including non-electronic data) has only been accessed by the researcher through confidential and personally selected passwords and a locked cabinet in the researcher's residence. Only anonymised material has been shared with supervisors. To be able to analyse data without access to Lancaster University's

encrypted and password-protected server, anonymous transcripts and pre-interview surveys have been stored as encrypted documents on personal password-protected computers (this material will also be destroyed once the research has been examined as a PhD dissertation).

No benefits or disadvantages were anticipated as a result of taking part in this study. Nonetheless, CAPs expressed a high level of interest in the topic and many were pleased to see it being explored in-depth. Some even shared a sense of relief to be able to reflect upon their experiences of OPS and its relationship with work-related mental wellbeing. Sharing personal experiences on past and or current needs of peer support to cope with work-related factors prone to affect mental wellbeing could, however, have prompted unhappy memories or reflections. The researcher paid attention to both verbal and non-verbal signs of this, but none were detected that required further actions (i.e., to pause the interview to begin a second debrief resulting in the interview continuing or ending). Despite participants' positive feedback on participation, actions were reflected upon and recorded within the Application of Ethical Approval for Research (FHMREC 15088) on how to deal with negative reactions during interviews (e.g., discomfort, distress and or danger). The participant information sheet included contact information to a support line in case of uninformed post-interview reactions. Precaution was also taken in terms of reimbursements for taking part in the study. To avoid coercion, none of the participants opting for a virtual interview was financially compensated. The participant choosing to be interviewed face-to-face was entitled to a maximum of £15 to cover transportation-related expenses. This was not necessary, however, since the interview took place at the participant's residence.

With the researcher being employed as a Business Psychologist and involved in CAP-selection at a major CO during recruitment and interviewing, conflict of interest was avoided by keeping email correspondence through an account registered at Lancaster University. Moreover, participants and third parties (e.g., CAP networks, CO management staff and union members) were ensured that recruitment and interviews will not take place during work hours or at sites associated with work (virtual and non-virtual). Individuals showing an interest in the study were also informed about the non-work-related purpose of conducting this study and the purpose (i.e., to achieve a doctoral degree) was reinforced to participants as often as necessary. Post-interviews, the researcher was prepared to withdraw from any involvement in selection processes encompassing participants. This would have been possible by changing working schedule with a colleague (a common practice to accommodate for ad-hoc work duties within the researcher's workplace).

Another ethical consideration that may have had an impact on this study is culture. To build rapport and avoid offensive reactions, the researcher tried to adhere to different traditions and norms during interviews and correspondence with participants by reflecting upon use of body and spoken language and social distance. Organisational and or professional culture may also have had an impact on the study in terms of reaching participants. Despite ethical approval by FHMREC, it was difficult to gain access to participants. Third parties showed extreme levels of scepticism towards being interviewed or forwarding the study invitation letter to potential participants due to a perceived risk of exposing self and or CAPs to negative consequences if openly disclosing social support needs and work-related factors prone to affect mental wellbeing. This could also explain the mediocre number of positive

responses from contacts invited to take part in the study that fitted the selection criteria (48%), despite reassurance on confidentiality and data management in writing through emails.

Finally, COs employing participants may question organisational confidentiality. Although, the study focuses on the importance of work-related peer support and did not include any questions that are tailored to the organisational culture or employ CO. The study has focused on CAPs' experiences of OPS gained through work across one's career and its effect on work-related mental wellbeing, rather than the effect of OPS and its influence on mental wellbeing within a particular organisational setting. Moreover, participants employed by the same CO are likely to be a fraction of the CO's entire pool of employed CAPs. This is believed to ensure COs confidentiality, even if references to organisational cultures are made.

### **3.5. Data analysis**

Data collected was analysed using Braun and Clarke's (2006) inductive thematic analysis. Although presented as a linear step-by-step process of analysis, this is a non-linear iterative and reflexive approach to data analysis aimed at identifying themes and patterns that are reflective of participants' subjective meaning and understanding of personal experiences occurring in life (Braun & Clarke, 2006, 2013) which meets the ontological and epistemological stance adopted within this PhD dissertation (i.e., critical realism and constructivism). Thus, data collection and five of the six phases of Braun and Clarke's (2006) analysis presented below were undertaken concurrently until theoretical saturation (Francis et al., 2010), resulting in phase one to five being revisited until themes and patterns identified within the analysis of newly

gathered data started to repeat itself (Francis et al., 2010) and therefore deemed to be a legitimate reflection of the entire dataset collected to answer the research question (Braun & Clarke, 2006).

*Phase one.* To get familiar with the data collected for analysis, the 26 audio-recorded interviews were transcribed by the researcher using the computer software f4 (Audiotranskription, n.d.). During transcription, a notation system including a notation key (Braun & Clarke, 2013) was created to convert interviews into anonymous transcripts (or data items) deemed to be good enough representations of original recordings and therefore ready for analysis. Non-verbal utterances such as *Hmm*, *Aha* or *Oh'* were omitted from transcripts as the epistemological stance taken within this study does not require analysis of participants' use of language to understand how OPS is experienced by CAPs in relation to work-related mental wellbeing. To meet the needs of an experimental qualitative study, with the intention "to make sense of how the world is seen, understood and experienced from the person's perspective" (Braun & Clarke, 2013, p. 24), only verbal utterances made by the interviewer (i.e., researcher) and the interviewees (i.e., participants) were transcribed alongside pauses. Indistinct comments were only marked as inaudible.

*Phase two.* Transcripts deemed ready for analysis by the researcher were uploaded for exploration in ATLAS.ti (ATLAS.ti GmbH, 2021), a computer-aided qualitative data analysis software. Specifically, data items were explored and data extracts identified that related to the research question and coded systematically. Data item by data item initially, and then across the entire dataset. During this process, similar codes were collated and rearranged to avoid having multiple codes representing the same meaning of data extracts. To facilitate this process codes

created were named, defined and provided with a description (including a data extract capturing its meaning). Data extracts that appeared to be relevant to the research question but unrelated to any of the existing codes were coded as *Miscellaneous*. When additional data items were added for coding and coded, data extracts coded as *Miscellaneous* were scrutinized and (if deemed to be connected with topics associated with the research question) used to devise new codes to be included for analysis. As such, all data extracts identified for coding were coded and considered before being included for analysis or discarded as unimportant (i.e., tapping into a topic unrelated to the research question). This process resulted in initial codes being a close reflection of participants' experience of OPS and its relation to work-related mental wellbeing, combined with the researcher's previous experience of research and theory associated with the research questions such as social support as a job resource and its impact on employees' experiences of job demands (see Table 6 for examples of codes used to categorise data extracts during initial analysis in phase two).



**Table 6**

*Example of initial codes with names, definitions and descriptions used to collate data extracts into categories representative of the entire dataset collected for analysis during the study*

Codes	Definition and description
Job demands	Work-related factors with a negative influence on mental wellbeing: Factors associated with work (during or outside work hours) that have a negative impact on CAPs' subjective interpretation of one's mental wellbeing
Job resources	Work-related factors with a positive influence on mental wellbeing: Factors associated with work (during or outside work hours) that have a positive impact on CAPs' subjective interpretation of one's mental wellbeing
Occupational peer support	Support from another CAP: When a CAP approaches or is approached by another CAP for support on a work-related factor

To increase trustworthiness (Braun & Clarke, 2013; Bryman, 2012) codes were added, collated and rearranged until data extracts identified did not contribute to any further codes capable of contributing to new categories representing the dataset.

*Phase three.* In phase three, descriptive and latent codes deemed vital to answer the research question were once again explored, collated and arranged to create themes aimed at demonstrating patterns of conceptual meanings representative of the data collected. Phase two was repeated if data extracts did not seem to fit codes encompassing a theme identified. The themes (Braun & Clarke, 2006, 2013), in turn, were arranged and re-arranged to identify central organising concepts capturing a consistent and hence meaningful interpretation of the entire dataset (in relation to the research question) (Braun & Clarke, 2013).

*Phase four.* At the fourth phase, initial themes were reviewed and verified by ensuring that the conceptual meanings of themes were idiosyncratic and good representations of codes and data extracts allocated under each and every theme. Phase three was repeated when coded data extracts that did not fit themes were identified. To provide a visual representation of central organising concepts identified within the data set, a thematic map of the analysis was created including overarching themes, themes and subthemes (Braun & Clarke, 2006, 2013).

*Phase five.* To ensure a rigorous analytical process with final themes being a representation of the entire data set, the fifth phase focused on defining and refining identified themes so that they reflect idiosyncratic (themes and subthemes) and collective contributions (overarching themes) to the central organising concepts identified by the researcher. As such, the analysis was deemed complete when theoretical saturation was reached (Braun & Clarke, 2013), that is, when data extracts did not contribute to novel codes in phase two or coded data extracts did not contribute to novel themes in phase three, which would have been capable of altering the research-derived central organising concept aimed at representing the overall story identified within the dataset at phase four (Braun & Clarke, 2013; Francis et al., 2010). Clear definitions and names were finally given to reflect the conceptual essence of each theme identified at phase five (Braun & Clarke, 2013).

*Phase six.* Phase one to five prepared for phase six, wherein a final version of the thematic map of the analysis was created (see Figure 5 in *Chapter 4: Findings*) and discussed in relation to the research question alongside previous research and literature on peer support and mental wellbeing (see *Chapter 5: Discussion*). To present the final analysis in a logical and well-founded manner that is representative

of the entire dataset, two overarching themes were generated aimed at representing the conceptual meaning of two themes each. Two subthemes were also created to capture specific aspects deemed to be of significant value in relation to two of the four themes. Data extracts considered to be a good representation of themes were also selected and converted into quotations to be presented alongside the discussion on how themes relate to each other and the research-derived central organising concept associated with the research question (see *Chapter 4: Findings*) (Braun & Clarke, 2006, 2013).

By adhering to these six phases, it is believed that anecdotal interpretations of the dataset collected to answer the research question have been avoided and findings can be used to attain a better understanding of how OPS is experienced by CAPs in relation to work-related mental wellbeing (see Table 7 for a summary of all six phases applied to data analysis and Appendix C for an illustration on how data analysis evolved over time).

**Table 7**

*Phases applied to data analysis, based on Braun and Clarke's (2006) six phases of analysis*

Phase	Description of the process
1. Getting familiar with data items	<ul style="list-style-type: none"><li>- Data transcribed using f4</li><li>- Reading and re-reading transcribed data</li><li>- Initial patterns identified and noted</li></ul>
2. Generating initial codes	<ul style="list-style-type: none"><li>- Transcripts uploaded in ATLAS.ti</li><li>- Data extracts associated with the research question coded systematically across the entire dataset</li><li>- Coded data collated and rearranged to fit the entire dataset</li></ul>
3. Searching for themes	<ul style="list-style-type: none"><li>- Descriptive and latent codes collated into potential themes</li><li>- All data extracts relevant to the research question and each potential theme gathered and summarized</li></ul>
4. Reviewing themes	<ul style="list-style-type: none"><li>- Verifying that themes identified reflect coded data extracts within data items and the entire dataset</li><li>- Generating a reflective thematic map of the analysis</li></ul>
5. Defining and naming themes	<ul style="list-style-type: none"><li>- Themes identified defined and refined to reflect idiosyncratic and collective contribution to the overall story expressed by participants within the entire dataset</li><li>- Clear definitions and names for each theme created</li></ul>
6. Producing the report	<ul style="list-style-type: none"><li>- A final thematic map of the analysis created (see Figure 5 in <i>Chapter 4: Findings</i>)</li><li>- Data extracts selected to represent final themes identified (see <i>Chapter 4: Findings</i>)</li><li>- Final thematic map discussed in relation to the Research question alongside previous research and literature on peer support and mental wellbeing (see <i>Chapter 5: Discussion</i>)</li></ul>

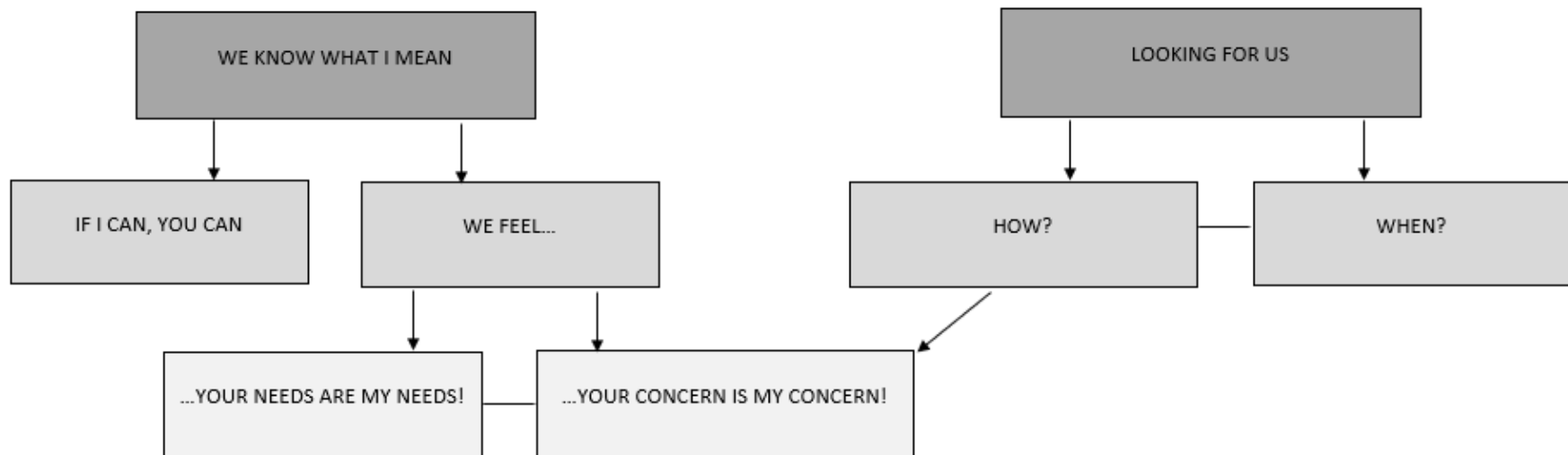
## Chapter 4: Findings

### 4.1. Overview of themes

Two overarching themes, four themes and two subthemes were identified through analysis of data collected to answer the research question: how is OPS experienced by CAPs in relation to work-related mental wellbeing? The relationship between themes have been displayed visually in Figure 5 and are discussed in detail within the following sections in this chapter alongside quotations from participants. Vertical arrows demonstrate hierarchical relationships, horizontal lines signal close lateral relationships and the bi-directional arrow indicates a close relationship between a theme and a subtheme belonging to different overarching themes. Writing in square brackets within quotations aim to clarify references made by participants (e.g., they [CAPs] ), whereas three consecutive dots in square brackets signify a pause and or omitted utterances such as repeated words. Letters and numbers in brackets after quotations signify individual participants' rank (FO for first officer and CPT for captain), age (a number for years) and gender (F for female and M for male).

