How to stand the nursing profession.
A study of proactive antecedents, self-efficacy, and organizational factors, and the mediation of cognitive appraisals on the outcome of stress and anxiety among nurses

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Abstract

In the light of present problems with stress related illness in organizations, often affecting women working in health care, the purpose of the current study was to examine proactive and malleable factors that could influence nurse’s perception of work stressors. Based on a model, self-efficacy and grouped organizational factors were examined as antecedents to the outcome of anxiety and stress via cognitive appraisals. The mediating role of the cognitive appraisals was further examined. The sample consists of 117 nurses and assistant nurses of which 112 were females working at a hospital in southern Sweden. The analyses were conducted with simple and multiple regressions. The result revealed that self-efficacy and the organizational factor together serve as antecedents to cognitive appraisals of stress, however, contrary to previous research, not to all appraisals. The mediating role of the cognitive appraisals showed that the harm appraisal mediate the relation between the organizational factor and the outcome of both anxiety and stress. The threat appraisal is found to partly mediate the relation between the organizational factor and the anxiety outcome as well as the stress outcome. The result further showed a none mediation role for the challenge appraisal between any of the antecedents and the outcomes, which suggest that the challenge appraisal do not serve as an underlying mechanism in either relationship. Other relations in the model are further shown and discussed in the study together with limitations, implications and suggestions of future research.

Keywords: Self-efficacy, support from co-workers, support from manager, trust in manager, fairness, cognitive appraisal, antecedents, positive psychology, stress, stressors, proactive, malleable, anxiety, nurses, assistant nurses.
The nursing profession is one of the most affected professions in terms of work-related stressors (Chen, Fang, & Fang, 2015; Elfering et al. 2006; Freeney & Tiernan 2009). Work related stressors may lead to ill-health and such has become a major reason for sick leave in Sweden where women in caring professions are overrepresented (Kivimaki et al., 2006; Stansfeld & Candy, 2006; Nieuwenhuijsen et al., 2010; Währborg, 2009; Försäkringskassan, 2015). Stress related ill-health has had a great negative effects on individuals (Försäkringskassan, 2015; Währborg, 2009) and on organizations since employees with good health are more likely to be less absent from work (Hanebuth, Meinel & Ficher, 2006) as well as perform better (Darr & John, 2008). However, a person’s response to work stressors could partly be a matter of mindset in the sense of an individuals’ self-efficacy, which refers to individual’s beliefs in their own ability to execute a specific task in a given situation and to achieve the desired result (Bandura, 1977). Self-efficacy could be viewed as a proactive factor that promotes health since a high degree of self-efficacy may increase the possibility for individuals to perceive stressors as a challenge rather than a threat (Bandura, 1977; Luthans, Avolio, Avey, & Norman, 2007; Luthans, Youssef, & Avolio, 2007). This view is further confirmed by research that found a negative relationship between a high degree of self-efficacy and work-related stress (Prati, Pietrantoni & Cicognani, 2010; Rennesund & Saksvik, 2012; Sonnentag & Spychala, 2012), and further that a high degree of self-efficacy lower an individual’s subjective stress (Wiedenfield et al., 1990). Self-efficacy may furthermore be viewed as a proactive personal antecedent to cognitive appraisals of stress (Avey et al., 2008; Lazarus & Folkman, 1984). Cognitive appraisals could be explained as a fundamental cognitive process by which employees assesses their demands and opportunities when facing a stressor, with either the appraisal of challenge or the appraisals of threat and harm, which further influence emotional reaction to a stressor (i.e. negative or positive emotions) (Lazarus & Folkman, 1984). Lazarus & Folkman (1984) have stated that the uniqueness of an individual’s response to stressors is depending on personal antecedents (i.e. such as self-efficacy) as well as situational antecedents and that these together influence the individual’s interpretation of stressors. Situational antecedents could be viewed as positive organizational factors, (e.g. such as trust in management, and support from organizations and coworkers) that represent important encouraging factors to employee’s perception of stressors (Mishra & Spričitzer, 1998; Self, Armenakis & Schraeder, 2007). Moreover, situational antecedents have been found to be positively related to cognitive challenge appraisals (Mishra & Spričitzer, 1998; Self, Armenakis & Schraeder, 2007). Thus, contributing factors to individual difference of perception of work stressors could be explained by proactive personal
(i.e. self-efficacy) and situation antecedents (i.e. organizational factors), that further are related to specific outcomes (i.e. anxiety and stress) via employee’s cognitive appraisals to work stress (Fugate et al., 2012).

Accordingly, stress related ill-health is a major problem both from an organizational and an individual perspective, but also from a gender perspective then women in nursing professions are overrepresented (Försäkringskassan, 2015; Währborg, 2009; Hanebuth et al., 2006; Darr & John, 2008). Thereof it is of interest to examine individual differences in the stress response among nurses with factors that are proactive as well as malleable. The purpose of the current study was then to examine personal and situational factors that may serve as antecedents in the outcome of anxiety and stress via cognitive appraisals of stress. To further examine the underlying mechanisms in the relation between the factors and the stress outcome the mediating role of the cognitive appraisals is additional to be explored.