**Figure 5**

*Relationships between overarching themes (dark grey), themes (grey) and subthemes (light grey) identified through analysis of data collected on commercial aviation pilots' experience of occupational peer support and its relationship with work-related mental wellbeing*



#### **4.1.1. *We know what I mean: The psychological connection between self and occupational peers gained through occupational peer support***

The overarching theme *We know what I mean* represents the psychologically strong connection gained through OPS between self and occupational peers, which is necessary for CAPs to practically and mentally be able to cope with work-related factors prone to affect mental wellbeing. By referring to shared first-hand occupational experiences, OPS has been described by CAPs as a form of work-related social support that helps to build a strong sense of psychological connection with occupational peers which is essential to cope with work issues associated with mental health deterioration:

They [CAPs] understand the issues [...] we're [CAPs are] very much into tribal narrative, verbal traditions you know, the greatest things we learn are other [commercial aviation] pilots telling stories about things they saw and have happened to them, it goes back to the whole idea of the apprentice master [...] the tribal narratives are crucial to the maturing of the business, of what we do and also keeping up with its incredible dynamic mix of change, because what we knew 37 years ago is not necessarily applicable today. (CPT:61:M)

For this and other participants, the strong psychological connection gained through OPS between self and occupational peers seems to be instigated through shared first-hand occupational experiences associated with professional development and understanding of the work environment surrounding CAPs.

The theme *If I can, you can* aim to reflect professional development through occupational peers and how this supports the psychological strong connection between self and occupational peers gained through OPS, by facilitating CAPs' sense

of ability to mentally and practically apply skills to cope with work-related factors affecting mental wellbeing. If given the opportunity, CAPs seek and strive to learn from occupational peers, resulting in an exchange of knowledge on how to cope with lower levels of mental wellbeing caused by work. One participant said, for example, that “there’s nothing like having some feedback from some [occupational] peers, that [it] is just priceless” (FO:60:F) and many more reported in line with this participant that:

There are different experiences, everybody [CAPs] brings different experiences into the cockpit so I always look at somebody [CAP] new as a new challenge, as a new learning tool [...] and it's amazing some of the stories [...] we're all learning from each other [CAPs], and when you quit learning, you may as well be dead. (CPT:69:F)

Many participants identified and used OPS as a mental shield to regain, protect or build self-esteem as a professional when trying to cope with work issues affecting mental wellbeing. A first-officer mentioned, “in that particular case I knew there were 25 other women [CAPs] who said ‘oh my god you need to put a stop to that’ so I have 25 invisible people behind me, who you know, all have my back” (FO:59:F).

Participants were also keen to highlight positive emotions gained by receiving and providing OPS to help professional growth, as described by a female captain: “I choose to spend social time with them [CAPs] [...] once a month we got together [...] it was wonderful to meet and to enjoy sharing the stories” (CPT:64:F). By continuing to describe the value of being a mentor to junior CAPs experiencing work issues:

To be a mentor to those coming up, that had some challenges, I enjoy being able to mentor those coming up as well as share the stories of the past for



those that never experienced it, so there is a lot of value, to help inspire the next generation. (CPT:64:F),

the participant describes a common feeling of how OPS can provide much more than a sense of psychological confidence and proficiency to cope with current work issues. In addition, professional development derived through OPS seems to support CAPs with mental skills on how to avoid work-related situations previously experienced by occupational peers as destructive to mental wellbeing. For example, being “locked up in a room for 12 hours with somebody” (CPT:44:M) have resulted in CAPs sharing advice on how to cope with physically close and isolated work with an unfamiliar CAP (or CAPs) for hours. To avoid work issues associated with interpersonal conflicts, many participants have learnt directly and indirectly through OPS how to select topics of conversation that induces a sense of courtesy towards individual differences:

I try to stay away from the magic three [...] the naughty three, religion politics and sex [...] it's not good subjects, especially if you don't really know the person [CAP] [...] stay away from those and you're gonna have good conversations. (FO:46:M)

As such, OPS is often used to gain knowledge on how to be diplomatic and use humour to create working atmospheres that endorses mental wellbeing:

Besides the venting, and besides the fact that you learn stuff, you get to laugh about things because you would inevitably make jokes, you know ‘that was really clever’ and you start laughs and that diffuses the situation on your part, you know that knot in your stomach, that kinda tends to go away, that’s always a good thing. (FO:60:F)

Consequently, findings show how CAPs strive to learn from and share knowledge with CAPs to support each other through current and prospective work-related factors prone to affect mental wellbeing. This suggests that OPS is used to develop own and occupational peers' professional ability to confidently cope with work issues affecting mental wellbeing negatively and to avoid work-related factors prone to affect mental wellbeing. This includes the ability to cope with expected and unexpected mental and or practical work-related situations when physically separated from occupational peers, such as making and committing to complex decisions or working with unfamiliar team members in-air.

The theme *We feel...* captures occupational peers' understanding of the work environment and how this supports the psychological strong connection gained through OPS between self and occupational peers, by facilitating CAPs' sense of ability to share mental concerns required to cope with work-related factors affecting mental wellbeing negatively. When asked about social support and its influence on coping with work issues, participants commonly referred to frustrations with having "to explain it to somebody who doesn't know, what it is exactly that I'm trying to explain" (CPT:45:F). Getting non-occupational peers to understand work issues takes "more of my energy" (CPT:45:F) and often, as a result, is "not worth the aggravation" (CPT:45:F). The underlying reason for this is the effort required to commit to explicit descriptions of CAP-related situations alongside in-depth thoughts, behaviours and principles without a guarantee of being understood:

She [a CAP] would be able to put herself into [it], and know exactly what it is, without me having to explain a whole bunch of stuff, so if I were to say this is this information, she would like right away get it. (CPT:45:F)

Another quotation from the same participant is here presented at length, as it clearly demonstrates the difficulty to understand and hence provide CAPs with adequate work-related support when shared first-hand occupational experiences are missing:

It's a very difficult stretch ball, it's different time zones, so when she [a CAP] comes home and she wants to rest, she doesn't have that freedom to be able to say 'oh ok I need to rest' because he's demanding her to start doing things around the house, so she doesn't have that support system that she would be able to get from another [commercial aviation] pilot, if she were to be with another [commercial aviation] pilot, because that understanding of night shifts, the time zones and time away from home, the quality of sleep at hotels, none of that is actually luxuries or glamorous [...] your partner, if he or she isn't in the [commercial aviation] industry, then it makes it very difficult, cause all they [non-CAPs] see is you being away, so putting on the uniform, taking your roller bag and being on the way, and that's what they see instead of like really the hardship of the job itself. (CPT:45:F)

Participants have referred to several work-related factors that are difficult for non-occupational peers to assist with, which can be divided into two groups if dealt with inappropriately: profession-related and employer-related. Certain work-related factors, such as fatigue mentioned within the quotation above, can fall within both categories: caused by jetlag (profession-related) or rostering impeding on work-life balance and social relations (employer-related).

Non-occupational peers' difficulties in supporting CAPs through some very common work-related factors illustrate CAPs' negative perception of non-occupational peers' capacity to support with work-related mental wellbeing. Majority

of participants describe how occupational peers' understanding of the work environment help to smoothly establish and maintain strong psychological connections between occupational peers. With none to minimal efforts, shared first-hand occupational experiences give occupational peers an almost 'inherent' ability to "understand it, the frustrations and the stresses" (CPT:45:F) associated with work-related factors affecting mental wellbeing negatively. The portrayal of 'just getting it' supports the psychological strong connection described and gained through OPS between self and occupational peers, and CAPs' perception of OPS as fundamental to feel confident enough to share sensitive concerns associated with work-related factors affecting mental wellbeing negatively.

For many participants, a major benefit of effortlessly being able to establish strong psychological connections with occupational peers is quick access to practical and mental support to cope with work. Near to all CAPs have described how occupational peers' potential to lean on personal experiences of being a CAP results in being the "only people that can truly understand the complexities, of a dynamic decision-making process in face of conflicting and dynamic information" (CPT:60:M), which creates a unique ability to support other CAPs with mental strategies on how to cope with work-related factors (or consequences of going through work-related factors) affecting mental wellbeing. In this way, OPS create strong psychological connections that are based on a practical and psychological understanding of CAP-related work issues, resulting in occupational peers commonly being rated as the only support providers that can provide functional and compassionate support to cope with work-related factors affecting mental wellbeing:

You belong together [CAPs] and therefore you support each other one way or the other, cause again the main problems are the same for everybody [CAPs] and they come and go, and someone has a relationship issues, someone's got a kid, there is someone whatever it might be, but the big things are always the same, you kind of understand each other. (CPT:39:M)

The subtheme *...your needs are my needs!* intend to demonstrate occupational peers' ability to empathise with work-related factors prone to affect mental wellbeing and how this supports occupational peers' understanding of the work environment, by facilitating CAPs' sense of ability to express negative emotions associated with work issues impacting mental wellbeing. Most participants felt that there is a connection between occupational understanding and empathy as "you [as a CAP] can have empathy for it because you've probably gone through it before, management might at best sympathies with you but they might not understand it, because they're not going through it" (CPT:39:M). Many reported a form of 'linear relationship' between shared first-hand experiences as a CAP and a sense of ability to empathise with CAPs' work environment, that is, as occupational peerness increase so does support providers' ability to provide and induce a compassionate sense of understanding work-related factors. For many CAPs, this hypothetical relationship has resulted in OPS being more often sought than other forms of social support:

I would tend to [...] lean more towards the [commercial aviation] pilots cause they would understand what I was saying as supposed to my friends that aren't [commercial aviation] pilots [...] I think it just helps to get it off your chest and just be like 'ok yeah that guy is a jerk' or how to deal with them or maybe next

time, how to do it, you know, what you've [another CAP] tried to be helpful.  
(FO:41:F).

The above quotation clearly illustrates the difference in how CAPs view occupational peers' and non-occupational peers' ability to show empathy towards work issues and grasp negative consequences of work issues on mental wellbeing. With indirect occupational experiences, non-occupational peers are often perceived to have limited capacities to genuinely understand the work environment and hence ability to provide compassionate support to CAPs experiencing mental wellbeing-related issues associated with work:

I don't think you [CAPs] would have got that real understanding from people who are outside cause they [non-CAPs], many who don't fly, think we are robots, that we sit like this with a hat on and it's like you know, that it is so [...] if there is someone who makes a mistake it's like this 'oh you made a mistake, you know that you have made a mistake' now we should write a bloody report and they forget that humanity is a big part of it. (FO:37:M)

As a result, findings suggest that support providers need to have both a practical and psychological understanding of the work environment to be able to provide support that is perceived as helpful or beneficial in terms of coping with mental wellbeing-related issues associated with work.

With occupational and non-occupational peers' distinct capacities to instigate a sense of empathy towards work issues experienced, occupational peerness is also used by CAPs to express negative emotions associated with work-related factors affecting mental wellbeing:

We would normally listen to each other, and how to deal with it, should we bring this forward to the management or not, should we propose a change, should I resign or not, you would very often deal with these kinds of questions on the flight deck, we would be in the same, not boat but we would be in the same plane kind of, the same situation, so of course, we would use each other to ventilate. (CPT:44:M)

Several participants indicated how empathy with work issues induce a psychological strong connection between CAPs which is mixed with identification with work issues, resulting in CAPs' sensing an ability to express negative emotions associated with work-related factors affecting mental wellbeing negatively to familiar and unfamiliar occupational peers:

It's new people [CAPs] almost every day, it's like, if you tell someone something that he [CAP] will probably not talk about it with another person, so then it's like really open [...] it's just that we're in the same situation, kind of, and you have that, that people are really like eager to help. (FO:29:F)

Empathy and identification with work issues combined suggest a moral tension between reality and the presumption of being able to speak plainly with occupational peers without having to face negative professional and or personal consequences. Thus, in addition to demonstrating CAPs' view of OPS as a shortcut to be understood on a compassionate level, findings also highlight how occupational peers' ability to empathise with work-related factors affecting mental wellbeing causes an unspoken (and sometimes harmful) expectation of trustworthiness.

The subtheme *...your concern is my concern!* aim to show occupational peers' ability to identify with work-related factors prone to affect mental wellbeing and how

this supports occupational peers' understanding of the work environment, by facilitating CAPs' sense of ability to express concerns associated with work-related factors known to be sensitive and harmful (or most likely harmful) on a mental level. When asked about factors creating CAPs' confidence in occupational peers, a participant referred to a sense of shared responsibility towards work-related issues and how they affect mental wellbeing:

[CAPs] are generally very open with their innermost thoughts and stuff like that, so it is and I feel like that too, absolutely [...] you are sitting in the same boat [...] we have to have trust in everything we do so [...] I think it is because [...] this safety you have to work up between yourselves anyway and then it's easy to feel secure too at least then privately [open up or confide in CAPs]...however I also think that there is a difference in [...] in my job that I have [...] layovers, you kind of hang out like friends over things like dinners, trips and stuff like that too, if you only run into someone for 45 minutes before and half an hour later after when you're done [with a shift], you may not build the same level of trust.

(FO:39:M)

In contrast to CAPs' confidence in expressing negative emotions to familiar and unfamiliar occupational peers as a result of perceived empathy with work-related issues, the above quotation demonstrates the importance of establishing a consenting bond before sensitive concerns are expressed openly. Specifically, before CAPs are prepared to confide in occupational peers, a sense of identification with professional and or private consequences as a result of disclosing work issues have to be established (e.g., the experience of being grounded as a result of failing medical assessments). As identification with profession- and employee-related concerns and



reprimands increase, CAPs' sense of trust seems to increase and hence confidence in sharing sensitive information:

[It] has to be a very trusted partner and to be honest that's usually another [commercial aviation] pilot because [...] we have a unique language, and if you like, a culture, there's a culture language going on as well, which is almost impenetrable, and in a sense, I suspect that's designed that way, it's part of the shielding process [...] we talk about our stuff [...] you know we live our careers, we do try to get away from it sometimes, but we live our careers [...] people [that] can really understand what [commercial aviation] pilots go through are other [commercial aviation] pilots I think. (CPT:60:M)

Thus, many participants highlight that occupational peers are the only support providers capable of understanding the importance of confidentiality and therefore the only ones entrusted with sensitive concerns normally concealed and dealt with privately. The sense of privacy induced through occupational peerness has contributed to CAPs' experience of OPS as a specific and irreplaceable form of work-related social support (see Table 8 for summary of overarching themes, themes and subthemes including names and definitions).

**Table 8**

*Summary of data analysis (name and definitions of overarching themes, themes and subthemes).*

Outcome of data analysis	Definitions
Overarching themes	
We know what I mean	Represents CAPs' psychologically strong connection gained through OPS between self and occupational peers, which is necessary for CAPs to practically and mentally be able to cope with work-related factors prone to affect mental wellbeing.
Looking for us	Represents vital findings on practical strategies applied by CAPs to access OPS, which is affected by CAPs' experience of the work environment.
Themes	
If I can, you can	Reflects CAPs' professional development through occupational peers and how this supports the psychological strong connection between self and occupational peers gained through OPS, by facilitating CAPs' sense of ability to mentally and practically apply skills to cope with work-related factors affecting mental wellbeing.
We feel...	Captures CAPs' understanding of the work environment and how this supports the psychological strong connection gained through OPS between self and occupational peers, by facilitating CAPs' sense of ability to share mental concerns required to cope with work-related factors affecting mental wellbeing negatively.
How?	Captures OPS strategies created and used by CAPs that are primarily prompted by profession-related factors.
When?	Captures OPSNs created and used by CAPs that are primarily prompted by employer-related factors (the creation and use of strategies described under <i>When?</i> is closely related to <i>How?</i> but differ in terms of CAPs' experience of COs).

Subthemes	
...your needs are my needs!	Intends to demonstrate CAPs' ability to empathise with work-related factors prone to affect mental wellbeing and how this supports occupational peers' understanding of the work environment, by facilitating CAPs' sense of ability to express negative emotions associated with work issues impacting mental wellbeing.
...your concern is my concern!	Aims to show CAPs' ability to identify with work-related factors prone to affect mental wellbeing and how this supports occupational peers' understanding of the work environment, by facilitating CAPs' sense of ability to express concerns associated with work-related factors known to be sensitive and harmful (or most likely harmful) on a mental level.

#### ***4.1.2. Looking for us: Practical strategies applied by commercial aviation pilots to access occupational peer support***

Albeit smaller in magnitude in comparison to *We know what I mean*, the overarching theme *Looking for us* represents vital findings on practical strategies applied by CAPs to access OPS, which is affected by CAPs' experience of the work environment. Participants have referred to several work-related factors that are difficult for non-occupational peers to assist with, which can be divided into two groups if dealt with inappropriately: profession- and or employer-related. For example, one participant has described how rosters assigned by COs can be related to CAP-related fatigue:

I think the hardest part is trying to do [safety] while you're tired and fatigued all the time because, you've probably heard the complaints from [commercial aviation] pilots in this company in that we don't simply get enough time off

between flights, and as I've said you're back, you're flying one way one direction and body clock is wound up one way, and then unwound the other way so, it's the big problem with the job, is the amount of work, there's too much work. (CPT:65:M),

whereas another CAP has described how the work-environment and safety-related assessments as a part of being a CAP can contribute to mental wellbeing issues associated with loneliness:

You do feel incredibly vulnerable and also very very on your own, it's a very solitary occupation I think in many respects, yes you work as a dyadic group in an airline, yes you're working as a team, but nonetheless [...] you [are] demonstrating competency on a daily basis and then proving that every 6 months, so it's your license you are demonstrating, I think it is quite solitary in that prospect. (CPT:61:M)

To cope with profession-related factors (affecting all CAPs) and employer-related factors (influencing a subset of CAPs), CAPs have created multiple forms of occupational peer support networks (OPSNs) to access OPS.

The theme *How?* captures OPS strategies created and used by CAPs that are primarily prompted by profession-related factors. When faced with profession-related factors, CAPs create and use one-to-one and group-based OPSNs delivering OPS in-person and or virtually. Many participants have created or sought one-to-one OPSNs delivering OPS in-person when in need of physical contact to cope with work-related factors affecting mental wellbeing negatively:

It's much better that way [in-person], it's much easier because then you can see each other in person, and the energy when you see in person is way

different than if it were to be over text or by phone or any of that stuff, so it's just like that personal energy that you give each other, as you're talking to another, each other, and looking in each other's eyes, when you're talking about stuff that is intense or just like getting each other a huge after whatever conversation you had, that just helps with the whole being on the same pages, feeling, and so that really helps. (CPT:46:F)

When CAPs are physically separated from each other due to work, CAPs have replaced in-person OPS with one-to-one or group-based OPSNs delivering OPS virtually. Whilst compromising on benefits gained through OPS delivered in-person, OPSNs providing virtual OPS help CAPs to access support quickly and effortlessly when operating in socially constrained environments:

Maybe it's a bit easier to say in text than face-to-face, maybe someone else asks the question before you ask it [...] even if nothing else, it just brings a sense of belongingness to a group, which is not to be underestimated, it's important. (CPT:39:M)

When CAPs are socially constrained, social media platforms and chat groups have been highlighted as leading forums for OPS and OPSNs to build and maintain strong psychological connections between occupational peers:

I have a rather large group of [commercial aviation] pilot girlfriends but no one, none of them lives anywhere close to where I am and this is where social media comes in, social media has been an absolutely invaluable tool to bring, if I really need something, they're just basically a Facebook message or a text message away, social media have really made the world smaller and have made it easier to connect with my social circle, and also it's just you know fast, [name of virtual

group] has done wonders for women in the aviation around the world, it's amazing. (FO:60:F)

The quotation above also shows how CAPs build and maintain bonds with occupational peers on a global level. Findings demonstrate a strong appreciation of OPS received and provided by CAPs employed by different COs and at different hierarchical levels as CAPs with authoritarian connections can be used to influence decisions impacting work processes and the work environment. Moreover, exhibiting and collecting experience from diverse work environments help CAPs to view profession- and employer-related factors through different angles and share a range of coping strategies with occupational peers to support mental wellbeing.

Several participants have also described how OPSNs delivering OPS virtually can help CAPs to access support when information shared can have negative consequences on self if openly disclosed, resulting in the theme *How?* being closely related to the subtheme *...your concern is my concern* (introduced under the overarching theme *We know what I mean*). OPSNs delivering OPS created by or in close proximity to non-occupational peers have shown to impede on CAPs' sense of occupational peers' ability to identify with profession- and employer-related factors and hence the work environment experienced by CAPs, which hampers CAPs' interest in sharing information on work-related factors prone to inflict negative consequences on self and other CAPs. Specifically, CAPs describe an increased need to establish a consenting bond with occupational peers before 'speaking out' when occupational peers can be linked to professional authorities and or employers, especially when there is a history of perceived unfairness or poor treatment by non-occupational peers. In such situations, CAPs tend to create non-authority-related OPSNs only

comprising of occupational peers perceived to be authority- and employer-independent, such as the trade union described below:

We [CAPs] get even closer, get more and more together, the more you see stuff like this happening [contractual disputes with management], that brings us even closer together, we have to stick together, we have a very strong [trade] union where pretty much everyone is a member, so they have managed to get us closer together rather than [separated], and we know they have tried to create conflicts or to divide and conquer, that's what they are aiming for. (FO:37:M)

Thus, occupational peers connected with non-occupational peers in authoritarian positions can have profound effects on CAPs' sense of occupational peerness and therefore confidence in occupational peers' capacity to keep information private and within OPSNs. Confidentiality issues have shown to stir CAPs' trust in non-occupational peers and occupational peers with a connection to authorities (e.g., training CAPs) and ability to disclose sensitive information to OPSNs comprising of connections to authorities. To protect themselves against work-related reprimands, CAPs try to distinguish occupational peers with and without authoritarian connections:

There are some captains that I'm friends with, that I catch up with during my spare time too, and there's definitely a few of them that I feel that I can confide in if I feel something is going on, it's more of a friendship relation, so you have such good knowledge of each other that usually, they know what's going on, but upward the hierarchy I wouldn't go, my closest manager is the base captain, there's nothing wrong with him but I would never ever confide in him. (FO:37:M)

CAPs experiencing confidentiality issues are prone to rely on non-authority-related OPSNs delivering OPS virtually as social media platforms and chat groups allow CAPs

to express concerns and reach OPS without having to involve authorities. Thus, non-authority-related OPSNs delivering OPS virtually give CAPs anonymous access to support with work-related factors affecting mental wellbeing negatively.

The theme *When?* captures OPSNs created and used by CAPs that are primarily prompted by employer-related factors. As such, the creation and use of strategies described under *When?* is closely related to *How?* but differ in terms of CAPs' experience of COs. When faced with employer-related factors, CAPs seek OPSNs delivering OPS formally and or informally. Formal OPS is derived through OPSNs that pre-plan or organise their delivery of OPS to occupational peers:

We [CAPs] have two departments [...] dealing with issues, if you have like a burnout for instance [...] you can go if you have issues, family issues or other problems, alcohol problems and so on, you can go there and get help from most probably [commercial aviation] pilots, or at least [commercial aviation] pilots with a psychological education, and you can talk to them and it stays anonymous, so you don't have to fear some consequences [...] on our way to get [...] captain we have some schooling training with psychological people and we're all co-[commercial aviation] pilots [...] and everybody tells about stressful situations [...] what they did and what happened and so on [...] and that's really helpful because everyone understands you [...] everybody knows what's it all about and everybody can feel it to his position. (FO:35:M)

In contrast, informal OPS can be perceived as unstructured OPSNs providing occupational peers with random conversation which ends up serving as OPS:

I have a good network of other [...] [commercial aviation] pilots in the same workgroup where you go 'hey how did you handle that I would have done this'



or 'I had dealt with this and I did this' or 'I've flown with that person this is what worked for me'. (FO:60:F)

The creation and need of formal and informal OPS seem to reflect CAPs' experience of the work environment. CAPs recognising COs as transparent and open-minded tend to rely on OPSNs delivering a mixture of formal and informal OPS, whereas CAPs sharing a background with COs perceived to be hierarchical demonstrate a very suspicious attitude towards authority-related OPSNs:

I don't think captain first officer makes as big difference [...] I think more of the formal organisational management labels tend to get in their way of sharing personal information, mainly because [commercial aviation] pilots are a very suspicious bunch as you said earlier [...] we are paranoid as well, we worry that somehow that [work issue] will be held against us later at some court of law [...] the trouble is everything we do is written down, everything, and when they say, when an event happens it's extraordinary what they exacerbate, again you look at the Germanwings as a case in point, the sort of paperwork, the detail they went into this guy's background is quite extraordinary, but I understand why the authorities feel the need to do that, but we as [commercial aviation] pilots we understand that, that is the process that is brought at the spotlight, the spotlight that will hit us, if we have an event and it's one of those things we are carrying around as a part of our business. (CPT:61:M)

As such, several CAPs described a certain level of doubt in occupational peers connected to authority-related OPSNs and their capacity to understand when information ought to be confidential to protect CAPs against work-related reprimands

(see Table 8 for summary of overarching themes, themes and subthemes including names and definitions).

## **Chapter 5: Discussion**

With the aim to investigate OPS in relation to employee mental wellbeing, this PhD dissertation set out to explore: 1) the meaning of OPS in occupational high-risk environments; and 2) CAPs' experience of OPS in relation to work-related mental wellbeing to reinforce current knowledge on how peer support can be used to assist CAPs in their coping with work-related factors affecting mental wellbeing negatively (e.g., Bor et al., 2016; Santilhano et al., 2019). Through 26 semi-structured interviews with CAPs employed by major and minor regional and international COs, data extracts have been collected and analysed thematically to answer the following research question: how is OPS experienced by CAPs in relation to work-related mental wellbeing? This resulted in two key findings, demonstrating CAPs' experience of OPS as: 1) a specific and irreplaceable form of social support based on psychologically close working relationships derived through shared first-hand occupational experiences; and 2) a form of social support highly dependent on individual differences and work-related experiences to be perceived as adequate protection against profession- and employer-related factors affecting mental wellbeing negatively. Specifically, the effect of work-related factors on mental wellbeing seems to depend on CAPs' ability to identify with profession- and employer-related factors and having access to OPSNs delivering different types of OPS. This has resulted in multiple forms of OPSNs delivering different types of OPS, including one-to-one and group-based OPSNs delivering formal and informal OPS in-person and or virtually. The different forms and

types of OPSNs and OPS have shown to be used and relied upon to different degrees. When faced with profession- and employer-related factors connected with distrust and lack of transparency, CAPs are more likely to create or seek non-authority-related OPSNs. As such, findings are in line with standing knowledge on CAP wellbeing, suggesting that CAPs are in high need of social support to cope with daily experiences or exposures to profession- and employer-related factors affecting mental wellbeing (Bor et al., 2002; Butcher, 2002; Mjøs, 2004; Moriarty, 2015).