**Stress related ill-health**

The most prominent cause of sick leave in Sweden today is mental illness, where burnout, anxiety, and depression are part of the diagnosis. In such diagnosed group women in caring professions are overrepresented, where links between psychosocial work environment and sick leave have been found as causes (Försäkringskassan, 2016) (i.e. The Swedish social insurance, 2016). This is also confirmed in a report by arbetsmiljöverket (2015) (i.e. the Swedish work environment authority, 2015), which showed that stress or other mental strains are the most common causes of occupational injury reports where women working with health care accounts for the largest part. The number of injury reports in this group has increased by 70% between 2010 and 2014, where social and organizational factors such as high workload, high work rate, or lack of support from colleagues and managers have been identified as main causes (arbetsmiljöverket, 2015). These reporting facts are supported by several studies conducted both in Sweden and in other countries, where the nursing profession has been found to be highly affected in terms of work-related stressors (Chen, Fang, & Fang, 2015; Elfering et al., 2006; Freeney & Tiernan, 2009; Golubic et al., 2009 & Sveinsdóttir et al., 2006; Gardulf, Söderström, Orton, Eriksson, Arnetz, & Nordström, 2005; Rudman, Schüldt-Håård & Gustavsson, 2008; Brooker & Waugh, 2013). Contributing factors to work stressors in nurses professions have mainly been found to be high workload combined with absence of a sense of control (Chen, Fang, & Fang, 2015; Chang et al., 2006; Chang et al., 2007; Freeney & Tiernan, 2009; Mäkinen et al., 2003; Olofsson et al., 2003; Sveinsdóttir et al., 2006), and an overall time pressure that among other things leads to shortened or canceled breaks.
Further contributing factors was found to be organizational, like absence of confidence in the organization (Elfering et al., 2006; Hays et al., 2006; Olofsson et al., 2003) lack of trust in the board (Freeney & Tiernan, 2009; Landa et al., 2008; Tyson et al., 2002) and unclear allocation of responsibilities (Sveinsdóttir et al., 2006). Poor relationship with coworkers was also found to be an important negative factor to nurse’s responses to work stress (Chang et al., 2006; Chang et al., 2007; Landa et al., 2008; Mäkinen et al., 2003) as well as absence of feedback from manager that further increased feelings of insecurity (Freeney & Tiernan, 2009; Olofsson et al., 2003).

**The Concept of Stress**

The concept of stress could be explained as a biological response where the organism's dynamic balance, so-called homeostasis, is threatened by external or internal stimuli. Hence, stress is actually a response to a stimulus (i.e. a stressor) for example; loud noises, a math test, winning lots of money, heat, own thoughts, or getting stuck in traffic (Arnetz & Ekman, 2013). A Stress response is initially a vital and natural function that gives the individual extra power, energy and sharpens the mind (Arnetz & Ekman, 2013). Stress responses may help individuals to fight or flight for their lives if necessary, but also to perform better physically as well as psychologically (e.g. when practicing sport or when conducting a math test). When an individual responds to a stimuli (i.e. a stressor) the sympathetic part of the automatic nervous system activates, which triggers a chain of events intended for the body to perform at its peak (e.g. muscles are tightened, blood pressure and breathing are increased, and energy in form of glucose are released into the bloodstream) (Ljung & Friberg, 2004; Ekman & Arnetz, 2002; Martini & Nath, 2009). If the stressor is positive (e.g. pumped up before a football game or exited before a date) feelings as exhilaration, eagerness or sometimes confidence may appear (Selye, 1984). However, if the stressor is negative (e.g. before a dental appointment or facing a divorce) feelings as fear, anger, frustration or anxiety may emerge (Selye, 1984). The biological response to a stressor is designed for a brief activation and then return to a calm state for recovery by activation of the parasympathetic part of the nervous system. This system is mostly active in restful situations and interacts with the sympathetic nervous system to calm down the effects after a stress response (Arnetz & Ekman, 2013). Despite the nature or magnitude of stressors, they are not harmful per se, on the contrary, stressors may help individuals to gain power when needed (Ljung & Friberg, 2004; Ekman & Arnetz, 2002; Brooker & Waugh, 2013; Weber, 1991). However, when the duration of a stress response (i.e. activation of the sympathetic nervous system) is prolonged or too frequent the body becomes obstructed to obtain sufficient
time to recover from the stressors (i.e. via the parasympathetic nervous system) (Arnetz & Ekman, 2013). Under these conditions, stress could have a negative effect on the body (Arnetz & Ekman, 2013; Ekman & Arnetz, 2002). Thereof, when an individual is exposed to stressors with insufficient time to recover health problems may occur (Melchior, Caspi, Milne, Danese, Poulton & Moffitt, 2007). Several studies have shown that prolonged stress is a major contributing factor to cardiovascular diseases as blood clots and heart attacks (Ghiadoni et al., 2000; Ljung & Friberg, 2004; Ekman & Arnetz, 2002; Kivimäki et al., 2012; Kivimäki et al., 2006) as well as a contributing factor to type 2 diabetes (Ljung & Friberg, 2004; Anderberg, 2001; Ekman & Arnetz, 2002; Björntorp, Rössner & Uddén, 2001; Chorusos, 1993), and further to have a negative effect on the immune system response to infections (McEwen, 2004; Mc Ewan & Stellar, 1993; Dotevall, 2001; Ljung & Friberg, 2004; Ekman & Arnetz, 2002). Research also suggest that prolonged stress may cause neuronal damage with cognitive problems such as slow thinking and deterioration of short-term memory as a result (Mc Ewen, 1998; Chorusos, 1993) as well as reduction of learning abilities (Ljung & Friberg, 2004; Ekman & Arnetz, 2002). Several studies have also found that stress responses may lead to ill health as sleep disorders, depression and anxiety (Åsberg et al., 2010; Anderberg, 2001; Ljung & Friberg, 2004; Ekman & Arnetz, 2002). Anxiety could be explained as an unpleasant mental state with feelings of fear, and are defined as "a future-oriented mood state in which one is not ready or prepared to attempt to cope with upcoming negative events" (Barlow, p. 1249, 2000).