## **5.1. Findings in relation to previous theory and research**

### ***5.1.1. Occupational peer support***

As highlighted by Sarason and Sarason (2009), social support is a complex concept. Current findings show how occupational peerness established through shared first-hand occupational experiences create a psychological unique connection between professionals which is used to encourage professional development and to ensure a genuine work-related understanding. By sharing professional expertise occupational peers can maintain professional growth on a collective level. This includes sharing practical strategies on how to access OPS and gaining knowledge on how to support own and occupational peers' ability to cope with profession- and or employer-related factors affecting or likely to affect mental wellbeing. Occupational peerness has also shown to induce a genuine sense of work-related understanding, making it feasible for occupational peers to empathise and identify with work-related needs and factors. Thus, current descriptions of OPS suggest that occupational peers use occupational peerness to cope with contemporary issues affecting mental

wellbeing and to stay clear of situations that historically have had a negative influence on self and occupational peers.

Previous research can be used to support current findings on occupational peerness. Firstly, research on mental health-related peerness on mental illness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) has shown how shared first-hand experiences of mental illness create a level of understanding that endorses a genuine capacity to support others with mental health issues (Dixon et al., 2010; Forchuk et al., 2016; Gidugu et al., 2015; Mead et al., 2001; Miyamoto & Sono, 2012; Repper et al., 2013; Repper & Carter, 2011; Simoni et al., 2011; Simpson et al., 2014; Walker & Bryant, 2013). Secondly, research exploring employee mental wellbeing has demonstrated a positive relationship between shared first-hand occupational experiences and employees' capability to support own and co-workers sense of mental wellbeing (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019).

The effect of occupational peerness on understanding and capacity to support occupational peers with direct and indirect work-related experiences can be explained by Levitin (2014)'s concept of familiarity with self and others. According to this theory, non-personal experiences are assumed to be understood through external reflections alone, whereas a strong sense of self can be created by exploring internally and externally accumulated information on own conduct. Having access to a larger amount of information on one's conduct is presumed, in turn, to result in one's existence being interpreted as richer and more understandable in comparison to the existence of

others (Levitin, 2014). If this presumption is accepted, shared first-hand experiences should diminish the sense of distance between self and others as the need to gain access to and having to interpret behaviour perceived as foreign or unfamiliar to self decreases through common ground. Further, through the diminished gap between self and others, a psychological connection may be generated that resembles the peerness established between peers (Mead et al., 2001; Simoni et al., 2011), which enhances one's capacity to sincerely comprehend, identify with and support the existence of individuals identified as familiar or likeminded (Levitin, 2014).

The social identity theory (Tajfel, 1970) can also be used to explain occupational peerness and its unique influence on employee mental wellbeing identified within current and previous research (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019). Based on mutually agreed norms and conduct, the social identity theory (Tajfel, 1970) presumes that a powerful feeling of belongingness is created and thereof an inadvertent identification with individuals resembling self. The psychological connection that arises between in-group members is used to influence group members and strengthen already existing sensations of group cohesion (Tajfel, 1970). This can explain participants' ability to use shared first-hand occupational experiences to induce a thorough understanding of the work environment and henceforth get occupational peers' to share profession- and employer-related factors affecting mental wellbeing. With theoretical support on peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) this study points towards the need to break down social support and to properly define the aspect (or

aspects) of social support put under investigation within research (e.g., Burke & Goren, 2014; Cutrona & Russell, 1990; Knox Haly, 2009; Sarason & Sarason, 2009; Siedlecki et al., 2014; Uchino, 2004; Williams et al., 2004) in order to gain an understanding of how social support influences employee mental wellbeing.

It is evident through this study that occupational peerness makes OPS a specific and irreplaceable aspect of work-related social support. Specifically, building on theory (Levitin, 2014; Festinger, 1954, as cited in Simoni et al., 2011; Tajfel, 1970) and empirical findings on peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Mead et al., 2001; Simoni et al., 2011), occupational peerness makes it possible to use indirect speech acts and conversational shortcuts (Levitin, 2014) to rapidly convey an earnest description of the work environment. Without taking considerable risks of being misinterpreted occupational peers can rely on professional knowledge gained through shared first-hand occupational experiences and use this knowledge to omit details or replace time-consuming explanations with mutually agreed abbreviations. The ability to describe the work environment and its influence on mental wellbeing with minimal effort can explain employees' tendency to rate peers with shared first-hand occupational experiences as co-workers exceptionally good at providing support against work-related demands (e.g., Anderson et al., 2020; Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019). Indirect speech acts and conversational shortcuts (Levitin, 2014) can also clarify findings showing participants' inclination to view occupational peers as the only co-workers capable of providing swift and well-fitted support against profession- and employer-related factors affecting mental wellbeing. This seems to include concerns associated with HRO-related safety principles (Lekka, 2011) and their effect on work procedures,

such as skills and medical assessments (Federal Aviation Administration, 2020; DeHoff & Cusick, 2018; Lempereur & Lauri, 2006; Tani, 2010; The European Union Aviation Safety Agency, 2019), SOPs (Civil Aviation Authority, 2015; Bor et al., 2002; de Brito Neto, 2014; Foushee, 1984; Helmreich & Merritt, 1998; Milanovich et al., 1998) and rest restrictions (Haar et al., 2019; Lederer et al., 2018; White et al., 2003).

Whereas indirect speech acts and conversational shortcuts (Levitin, 2014) can justify employees' tendency to quickly build reliable support networks with occupational peers (e.g., Anderson et al., 2020; Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019), the social identity theory (Tajfel, 1970) can be aligned with findings on professional identification (Ashforth & Mael, 1989; Turner & Knight, 2015) suggesting that occupational peers sense stronger work-related belongingness and hence support from co-workers with shared professional norms, values and beliefs. For example, physicians trained within the same professional vocation have shown to use professional awareness to support physicians with mental health-related issues (e.g., Beales & Wilson, 2015; Forchuk et al., 2016; Hardy et al., 2019; Puschner, 2018), including negative experiences of being a second victim (Calder-Sprackman et al., 2018; Dukhanin et al., 2018; Johnson et al., 2019; Merandi et al., 2017; Plews-Ogan et al., 2016). Similarly, in addition to theory (Bor et al., 2016; Kanki et al., 2010; Mitchell & Leonhardt, 2010) and previous research on CAP-related peer support (Bor et al., 2016; Creamer et al., 2012; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981; Mulder & de Rooy, 2018; Ross & Ross, 1995; Santilhano et al., 2019), current findings on OPS seem to agree with professional identification and capacity to support co-workers through work-related factors with negative effects on

wellbeing (e.g., Curtis & Eby, 2010; Devery et al., 2018; Edwards & Durette, 2010; Mühlhaus & Bouwmeester, 2016).

Finally, participants' view of OPS as a form of work-related social support that brings unique opportunities for personal growth can be compared with the social comparison theory (Festinger, 1954, as cited in Simoni et al., 2011) suggesting that individuals determine their worthiness by comparing self with others. As such, by seeking information from occupational peers to evaluate 'correctness' of behaviour, CAPs can use each other to determine need for development and growth as professionals. As an example, CAPs judged to be lower in rank could be leveraged on to increase self-esteem (i.e., self-enhancement) whereas occupational peers viewed as superior to self can help to inspire or prompt an urge for personal development (i.e., self-improvement) (Festinger, 1954, as cited in Simoni et al., 2011). Thus, contemporary theory on peer support based on peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Mead et al., 2001; Simoni et al., 2011) and research on peer support in association with employee (e.g., Anderson et al., 2020; Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019) and non-employee mental wellbeing (Dixon et al., 2010; Forchuk et al., 2016; Gidugu et al., 2015; Mead et al., 2001; Miyamoto & Sono, 2012; Repper et al., 2013; Repper & Carter, 2011; Simoni et al., 2011; Simpson et al., 2014; Walker & Bryant, 2013) support current findings on OPS, suggesting that peer support underpinned by occupational peerness is a specific and irreplaceable form of work-related social support that contributes to professional growth and a unique sense of understanding of how the work environment can influence mental wellbeing.



### **5.1.2. Occupational peer support networks**

To understand employee mental wellbeing, employers need to recognise OPS and assess its contribution to health. By viewing OPS as a specific and irreplaceable form of social support highly dependent on individual differences and work-related experiences to be perceived as adequate protection against profession- and employer-related factors affecting mental wellbeing negatively, participants have suggested that the influence of OPS on mental wellbeing depends on individual characteristics and interpretations of the work environment. For example, participants enforced to work in highly flexible and physically dispersed teams have highlighted a need for OPSNs delivering OPS virtually. Similarly, female participants struggling with gender-related issues at work have expressed a strong reliance on OPSNs consisting of female occupational peers only. Thus, as shown through the ILR exploring empirical findings on peer support in occupational high-risk environments and its relationship with employee wellbeing, employees' cultural experience and perception of the work environment seem to affect one's sense of match between perceived and received OPS (Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Guest et al., 2011; Howerton Child & Sussman, 2017; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019) and therefore occupational peer supporters' capacity to provide adequate support (Gottlieb & Bergen, 2010).

Participants disclosure of multiple OPSNs (i.e., in-person, virtual, formal, informal, one-to-one and or group-based) confirm theory on structural aspects of social support, suggesting that several direct and indirect social connections surrounding an individual influence one's sense of wellbeing (Gottlieb & Bergen, 2010;

Hinson Langford et al., 1997; Uchino, 2004). Theory on functional aspects of social support and wellbeing (Gottlieb & Bergen, 2010; Uchino, 2004) can also be associated with current findings as four previously identified and commonly explored functional types of social support (Gottlieb & Bergen, 2010; Hinson Langford et al., 1997) can be discernible within participants' description of OPS. Specifically, participants' descriptions of resources leading to professional growth and work-related understanding as a result of OPS resemble contemporary descriptions of emotional, instrumental, informational and appraisal support connected with mental wellbeing (Hinson Langford et al., 1997) (see Table 9).

**Table 9**

*Functional aspects of social support and descriptions*

Aspect	Description
Emotional	Care, empathy, love and trust
Instrumental	Tangible material aid
Informational	Advice and guidance for problem-solving
Appraisal	Feedback for self-evaluation

Participants' reliance on different types of OPS to cope with work-related factors agree with findings revealed through the ILR, suggesting that employees operating within high-risk environments connect peer support associated with occupational peeriness with a range of resources influencing mental wellbeing positively. This includes connection with others (Adams et al., 2015; Anderson et al., 2020; Howerton Child & Sussman, 2017; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019), emotional comfort

(Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Howerton Child & Sussman, 2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019) and knowledge exchange for personal growth (Anderson et al., 2020; Cawkill, 2004; Hsieh et al., 2016; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019). The range of resources described in relation to occupational peerness could be associated with different experiences and perceptions of culture or the work environment. As such, previous research on peer support associated with occupational peerness and current findings on OPS seems to agree with the matching hypothesis (Cohen & Wills, 1985), suggesting a need for congruence between individual needs and support efforts for OPS to have a positive influence on employee mental wellbeing.

The presumed effect of match between form of OPSN (or type of OPS) and individual needs on employee mental wellbeing has gained further support in a study on social exchanges and work-related strain (Nahum-Shani & Bamberger, 2011). In this study, social support helped to decrease perceived strain when support given was equal (i.e., reciprocal) or less than received (i.e., over-reciprocating), whereas a positive but lower effect of support on strain was detected when support given exceeded support received (i.e., under-reciprocating) (Nahum-Shani & Bamberger, 2011). The difference in capacity to buffer against strain suggests that employees benefit from social support networks that match individual needs. The theory on match between perceived and received social support (Cohen & Wills, 1985; Gottlieb & Bergen, 2010; Hinson Langford et al., 1997) has gained further support in a longitudinal study wherein emotional support had a positive influence on perceived

strain but only when employees showed a distinct need for this type of support (van de Ven et al., 2013). Similarly, Langjordet Johnsen et al. (2018) have been able to reveal higher job satisfaction and lower subjective health complaints when support providers showed respect for support receivers' feelings, thoughts and choices instead of presuming responsibility and providing guidance on how to respond to work issues.

Findings on match between perceived and received social support (e.g., Cohen & Wills, 1985; Langjordet Johnsen et al., 2018; Nahum-Shani & Bamberger, 2011; van de Ven et al., 2013) indicate that employers keen to align with employees' envisions on social support are more likely to see a positive influence of OPS on employee mental wellbeing. That is, for OPS to act as a protection against mental health deterioration, OPSNs need to be perceived by occupational peers as accessible and capable of providing a type of OPS that matches individual conceptions of adequate support. Thus, for findings to support traditional theories on work-related social support and employee wellbeing such as the Job Demand-Control-Support (JDCS) model by Johnson and Hall (1988), OPS need to fit personal reactions to culture or the work environment. Employers have to ensure that support providers share support receivers' views on what constitutes adequate work-related support. This includes finding an agreement between support receivers' interpretation of accessible support (i.e., perceived support) and type of support actually received by providers (i.e., received support) (Gottlieb & Bergen, 2010). If the relationship between perceived and received support is ignored, social support can be considered unwanted and intrusive and add to already existing levels of work-related strain (e.g., Burke & Goren, 2014; Cutrona & Russell, 1990; Langjordet Johnsen et al., 2018; Uchino, 2004; van de Ven et al., 2013). As a result, blind adherence to traditional presumptions on work-related

social support and employee wellbeing (e.g., the JDCS model by Johnson & Hall, 1988) can be one of the biggest threats to organisational welfare, especially within occupational high-risk environments where substandard errors caused by poor mental health can lead to critical incidents with far-reaching human and financial costs (Gunia et al., 2015; Mitchell & Leonhardt, 2010). Consequently, to ensure that OPS buffers against work-related strain employers need to understand when OPS influences employee mental wellbeing, which is only achievable by considering individual differences and experiences of profession- and employer-related factors. Moreover, the varying degree of mental wellbeing evoked by different forms of OPSNs and or types of OPS suggest that employers have to be prepared to apply knowledge on individual differences and experiences to create (or support) social networks that are perceived as viable by employees. Based on current findings, this is likely to include multiple OPSNs capable of delivering several types of OPS, including practical and mental aspects that meet CAPs' developmental and psychological needs to cope with work issues.

To support a more flexible view of OPSNs and OPS within HROs and high-risk environments, employers could explore and introduce peer support models already developed and used to support the mental health of individuals sharing first-hand experiences of mental illness (Forchuk et al., 2016). These are models ranging from naturally occurring conversations with friends to pre-planned programs delivered by paid peer supporters in clinical settings (Forchuk et al., 2016; Fortuna et al., 2019; Repper et al., 2013; Repper & Carter, 2011) (see Table 10), which resemble participants' descriptions of OPSNs and types of OPS required to cope with work-related issues. The direct and indirect peer support models identified by Forchuk et al.

(2016) are therefore likely to assist COs in establishing OPSNs that will be used by CAPs to cope with work-related issues affecting mental wellbeing.

**Table 10**

*A spectrum of peer support models*

**Friendship**



**Informal Peer Support**

- Naturally occurring, voluntary, reciprocal relationships with peers, one-on-one or possibly in a community.

**Clubhouse/Walk-in Centre**

- Mainly psychosocial and social recreational focus with peer support naturally occurring among participants.

**Self-Help, Mutual Peer Support**

- Consumer-operated/run organization and activities, voluntary, naturally occurring, reciprocal relationships with peers in community settings.

**Formalised/Intentional Peer Support**

- Consumer-run peer support services within community settings, group or one-on-one, focusing on issues such as education, employment, MH systems navigation, systemic/ individual advocacy, housing, food security, Internet, transportation, recovery education, anti-discrimination work, etc.

**Workplace Peer Support**

- Workplace-based programs where employees with lived experience are selected and prepared to provide peer support to other employees within their workplace.

**Community Clinical Setting Peer Support**

- Peer supporters selected to provide support to patients/clients that utilise clinical services, e.g., outpatient, ACT teams, case management, counselling Clinical/Conventional MH System-Based Peer Support – clinical setting, inpatient/outpatient, institutional peer support, multidisciplinary groups, recovery centres, or rehabilitation centre crisis response, crisis management, emergency rooms, acute wards.

**Clinical/Conventional MH System-Based Peer Support**

- Clinical setting, inpatient/outpatient, institutional peer support, multidisciplinary groups, recovery centres, or rehabilitation centre crisis response, crisis management, emergency rooms, acute wards.

**Clinical Care**

*Note.* Adapted from “Peer support”, by C. Forchuk, M. Solomon and T. Virani, 2016, *Healthcare Quarterly*, 18, p.32.

Within HROs, employees' need for OPSNs capable of ensuring confidentiality can clash with employers' obligation to implement and enforce safety-related principles, such as keeping training and medical records to anticipate problems and inspire continuous learning (Lekka, 2011). As identified through current findings, participants try to avoid reprimands associated with having profession- and employer-related factors shared with non-peers or occupational peers connected to authorities. To achieve this mission, participants are prone to conceal sensitive information and support needs from authorities whilst actively seeking OPS from non-authority-related OPSNs. For several participants, this has resulted in a need for OPSNs unconnected to management to feel safe enough to share sensitive information and seek support against work-related factors affecting mental wellbeing negatively.

A potential explanation to participants' hesitation to share sensitive information within authority-related OPSNs is non-occupational peers' unawareness or ignorance of how confidentiality influences trust (Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019). As shown through this study, when non-occupational peers officially connected to management get involved and start to formalise OPS, occupational peers describe a feeling of having to communicate explicitly to attain non-occupational peers' understanding of the work environment. Information generally omitted through indirect speech acts or conversational shortcuts (Levitin, 2014) is suddenly exposed. Moreover, work-related details have to be shared with non-occupational peers without a guarantee of being interpreted correctly, which increases unwarranted consequences if non-safety-related information is misinterpreted as harmful and therefore shared with management.



Managerial misconduct of information gained through OPSNs and or non-occupational peers' ability to misinterpret professional insight can lead to a strong dependence on non-authority-related OPSNs. According to the social identity theory (Festinger, 1954, as cited in Simoni et al., 2011), occupational peers identifying with managerial principles and needs can challenge in-group members' view of mutually agreed norms and conduct. Too strong oppositions can threaten the psychological connection holding group members together (Tajfel, 1970) and have a negative effect on occupational peers' sense of occupational peerness (Beales & Wilson, 2015; King & Simmons, 2018; Lawton-Smith, 2013; Simoni et al., 2011; Walker & Bryant, 2013; Winslow et al., 2019) and professional identification (Ashforth & Mael, 1989; Turner & Knight, 2015). When group members' sense of shared first-hand occupational experiences and profession-related norms, values and beliefs are overrun by non-shared experiences, the group is likely to be split into distinctive in-groups such as occupational peers connected or unconnected with authorities. Ultimately, a form of authority-related OPSN can evolve that loses its status as a non-authority-related OPSN capable of providing a sincere sense of confidentiality. Participants' tendency to rely on OPS delivered by occupational peers unconnected to authorities can therefore be accounted for non-occupational peers' influence on OPS, which include a limited capacity to understanding the work environment and therefore knowledge on when profession- and employer-related factors ought to be confidential. Employers compelled to only support occupational peers officially connected to or selected by management are therefore likely to impede on employee-related benefits generally associated with peer support (e.g., Anderson et al., 2020; Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019).

In addition to understanding privacy, discretion appears to play a vital role in gaining employees' approval of peer support programs initiated by authorities (Bor et al., 2016; Cawkill, 2004; Dowling et al., 2006; Hu et al., 2012; Ross & Ross, 1995; Santilhano et al., 2019). With numerous internet-based social support networks created and operated exclusively by CAPs for CAPs to be anonymous (e.g., PPRuNe, n.d.), confidentiality has shown to be of particular importance within the CAI. That is, CAPs seeking to discuss sensitive information openly without risking reprimands seem to have shifted their attention towards virtual OPSNs that are capable of ensuring and respecting anonymity. This reflects findings on OPS and confidentiality implying that employees' confidence in authority-instigated peer support initiatives depends on employers' intention to treat private information as private (Cawkill, 2004; Dowling et al., 2006; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019). Specifically, organisational needs restraining confidentiality agreements and processes designed to support employee mental wellbeing can cause doubt in authority-related OPSNs and forfeit the purpose of introducing OPSNs. This suggests that dismissing employees' views on how to interpret and manage profession-related information can result in employers' being perceived as insensitive and primarily driven by managerial agendas (Cawkill, 2004; Dowling et al., 2006; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019). This, in turn, can explain participants' reliance on multiple forms of OPSNs to cope with work-related factors affecting mental wellbeing and mixed views on authority-initiated peer support initiatives such as CISM (Mitchell & Leonhardt, 2010) and TRiM (Greenberg et al., 2010) programs.

In contrast, employers showing an interest in understanding how support interventions can conflict with safety-related obligations seem to be better at attaining

employees' approval of authority-related OPSNs (Bor et al., 2016; Creamer et al., 2012; Greenberg et al., 2010; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981). A high level of interest could mean involving employees in early discussions on how to introduce and look after procedures and regulations (Cawkill, 2004; Dowling et al., 2006; Hu et al., 2012; Pinto et al., 2013; Santilhano et al., 2019), such as the implementation and maintenance of Lekka (2011) five safety-related principles associated with HROs. Translated into the CAI, CAPs would be less likely to perceive safety-related principles as reprimands if COs openly show how regulations are put in place to satisfy both organisational and employee needs. As such, the success of CAP-related peer support programs (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Creamer et al., 2012; Greenberg et al., 2010; Kanki et al., 2010; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981) may hang on COs' interest in sharing how information on profession- and employer-related factors will be interpreted, treated and transformed into policies. This could include knowledge gained through CAPs on SOPs (Bor et al., 2016; Federal Aviation Administration, 2017) and rest regulations (The National Archives and Records Administration and The United States Government Publishing Office, n.d.c.) and their effects on mental wellbeing.

Exploring positive outcomes of peer support programmes underpinned by mental health-related peeriness (e.g., Beales & Wilson, 2015; Gidugu et al., 2015; King & Simmons, 2018; Lawton-Smith, 2013; Simoni et al., 2011; Walker & Bryant, 2013), employees' approval of authority-related OPS may also be achieved by conducting regular program evaluations and adhering to formal selection, training and accreditation processes involving peer supporters. However, employers operating

within hierarchical cultures should be conscious of not proposing and enforcing procedures that impede on employees' autonomy to socialise with co-workers, as involuntary structures on how and when to build relations would threaten employees' capacity to build relations based on peerness and therefore risking the core principle of peer support (Beales & Wilson, 2015; King & Simmons, 2018; Lawton-Smith, 2013; Simoni et al., 2011; Walker & Bryant, 2013; Winslow et al., 2019). Processes put in place to support and maintain a healthy workforce should be of the highest priority, regardless of culture and business objectives.

As indicated through this study, cultures and work environments that encourage transparency *and* participation in decision-making processes entailing OPS increase employees' willingness to seek support from authority-related OPSNs and use these networks to supply organisations with safety-related information. Thus, by providing OPSNs that are appreciated by employees, employers increase their potential to attain information that can be used to support work-related wellbeing. Within the CAI, this can entail access to supplemental knowledge on how profession- and employer-related factors connect with safety-related principles (Lekka, 2011) and challenges previously mentioned within CAP-related research (e.g., Civil Aviation Authority, 2015; Bor, 2007; Bor et al., 2002, 2016; Bor & Hubbard, 2006; Bourgeon et al., 2013; de Brito Neto, 2014; Foushee, 1984; Helmreich & Merritt, 1998; Kanki et al., 2010; Lempereur & Lauri, 2006; Milanovich et al., 1998; Mitchell & Leonhardt, 2010; Mjøs, 2004; Moriarty, 2015; National Transportation Safety Board, 1990, 1997; Tani, 2010).

Finally, employer-related factors cannot solely account for occupational peers' dependence on multiple forms of OPSNs. As demonstrated through this study,

profession-related factors unconnected to employers can also induce a need for OPS. This include stigma provoked by general perceptions of employees operating within HROs and high-risk environments (Cawkill, 2004; Hu et al., 2012). For example, physicians operating in medical high-risk environments have shown to hide emotions and support needs from non-professionals when discernible signs of vulnerability cause negative reflections on physicians' ability to cope with work-related pressures (Hu et al., 2012). Thus, occupational peers' need for social support beyond OPSNs seems to falter when general perceptions on one's capacity to cope with work induce negative effects on mental wellbeing. Consequently, to gain employees' trust in authority-related OPSNs employers have to be transparent with long-term consequences of sharing information deemed as safety-sensitive and level of work-related social support available to cope with work-related factors affecting mental wellbeing negatively. In addition, to protect employees from profession-related factors affecting mental wellbeing, employers need to support non-authority-related OPSNs or at least accept employees' need for multiple forms of OPSNs delivering different types of OPS to cope with work-related factors affecting mental wellbeing.

## **5.2. Research contributions**

This study has reached its aim and objectives by providing an empirical understanding of OPS in occupational high-risk environments and CAPs' experience of OPS in relation to work-related mental wellbeing. Specifically, through novel knowledge on how multiple forms of OPSNs delivering different types of OPS can influence the mental wellbeing of CAPs, this study can be used to verify theory suggesting that peer support is a specific form of social support underpinned by

peerness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) and research connecting peer support underpinned by occupational peerness with increased employee mental wellbeing in high-risk environments (e.g., Adams et al., 2015; Anderson et al., 2020; Brasher et al., 2010; Dowling et al., 2006; Guest et al., 2011; Howerton Child & Sussman, 2017; Hu et al., 2012; Merandi et al., 2017; Pinto et al., 2013; Santilhano et al., 2019). On a theoretical level, findings contribute to contemporary knowledge by showing the importance of considering peerness to understand the relationship between peer support and employee mental wellbeing. By identifying OPS as a specific and irreplaceable form of social support based on psychologically close working relationships derived through shared first-hand occupational experiences (i.e., occupational peerness), this study has helped to unravel the conceptual complex relationship identified between social support and wellbeing (Barrera, 2000; Beales & Wilson, 2015; Cutrona & Russell, 1990; Forchuk et al., 2016; Mead et al., 2001; Repper et al., 2013; Sarason & Sarason, 2009; Thoits, 2011; Uchino, 2004). To verify contemporary knowledge and continue the exploration of OPS, findings can be used to develop research on OPS comprising of a larger number of participants operating within and beyond HROs and high-risk environments. Structured interviews and or surveys developed through this study could, for example, be used to collect pools of quantitative data that help to validate and generalise findings across a broader range of occupational settings (Bryman, 2012). This study can therefore also be used to trigger further research on OPS, or other structural forms and functional types of social support (Gottlieb & Bergen, 2010; Uchino, 2004), on employee wellbeing.

On a practical level, this is to the author's knowledge the first study that highlights the importance of acknowledging employees' individual differences and work-related experiences to understand the relationship between OPS and employee mental wellbeing, which is findings that can be used to prompt organisations to modify existing business strategies aimed at supporting employee wellbeing or to establish OPSNs that allow for individual differences and needs. Specifically, findings can add to occupational practice by providing employers with empirical information on how to implement OPS to facilitate employee mental wellbeing within HROs and high-risk environments (or unconventional settings resembling the work environment identified by CAPs). This entails a need to explore individual differences and work-related experiences to establish how employees perceive work-related factors and their needs to cope with the work environment. Findings highlight the importance of acknowledging every employee and his or her experience of the work environment to fully understand the relationship between OPS and employee mental wellbeing. Thus, through this study, it is evident that employers' interest in building an awareness of how and when the work environment creates work-related factors that require OPS is a prerequisite to support employees with work-related factors affecting mental wellbeing. Employers forgetting or avoiding to genuinely invite employees to share work-related experiences run the risk of implementing OPSNs on poor premises, which increases the risk of gaining outcomes that contradicts common predictions on social support and work-related strain often related to traditional occupational stress models such as the JDCS model by Johnson and Hall (1988).

Translated into the CAI specifically, this study can be used to encourage COs to evolve safety-related policies encompassing OPS-related procedures or to create

OPSNs delivering OPS that are in line with CAPs' need of work-related social support. By adding insight on CAPs' use of both non-authority- and authority-related OPSNs to cope with work-related factors affecting mental wellbeing, this study supports contemporary research suggesting positive relationships between CAP-related peer support and mental health (e.g., Bor et al., 2016; Mitchell & Leonhardt, 2010; Santilhano et al., 2019). Moreover, by verifying a need for both formal and informal work-related social support networks to ensure employee mental wellbeing (Winslow et al., 2019) current findings can be used to support COs' provision of multiple forms of OPSNs delivering OPS that suit CAPs' needs of work-related social support. This could be achieved by incorporating recommendations on OPS within existing policies on peer support. For example, CRM programs and social support networks aimed at recognising and supporting CAPs with health concerns (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Greenberg et al., 2010; Kanki et al., 2010; Mitchell & Leonhardt, 2010; Mitchell & Resnik, 1981; Ross & Ross, 1995; Santilhano et al., 2019) can be analysed and, if required, modified to meet needs on an individual basis.

Alternatively, with findings suggesting that individual differences and work-related experiences affect the influence of OPS on employee mental wellbeing, COs could use this study to instigate an exchange of information with employees and competitors on match between OPSNs and support needs. CAPs' sense of liberty in choosing where, when and whom to connect with will only increase when COs are able to see the value of sharing responsibilities and knowledge on how to support OPSNs that fit CAPs' needs. Moreover, with respect to confidentiality, transparency will help COs to save investments as OPSNs already shown to meet CAPs' experience of work-



related factors can be introduced and modified to meet individual needs. This can include reliance on OPSNs created beyond own regimes, such as trade unions and independent CAP-related associations. The result of sharing successes and failures on efforts to support CAP-related wellbeing can entail the development of and trust in global OPSNs appreciated by CAPs (which is supported by current findings highlighting cooperation as a major factor for OPS to successfully help organisations with employee wellbeing).

Another use of this study would be the introduction of OPSNs for second victims specifically. With positive health outcomes of physician-related peer support on second victims (e.g., Coughlan et al., 2017; Wu, 2000) and current findings on OPS and OPSNs, COs would increase their potential to shield crews and customers against CAP-related critical incidents (Gunia et al., 2015; Mitchell & Leonhardt, 2010) by investigating the existence of second victims and how OPSNs can support second victim-related mental health issues. If CAPs experiencing or fearing to experience second victim health-related issues are given access to multiple OPSNs delivering different types of OPS to cope with work, COs would be better at protecting the public view of commercial aviation as a safe enterprise. As such, current and previous findings on relationships between structural and functional aspects of social support and wellbeing (e.g., Cohen & Wills, 1985; Gottlieb & Bergen, 2010; Langjordet Johnsen et al., 2018; Nahum-Shani & Bamberger, 2011; Uchino, 2004; van de Ven et al., 2013) can be leveraged on to create and enable access to OPSNs that are considered useful by its end-users.

In sum, this study has contributed with an empirical understanding of OPS and research evidence that can be used to support previously identified relationships

between occupational-related peer support and CAP wellbeing (Bor et al., 2016; Santilhano et al., 2019), which is a vital achievement to decrease the risk of critical incidents associated with CAP-related mental health (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Kanki et al., 2010; Mitchell & Leonhardt, 2010). This study can also be used as a reason to continue the exploration of social support and its relationship with wellbeing, including OPS and how this specific and irreplaceable form of work-related social support may be used as an occupational strategy to increase or improve attempts aimed at sustaining a safer and healthier workforce.

### **5.3. Study strengths and limitations**

Research contributions are connected with certain study strengths and limitations. First and foremost, by using theory and research conducted on peer support and wellbeing (e.g., Calder-Sprackman et al., 2018; Daniels et al., 2017; Dodge et al., 2012; Dukhanin et al., 2018; Gillard et al., 2014; Johnson et al., 2019; King & Simmons, 2018; Mead et al., 2001; Merandi et al., 2017; Plews-Ogan et al., 2016; Simoni et al., 2011) to define and explore OPS as a concept on its own, this study has followed recommendations on establishing and adhering to operational definitions that are workable and internationally applicable (Jacobson et al., 2012; Simoni et al., 2011). The decision to work against “definitional ambiguity” (Knox Haly, 2009, p. 56) helps researchers to discern current findings from previous outcomes on work-related social support wherein terms such as *co-worker*, *colleague* and *peer* have been interchangeably used, undefined or vaguely described (e.g., Chiaburu & Harrison, 2008; García-Herrero et al., 2013a; García-Herrero et al., 2013b; Isaksson Rø et al.,

2016; Langjordet Johnsen et al., 2018; Luchman & González-Morales, 2013; Ng & Sorensen, 2008; Nieuwenhuijsen et al., 2010). As a result, current findings can be used to gain a more reliable view of how OPS relate to employee mental wellbeing.

Another strength of this study is the research approach selected. In contrast to the ten quantitatively conducted studies on OPS and employee wellbeing (Brasher et al., 2010; Cawkill, 2004; Dowling et al., 2006; Greenberg et al., 2010; Guest et al., 2011; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Ryu et al., 2020), this study has explored OPS and its relationship with employee mental wellbeing through the subjectivist approach to social science. This approach was adopted as it recognises participants' subjective meanings of OPS and uses this insight to explain how OPS relate to employee mental wellbeing (Braun & Clarke, 2013; Creswell, 2008). By avoiding deductive approaches often based on surveys consisting of primarily forced-choice questions (Bryman, 2012), participants have been able to express needs, views and visions of OPS openly without being framed by factors externally assumed to impact OPS and its influence on employee mental wellbeing. On the contrary, by conducting semi-structured interviews until theoretical saturation, participants' unique perspectives of OPS and how it influences mental wellbeing has been retained as far as possible (Braun & Clarke, 2006, 2013; Bryman, 2012; Burrell & Morgan, 1979; Robson, 2002; Willig, 2008).

Although, potential effects of researcher bias on findings (Robson, 2002) have to be acknowledged. With widely accepted relationships between job demands, job resources and employee wellbeing (e.g., Bakker & Demerouti, 2017; Gilbert-Ouimet et al., 2014; Luchman & González-Morales, 2013; Nielsena et al., 2017; Tang, 2014; van der Doef & Maes, 1998, 1999) derived through deductive research on the JDC model

and revised versions of it (Bakker & Demerouti, 2007; Johnson & Hall, 1988; Karasek, 1979), it has been a challenge to set aside previously known relationships between social support and employee wellbeing. A positivistic researcher background increased the difficulty of analysing dubious or undecided responses made by participants and to present data in line with assumptions underlying inductive research methods. To decrease the effect of researcher bias on participants' conceptual understanding of OPS, progress and planned directions were logged regularly throughout the conduct of this study. This enabled tracing of thought and ideas and how these evolved during the study (Robson, 2002) which, in turn, led to data analysis and outcomes being reviewed and revised on an ongoing basis against the research question and previous theories and research on peer support and wellbeing (see Appendix C for an illustration on how data analysis evolved over time).

To avoid respondent bias and researcher reactivity commonly associated with qualitative research (Robson, 2002), study aim and objectives were underlined at the beginning of every interview and participants were probed carefully (especially individuals sharing negative experiences of discussing wellbeing with health professionals). As shown through research and current findings, the CAI is known to be very hierarchical (Civil Aviation Authority, 2015; Bor et al., 2002, 2016; Bor & Hubbard, 2006; de Brito Neto, 2014; Foushee, 1984; Helmreich & Merritt, 1998; Milanovich et al., 1998) and male-dominant (McCarthy et al., 2015). As such, only CAPs ready to discuss work-related issues with a non-CAP female researcher holding postgraduate training in occupational psychology may have felt comfortable enough to take part in this study or been able to express details on work-related social support and mental wellbeing during the interview. Similarly, researcher reactivity was a

potential issue when participants were inclined to view participation in the study as an opportunity to vent and obtain professional support on how to cope with work-related factors affecting mental wellbeing. When interviewing female CAPs, for example, the researcher-participant relationship had to be carefully monitored as verbal and non-verbal expressions on participants' responses to interview questions and probes could result in the researcher being viewed as a professional counsellor or peer based on shared first-hand experiences of working in a very male-dominated environment. Participants seeming to seek professional support were gently reminded of the purpose of the study and once again given contact details for further support if required (initially provided through the participant information sheet prior to interviews).

Despite certain methodological limitations, this study has gone some way towards enhancing our understanding of OPS. From a subjectivistic stance, it is generally accepted that the value of conducting research relies on trustworthiness and transferability, which is associated with the level of data collected for analysis (Braun & Clarke, 2013; Bryman, 2012). By striving to collect rich accounts of CAPs' experience of OPS in relation to work-related mental wellbeing it has been possible to produce a thick description of the meaning of OPS in occupational high-risk environments and CAPs' experience of OPS in relation to work-related mental wellbeing. Current findings should therefore be applicable within HROs and most likely organisations operating in high-risk environments that are struggling with employee mental wellbeing or employers sharing similar concerns with employees in settings that are reflective of CAPs' work environment, such as institutions providing medical and surgical treatments (Anderson et al., 2020; Guest et al., 2011; Howerton Child & Sussman,

2017; Hsieh et al., 2016; Hu et al., 2012; Kogien & Cedaro, 2014; Merandi et al., 2017; Pinto et al., 2013).

Third and finally, participants were recruited on a global level across major and minor regional and international COs, which has assisted in capturing a universal understanding of CAPs' experience of OPS. Moreover, by collecting a range of demographical data on participants it is possible to discern potential forms of peernesses that can have interacted or influenced the relationship identified between OPS and employee mental wellbeing. Findings suggesting, for example, that female CAPs opting for OPS from OPSNs consisting of female occupational peers only could be explained by a need for peer support underpinned by gender-related peerness (in this case being a female) (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011). Alternatively, as shown through this study on peerness, shared first-hand experiences of being a female is likely to add to female CAPs' sense of psychological connection with CAPs, making OPSNs consisting of female CAPs only a more attractive OPSN when trying to cope with gender-related work issues affecting mental wellbeing. Whereas access to data on nationality, age, gender and seniority level can help to interpret findings, this study would have benefitted from data on national and organisational culture. With a cockpit environment dominated by males (McCarthy et al., 2015) and research implying a higher preference for male managers (Powell & Butterfield, 2015), participants' description of the work environment and how it interacts with cultural traditions could have added insight on female CAPs' need of OPSNs consisting of females only and the appropriateness of transferring findings across COs (Braun & Clarke, 2013; Bryman, 2012). It should also be noted that findings rely on data collected before March 2018. Several accidents and incidents involving

commercial aircrafts have happened since then (Wikipedia, n.d.), which may have altered CAPs' perception of OPS and its relationship with employee mental wellbeing. Although, with peer support growing as a remedy against mental ill-health (e.g., Fortuna et al., 2019; Santilhano et al., 2019; Schrøder et al., 2022; White & Delacroix, 2020), findings revealed through this study will most likely reflect employees' interpretation of peer support today. For example, the importance of OPS to sense a psychologically strong connection between self and occupational peers to practically and mentally be able to cope with work-related factors prone to affect mental wellbeing.

#### **5.4. Future research suggestions**

Whilst empirically supporting theory and research on OPS within the CAI (e.g., Bor et al., 2016; Mitchell & Leonhardt, 2010; Santilhano et al., 2019) and adding valuable insight on OPS within HROs, this study does not present a conclusive picture on where we stand today in terms of OPS and its relationship with employee mental wellbeing. To gain a better understanding of how OPS differ from other structural and functional aspects of social support (Gottlieb & Bergen, 2010; Uchino, 2004), participants could have been invited to share insight on themes created to reflect CAPs' experience of OPS in relation to work-related mental wellbeing (Braun & Clarke, 2013; Robson, 2002). A second option would be to conduct this study through another or a combination of research methods. For example, focus groups or observations of CAPs at work alongside semi-structured interviews could add valuable insight on OPS (Braun & Clarke, 2013; Bryman, 2012; Robson, 2002). Also, since current findings strongly reflect CAPs' subjective perception of OPS, there is a benefit in replicating this

study with professionals operating within HROs, high-risk and non-high-risk environments. This could involve inductive, deductive and mixed-method studies, as findings based on a larger number of participants and a combination of methodological approaches would help to verify, transfer and build on current knowledge on OPS. Specifically, by taking advantage of methodological benefits associated with both inductive and deductive research, it will be possible to gain a better understanding of how OPS relate to employee mental wellbeing within and beyond HROs and organisations operating in unconventional environments (Braun & Clarke, 2013; Robson, 2002).

In addition to the abovementioned suggestions for further research, two recommendations are made to evolve current knowledge on OPS. Firstly, it would be worthwhile to explore multiple forms of peernesses to gain a better understanding of how individual differences interact with the relationship identified between OPS and employee mental wellbeing. For example, future research could explore female CAPs' preference for OPS delivered by OPSNs consisting of female CAPs only. Similarly, research could be conducted on shared first-hand experiences associated with seniority level and its influence on same-ranked CAPs' need of OPS. Research could also take a closer look at work-related factors eliciting CAPs' search for OPS and different forms of peernesses, as current findings suggest that individual differences and work experiences can influence CAPs' perception of profession- and employer-related factors affecting mental wellbeing. For example, CAPs with positive experiences of different forms of peernesses and access to a wide range of OPSNs could be better skilled at coping with work-related factors previously associated with CAP-related mental wellbeing, such as the cockpit environment (Bourgeon et al., 2013;



Butcher, 2002; Federal Aviation Administration, 2017, 2020; The European Union Aviation Safety Agency, 2019), financial business objectives (Bor et al., 2002; Butcher, 2002; Civil Aviation Authority, 2014, 2015; de Brito Neto, 2014; DeHoff & Cusick, 2018; Fanjoy et al., 2010; Foushee, 1984; Helmreich & Merritt, 1998; Hummels, 1997; Marais & Robichaud, 2012; Mitchell & Leonhardt, 2010) and HRO-related safety principles such as commercial licencing (Bourgeon et al., 2013; Butcher, 2002; Federal Aviation Administration, 2017, 2020; The European Union Aviation Safety Agency, 2019) and SOPs (Hoermann & Goerke, 2014; The National Archives and Records Administration and The United States Government Publishing Office, n.d.d). Knowing more about how individual differences and work experiences prompt different types of peerinesses and OPS needs would decrease the risk of having employees withdrawing from OPSNs or having employers implement OPSNs on terms that will reduce or even reverse the positive effects of OPS on employee mental wellbeing.

Secondly, this study should consider the influence of culture on COs' and CAPs' views of OPS. The social identity theory (Tajfel, 1970), and Schein's (1990) perception of organisational culture as mutually developed and reformed assumptions on how to perceive, think and feel about matters affecting a social network that is collectively respected and shared amongst all of its members, implies that non-CAPs in managerial positions are in a position to inflict a sense of 'we' rather than 'us against them'. Taking current findings into consideration, this suggests that COs entrusting authority- and non-authority-related OPSNs delivering different types of OPS will be better at establishing collaborative cultures wherein CAPs' OPS needs are listened to and respected. Gaining a better understanding of factors that promote and or inhibit OPSNs can therefore lead to valuable knowledge on when employees' feel

comfortable to create and reach for OPS. This kind of information can be of extra importance in cultures described as unjust or prejudicial as work environments suffering from social stigma and discrimination have shown to hamper the detection of subtle health issues (Wollaston, 2016). Moreover, cultures with views of CAPs as “accomplished, self-reliant” (DeHoff & Cusick, 2018, p. 8) may threaten CAPs’ sense of adequacy and capacity to seek OPS to cope with work-related factors affecting mental wellbeing. If this is the case, COs can be misled to believe that CAPs’ need for OPS is lower than required. To avoid similar misinterpretations research ought to be invested in the effect of cultural views on OPS-needs, such as machoism and invulnerability stereotypes (DeHoff & Cusick, 2018) prompted by traditional, professional and organisational perceptions of CAPs as “high achievers, competent, dutiful, disciplined, assertive, confident and calm in challenging situations” (Butcher, 2002, as cited in Bor et al., 2016, p.311). Similarly, to understand how traditional, professional and organisational views impact employees’ perception of perceived and received OPS (Gottlieb & Bergen, 2010) and if there are occupational differences, it is recommended that further research is conducted on culture, OPS-needs and self-reliance within and beyond the CAI.

## **5.5. Conclusion**

With CAPs subjected to a high level of work-related factors associated with mental wellbeing (Bor et al., 2016; Bor et al., 2002; Bor & Hubbard, 2006) and limited empirical understanding of peer support underpinned by peeriness (Daniels et al., 2017; Gillard et al., 2014; King & Simmons, 2018; Simoni et al., 2011) on CAP-related wellbeing (Bor et al., 2016), this study has set out to inductively explore OPS in relation

to employee mental wellbeing. This resulted in two key findings, demonstrating CAPs' experience of OPS as: 1) a specific and irreplaceable form of social support based on psychologically close working relationships derived through shared first-hand occupational experiences; and 2) a form of social support highly dependent on individual differences and work-related experiences to be perceived as adequate protection against profession- and employer-related factors affecting mental wellbeing negatively. Alongside contemporary theory and research on peer support underpinned by peerness on mental health recovery and concepts on social support within an occupational context, these findings have contributed to research on three levels. Firstly, by providing theoretical insight on OPS as a specific and irreplaceable form of work-related social support with a unique contribution to employee mental wellbeing. Secondly, by assisting employers with empirically-based advice on how to practically explore and introduce OPS to gain health-related benefits previously identified in research on occupational-related peer support and employee wellbeing within HROs and high-risk environments (e.g., Anderson et al., 2020; Howerton Child & Sussman, 2017; Pinto et al., 2013; Santilhano et al., 2019). Third and finally, this study has contributed by providing the CAI with an empirical understanding of how OPSNs can be incorporated within strategies aimed at assisting CAPs' coping with work-related factors affecting mental wellbeing. These are vital contributions as supporting a safer work environment will decrease the number of critical incidents associated with employee mental wellbeing, which ultimately will lead to organisations comprising of a healthier and more prosperous workforce (Aviationpros.com, 2011; Bor et al., 2016; Civil Aviation Authority, 2014; Kanki et al., 2010; Mitchell & Leonhardt, 2010). Thus, HROs and organisations operating in high-

risk or unconventional environments resembling the CAI are likely to encounter positive employee reactions as a result of adopting findings and recommendations derived through this study. However, there is a need to continue research on the relationship between individual differences and work-related experiences, peeriness and employee mental wellbeing (Barrera, 2000; Cutrona & Russell, 1990; Sarason & Sarason, 2009) to fully uncover the influence of OPS on employee mental wellbeing in HROs and organisations prone to critical incidents (Gunia et al., 2015; Mitchell & Leonhardt, 2010). A fair representation of OPS can only be attained by replicating this study and or committing to research within and beyond the CAI that builds on current findings on OPS.

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**Appendix A** - Participant information sheet, consent form, pre-interview survey and recruitment poster



**Participant Information Sheet**

***Social Support at Work and its Influence on Wellbeing:  
A Qualitative Study on Commercial Pilots in the Aviation Industry***

My name is Sirkka Jarlvik and I am conducting this research as a student in the PhD in Organisational Health and Wellbeing programme at Lancaster University, Lancaster, United Kingdom. You have been invited to participate in my study on social support at work and its influence on wellbeing. Before you make a decision, I would like to provide you with some background information. Please take your time to read this information carefully.

**What is the study about?**

The purpose of this study is to explore the types of social support (i.e. assistance and help within work) available to, and given by, commercial aviation pilots and how this affects their wellbeing. In particular I am interested in how the unique working conditions associated with this occupation (e.g. irregular shifts and dynamic team arrangements) impact upon the social support systems of pilots.

**Why have I been approached?**

You have been approached because the study requires information from people who are employed as a commercial aviation pilot within the aviation industry.

**Do I have to take part?**

No. It is completely up to you to decide whether or not you take part in this study.

**What will I be asked to do if I participate?**

If you decide you would like to take part, you will be asked to complete a short survey and go through an interview (face-to-face or virtually through Skype) that will last for approximately 60 minutes. During the interview you will be asked questions related to social support at work and how this may or may not relate to your wellbeing.

**Will my data be identifiable?**

The information you provide will be kept confidential as far as possible. If what is said during the interview makes me think that you (or someone else) are at significant risk of harm, I will have to break confidentiality and speak to any of my two supervisors (identified below) about this. If possible, I will tell you if I have to do this. If you choose to do the interview virtually through Skype, you should also be aware that the internet is not guaranteed to be a completely secure means of communication. I may also use direct quotes from participants in the final report, but these will be kept anonymous (i.e., any information that can be used to identify you will be removed, such as name and date of birth). The data collected for this study will be stored securely and only the researcher conducting this study (me) and my two supervisors will have access to this data:

- Audio recordings will be stored on Lancaster University's encrypted server for 10 years in case original recordings need to be consulted post-dissertation examination and/or be used for publishable journal articles in the future. Recordings held by the researcher will be destroyed once the project has been examined.
- Hard copies of interviews will be kept in a locked cabinet.
- The files on the computer will be encrypted (that is no-one other than the researcher will be able to access them) and the computer itself password protected throughout the project.
- The typed version of your interview will be made anonymous by removing any identifying information including your name.
- All your personal data will be confidential and will be kept separately from your interview responses.

**What will happen to the results?**

The results will be summarised and reported in a dissertation and may be submitted for publication in an academic or professional journal.

**Are there any risks?**

There are no risks anticipated with participating in this study. However, if you experience any distress following participation you are encouraged to inform the researcher and contact the resources provided at the end of this sheet.

**Are there any benefits to taking part?**

Although you may find participating interesting, there are no direct benefits in taking part.

**Who has reviewed the project?**

This study has been reviewed by the *Faculty of Health and Medicine Research Ethics Committee* (FHMREC), and approved by the University Research Ethics Committee at Lancaster University, UK.

**Where can I obtain further information about the study if I need it?**

If you have any questions about the study, please contact the main researcher (me): [s.jarlvik@lancaster.ac.uk](mailto:s.jarlvik@lancaster.ac.uk) or any of my supervisors;

Dr. Alison Collins: [a.m.collins@lancaster.ac.uk](mailto:a.m.collins@lancaster.ac.uk)

Dr. Sabir Giga: [s.giga@lancaster.ac.uk](mailto:s.giga@lancaster.ac.uk)

**Complaints**

If you wish to make a complaint or raise concerns about any aspect of this study, and do not want to speak to the researcher or any of the supervisors, you can contact;

Professor Bruce Hollingsworth

Tel: +44 (0) 1524 594 154

[b.hollingsworth@lancaster.ac.uk](mailto:b.hollingsworth@lancaster.ac.uk)

Faculty of Health & Medicine

If you wish to speak to someone outside of the *Organisational Health and Wellbeing Doctorate Programme*, you may also contact;

Professor Roger Pickup

Tel: (01524) 593746

[r.pickup@lancaster.ac.uk](mailto:r.pickup@lancaster.ac.uk)

Faculty of Health and Medicine

**What if I decide to participate?**

If you wish to take part in this study after reading this information, please contact me: [s.jarlvik@lancaster.ac.uk](mailto:s.jarlvik@lancaster.ac.uk)

**Thank you for taking the time to read this information sheet!**

**Resources in the event of distress**

Should you feel distressed either as a result of taking part, or in the future, you are encouraged to contact your local GP. Alternative sources of assistance might be the occupational health care department within your organisation or your company employee assistance programme, where available. The following resource may also be of assistance: <http://www.mind.org.uk>.

*Consent form*

Social Support at Work and its Influence on Wellbeing:  
A Qualitative Study on Commercial Pilots in the Aviation Industry

I am asking if you would like to take part in a research project aimed to explore the influence of social support on wellbeing. Before you consent to participating in the study I ask that you read the participant information sheet and mark each box below with your initials if you agree. If you have any questions or queries before signing the consent form please speak to the principal investigator, i.e., (me) Sirkka Jarlvik.

**Please initial  
each statement**

- I confirm that I have read the information sheet and fully understand what is expected of me within this study
- I confirm that I have had the opportunity to ask any questions and to have them answered
- I understand that the interview will be audio recorded and then made into an anonymised written transcript
- I understand that audio recordings will be kept until the research project has been examined
- I understand that my participation is voluntary and that I am free to withdraw from the study at any time before and up to two weeks following the interview without giving any reason, and without my status as an individual being affected
- I understand that once my data have been anonymised and incorporated into themes, it might not be possible for it to be withdrawn, though every attempt will be made to extract my data, up to the point of publication

- I understand that the information from the short survey and my interview will be pooled with other participants' responses, anonymised and may be published
- I consent to information and quotations from the short survey and my interview being used in reports, conferences and training events
- I understand that the researcher will share and discuss data with her supervisors
- I understand that any information I give will remain strictly confidential and anonymous unless it is thought that there is a risk of harm to myself or others, in which case the principal investigator will need to share this information with her research supervisors
- I understand that if I choose to do the interview over Skype, the internet is not guaranteed to be a completely secure means of communication
- I consent to Lancaster University keeping the short survey and transcriptions of the interview for 10 years after the study has finished
- I consent to take part in the above study

Name of Participant:                      Signature:                      Date:

Name of Researcher:                      Signature:                      Date:



## Pre-Interview Survey

To make the most of the session, please complete this survey and forward it to me prior to the interview. The information provided will be used to gain a better understanding of you, your background and situation at work. All information will remain confidential as far as possible. If any details are used in the final dissertation (e.g., to describe the sample), they will be anonymised and incorporated into themes.

<b>Demographics and Background Questions</b>	
<b>Surname / Family Name:</b>	<b>Gender:</b> <i>Female / Male</i>
<b>First / Given Name(s):</b>	
<b>Year of birth:</b>	
<b>Nationality:</b>	
1. <i>Current country of residence?</i>	
<b>Relations</b>	
2. <i>Are you living on your own?</i>	
2.1. <i>If no, who are you living with?</i>	
3. <i>Do you have children?</i>	
3.1. <i>If yes, how many are under 18 years old?</i>	
3.2. <i>If yes, how many are over 18 your old?</i>	
<b>Work Experience</b>	
4. <i>How many years have you been flying?</i>	
5. <i>Approximately, how many flight hours do you have logged?</i>	
6. <i>Are you a captain at the moment?</i>	
6.1. <i>If yes, hor how many years have you been flying as a captain?</i>	

**Employer**

*7. How many years have you worked for your current airline?*

*7. 1. What size is the airline you are flying for at the moment (highlight option)?*

Small ( < 100 employees)

Medium (100 - 500 employees)

Large ( > 500 employees)

*7. 2. Where is the airline based?*

**Work Schedule**

*8. Are you on a shift rota?*

*8. 1. If yes, how far in advance are you informed of your shift rota?*

*9. On average, how many hours do you fly per month?*

*9.1. Approximately, how many flights is that?*

*9.2. On average, how many of these flights include a layover away from country of residence?*

**Study on  
Social Support at Work  
and its Influence on Wellbeing**



**Are you a commercial aviation pilot  
keen to participate in a study about  
Social Support at Work and its Influence on Wellbeing?**

Please contact me, Sirkka Jarlvik,  
a PhD student at Lancaster University for further information:  
[s.jarlvik@lancaster.ac.uk](mailto:s.jarlvik@lancaster.ac.uk)

## **Appendix B** - Topics covered during interviews and examples of semi-structured interview questions

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### PART I - Interview brief

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#### *Topics covered during brief*

##### Study-related information

A summary of the participant information sheet

##### Confidentiality

Confidentiality and its limits (use of quotes, self-harm and risks of using internet)

##### Withdrawal

The possibility to withdraw from the study at any time before and up to two weeks following the interview without giving any reason. If the request to withdraw comes after these two weeks, and data have been anonymised and incorporated into themes, it might not be possible for the information provided to be withdrawn. Nevertheless, every attempt will be made to extract the information, up to the point of publication.

##### Recording

Permission to record the interview

##### General questions

Any questions about the study and or the information provided in the participant information sheet

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### PART II - Data collection

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#### *Examples of semi-structured questions for data collection (with probes)*

Which of your colleagues are willing to listen to your job-related problems?

...when are they willing to listen to you?

...how often are these individuals pilots?

...why do you talk to other pilots about your problems?

...how helpful is it to talk through job-related problems with other pilots?

...what can pilots give that other colleagues can't?

...do you keep in touch with other pilots when you are not flying and why?

Can you give me an example of when you have provided support to another pilot?

...how do you think your support helped your colleague to cope with the event?

...do you think your ability to help would have been different if you were not a pilot  
and why?

What are the benefits of talking informally to other pilots?

...how does this differ from more formal [occupation-related] peer support programs?

Can you give me an example of a work issue that you have found useful to discuss with another pilot?

...how do you think he or she managed to help your deal with this event?

...do you think it had a positive effect on your wellbeing and why?

...how do you think the support given has helped you to do your job?

...would the outcome be different if the support came from a non-pilot and why?

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### PART III - Wrap-up

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#### *Examples of semi-structured questions and topics covered during wrap-up*

Anything else that you would like to add regarding pilot-to-pilot support and how it affects pilots' wellbeing?

Any other questions and or concerns regarding what we have discussed?

#### Thanking participants

Thanking the participant for participation in the study

#### Describing next steps and dissemination of results

Provide information about next steps and how final results will be shared

#### Snowballing

Remind participants to forward the study invitation letter to any other CAP fitting the inclusion criteria and likely to participate in the study

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### Appendix C - Illustration of how the data analysis evolved over time

Phase 1	Description	Outcome
Getting familiar with data items	<ul style="list-style-type: none"><li>- Data transcribed using <i>f4</i></li><li>- Reading and re-reading transcribed data</li><li>- Initial patterns identified and noted</li></ul>	<ul style="list-style-type: none"><li>Examples of initial patterns identified and noted;</li><li>Work (= aspects of work with the potential to influence psychological wellbeing)</li><li>Job resources (= job resources with a positive influence on psychological wellbeing)</li><li>Job demands (= job demands with a negative influence on psychological wellbeing)</li><li>Coping (= what CAPs do to cope with work-related challenges)</li><li>Support (= characteristics of support provided)</li></ul>

Phase 2	Description	Outcome
Generating initial codes	<ul style="list-style-type: none"> <li>- Transcripts uploaded in ATLAS.ti</li> <li>- Data extracts associated with the research question coded systematically across the entire dataset</li> <li>- Coded data collated and rearranged to fit the entire dataset</li> </ul>	<p>Examples of initial codes, including names and definitions;</p> <hr/> <p>Work (= aspects of work with the potential to influence psychological wellbeing)</p> <ul style="list-style-type: none"> <li>Colleagues (= CAPs relation to colleagues)</li> <li>Job description (= CAP describes his or her job as a CAP)</li> <li>Airline (= characteristics of the airline the CAP is flying for)</li> <li>Cockpit (= what goes on in the cockpit)</li> </ul> <p>Job demands (= features of work with a negative influence on mental health: factors associated with work during or outside work hours that have a negative impact on CAPs' subjective interpretation of one's mental health)</p> <ul style="list-style-type: none"> <li>Consequences (= job demands with a negative influence on psychological wellbeing)</li> <li>Type (= description of the job demand)</li> </ul> <p>Job resources (= features of work with a positive influence on mental health: factors associated with work during or outside work hours that have a positive impact on CAPs' subjective interpretation of one's mental health)</p> <ul style="list-style-type: none"> <li>Consequences (= job resources with a positive influence on psychological wellbeing)</li> <li>Type (= description of the job resource)</li> </ul> <p>Coping (= what CAPs do to cope with work-related challenges)</p> <ul style="list-style-type: none"> <li>Adapting behaviour (= changing behaviour)</li> <li>Adapting verbally (= changing verbally)</li> <li>Confide (= who the CAP is comfortable to open up to)</li> </ul>

Phase 2 (continued)	Description	Outcome
Generating initial codes	<ul style="list-style-type: none"> <li>- Transcripts uploaded in ATLAS.ti</li> <li>- Data extracts associated with the research question coded systematically across the entire dataset</li> <li>- Coded data collated and rearranged to fit the entire dataset</li> </ul>	<p>Support (= Support from another individual: when a CAP approaches or is approached by another individual for support on an issue associated with work)</p> <p>Attribute (= characteristics of support provided)</p> <ul style="list-style-type: none"> <li>Method (= how support has been provided)</li> <li>Source (= from who the support has been provided)</li> <li>Prompt (= why support has been provided)</li> <li>Location (= where support has been provided)</li> <li>Quality (= form om support provided)</li> </ul> <p>Content (= what is the support provided related to)</p> <ul style="list-style-type: none"> <li>Experience (= support provided in relation to experience or knowledge)</li> <li>Gender (= support provided in relation to gender)</li> </ul>



Phase 3	Description	Outcome
Searching for themes	<ul style="list-style-type: none"> <li>- Descriptive and latent codes collated into potential themes</li> <li>- All data extracts relevant to the research question and each potential theme gathered and summarized</li> </ul>	<p>First round</p> <ul style="list-style-type: none"> <li>- Codes split into themes representing attributes and context of CAPs' experience of job demands, job resources and social support on mental health;</li> </ul> <hr/> <p>Context</p> <ul style="list-style-type: none"> <li>Aviation industry</li> <li>Colleagues</li> <li>Confide</li> <li>Management</li> <li>Preparation</li> <li>Professional</li> <li>Self-reliance</li> </ul> <p>Attributes</p> <ul style="list-style-type: none"> <li>Resources</li> <li>Demands</li> <li>Coping</li> <li>Relationship (familiar or unfamiliar)</li> <li>Occupation (peer or not-peer)</li> <li>Impression (like or don't like)</li> </ul>

Phase 3 (continued)	Description	Outcome
Searching for themes	<ul style="list-style-type: none"> <li>- Descriptive and latent codes collated into potential themes</li> <li>- All data extracts relevant to the research question and each potential theme gathered and summarized</li> </ul>	<p>Second round</p> <ul style="list-style-type: none"> <li>- Attribute themes refined to focus on peer support, and context themes refined to focus on business aviation</li> <li>- Positive and negative codes added (to demonstrate attribute and context codes' impact on mental health)</li> </ul> <p>Attributes</p> <hr/> <ul style="list-style-type: none"> <li>Work and non-work-related</li> <li>Relationship (peer and non-peer)</li> <li>Virtual</li> </ul> <p>Context</p> <ul style="list-style-type: none"> <li>People-related <ul style="list-style-type: none"> <li>Occupation</li> <li>Airline</li> </ul> </li> <li>Individual</li> </ul>

Phase 3 (continued)	Description	Outcome
Searching for themes	<ul style="list-style-type: none"> <li>- Descriptive and latent codes collated into potential themes</li> <li>- All data extracts relevant to the research question and each potential theme gathered and summarized</li> </ul>	<p>Third round</p> <ul style="list-style-type: none"> <li>- Attribute themes refined to focus on peer support and support provider</li> <li>- Neutral code added (in addition to positive and negative codes to demonstrate attribute and context codes' impact on mental health)</li> </ul> <hr/> <p>Peer support</p> <ul style="list-style-type: none"> <li>Relationship (known vs unknown)</li> <li>Form (structured sought vs unstructured random)</li> <li>Mode (face-to-face vs virtual)</li> <li>Setting (employer-related vs non-employer-related)</li> </ul> <p>Support provider</p> <ul style="list-style-type: none"> <li>Peer <ul style="list-style-type: none"> <li>Age</li> <li>Gender</li> <li>Nationality</li> <li>Relationship</li> <li>Trust</li> <li>Understanding</li> </ul> </li> <li>Self</li> </ul>

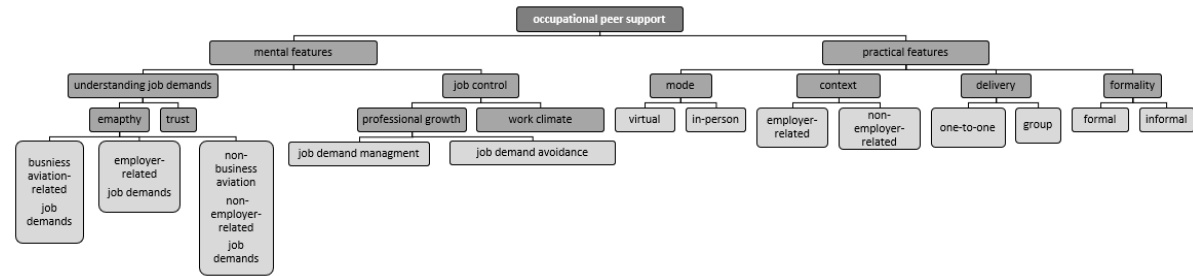
Phase 4	Description	Outcome																																																																
Reviewing themes	<ul style="list-style-type: none"> <li>- Verifying that themes identified reflect coded data extracts within data items and the entire dataset</li> <li>- Generating a reflective thematic map of the analysis</li> </ul>	<p>Thematic 'map' of the analysis</p> <table border="1"> <thead> <tr> <th>Theme</th> <th colspan="7">cognitive purpose</th> <th colspan="8">practical purpose</th> </tr> <tr> <th>Sub-theme</th> <th colspan="4">understanding</th> <th colspan="3">coping</th> <th colspan="4">context</th> <th colspan="4">approach</th> </tr> <tr> <th>Categories</th> <th colspan="3">empathy</th> <th>trust</th> <th colspan="3">professional growth</th> <th colspan="2">work</th> <th colspan="2">non-work</th> <th colspan="2">mode</th> <th colspan="2">form</th> </tr> <tr> <th>Sub-categories</th> <th>ERD</th> <th>CRD</th> <th>NCD</th> <th>venting</th> <th>GE</th> <th>MI</th> <th>AI</th> <th>G</th> <th>O2O</th> <th>G</th> <th>O2O</th> <th>f2f</th> <th>virtual</th> <th>formal</th> <th>informal</th> </tr> </thead> </table> <p> ERD = Employer-related demands  CRD = Commercial aviation industry (CAI)-related demands  NCD = Non-CAI non-employer-related demands  GE = to gain expertise  MI = to manage issues  AI = to avoid issues  f2f = face-to-face  G = group  O2O = one-to-one </p>	Theme	cognitive purpose							practical purpose								Sub-theme	understanding				coping			context				approach				Categories	empathy			trust	professional growth			work		non-work		mode		form		Sub-categories	ERD	CRD	NCD	venting	GE	MI	AI	G	O2O	G	O2O	f2f	virtual	formal	informal
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Phase 5	Description	Outcome
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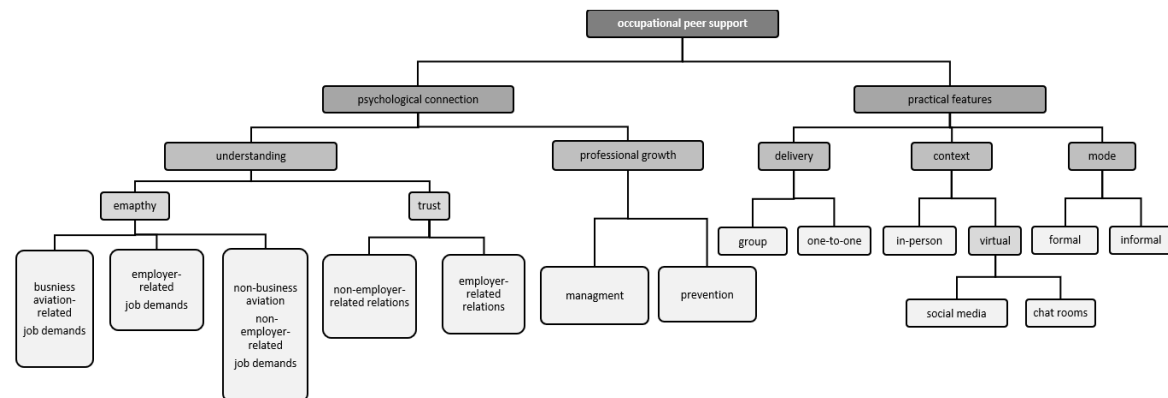
Defining and naming themes

- Themes identified defined and refined to reflect idiosyncratic and collective contribution to the overall story expressed by participants within the entire dataset
- Clear definitions and names for each theme created

Thematic 'map' of the analysis - second version



Thematic 'map' of the analysis - third version



Phase 6	Description	Outcome
Producing the report	<ul style="list-style-type: none"> <li>- A final thematic map of the analysis created (see Figure 5 in <i>Chapter 4: Findings</i>)</li> <li>- Data extracts selected to represent final themes identified (see <i>Chapter 4: Findings</i>)</li> <li>- Final thematic map discussed in relation to the research question alongside previous research and literature on peer support and mental wellbeing (see <i>Chapter 5: Discussion</i>)</li> </ul>	Thematic 'map' of the analysis - final version