**Individual differences in stress responses**

Although stress has been found to cause ill health there are individual differences in the interpretation of stressors, and hence differences in what way individuals respond to a stressor that eventually may cause ill health (Selye, 1984; Dotevall, 2001; Ljung & Friberg, 2004; Ekman & Arnetz, 2002). One individual may for example experience a stressful situation as a threat, while another may experience the same situation as an inspiring challenge (Mischel, 2004; Lazarus, 1966). According to Mischel (2004) and Lazarus (1966) these differences in perception rest on the assumption that an individual's thoughts, feelings, and behavior are the results of an interaction between the person and the situation. Thereof, the causes of individual differences in response to stressors at work could be viewed from a perspective where personal and environmental factors influence employee’s perception, and thereby their response. Such a perspective is partly built on the System theory which
emphasizes that all components (e.g. environment, individuals, and culture) should be viewed as an entirety (i.e. the organization), but also as interdependent (Kast and Rosenzweig, 1972). It is also partly built on the Transactional theory that is based on the notion that personal and environmental factors are intertwined and influence how individuals perceive stressors (e.g. as a threat or as challenge), and further to an emotional outcome (i.e. positive or negative emotions) (Kiefer, 2005; Probst, 2003). Thus, plausible causes to individual difference in responses to work stressors may be explained by personal and situational factors that are antecedents to emotional outcomes via cognitive appraisals

**Personal antecedents**

Self-efficacy is viewed as a personal psychological capital that promotes health in the sense that self-efficacy increase the possibility for individuals to perceive stressors as challenging rather than threatening (Luthans, Avolio, Avey, & Norman, 2007; Luthans, Youssef, & Avolio, 2007). Self-efficacy is a central concept in the Social cognitonal theory by Albert-Bandura (1989), which bases its notion of a triadic reciprocal determinism that refers human function to an interaction between behavioral, personal, and environmental factors (Wood & Bandura, 1989; Crothers, Hughes, & Morine, 2008). Self-efficacy could be described as a “can do approach” that reflect individuals optimistic belief in their ability to master demands, and thereto plays a significant role in how individuals approach life in general (Bandura, 1989). An individual’s sense of self-efficacy influences how she thinks, feel and behave, and thus her perceived capability of how to deal with challenging life events. In that sense, individuals may affect their own fate because they are both the producer as well as a product of their environment, and hence an individual’s sense of self-efficacy is viewed as a powerful outcome determinant in a variety of events (Bandura & Walters, 1959; Bullock & Merrill, 1980; Emmons & Diener, 1986).

According to Bandura (1986), an individual’s self-efficacy is developed through childhood and adolescence but is not considered to be set in adulthood. It is rather seen as malleable, at least to some extent depending on the strength of her self-efficacy. An individual's self-efficacy thrives from and is influenced by four sources; mastery of experience, vicarious experiences, social persuasion and psychological responses (Bandura, 1989).

Mastery of experiences refers to an individual’s previous experiences of a situation and depending on the consequences of the experience (i.e. success or failure), the individuals’ belief, and thus behavior, is reinforced by either strengthening (i.e. when succeed) or
weakening (i.e. when failed) the degree of self-efficacy. This source may also create a cognitive bias which may result in individuals making false beliefs about their environment and themselves. In addition, experienced of mastery of experiences is viewed as the main source of an individual’s self-efficacy (Bandura, 1986; Pajares & Schunk, 2001).

The second source is vicarious experiences (i.e. social modeling) and refers to that individuals’ beliefs in their own capability could be influenced by observing similar others. Whether similar others are successful or not, e.g. when performing a work task, it can influence the observers own beliefs to master comparable activities. Consequently, it can influence the observer’s degree of self-efficacy, which raises the observer’s degree of self-efficacy when the similar other succeeds, and get lower when similar other fail (Bandura, 1986; Pajares & Schunk, 2001).

The third source is social persuasion and refers to when an individual, for example, receive feedback when performing a task. If the feedback is encouraging and leads to goal-achievement, social persuasion might contribute to overcoming self-doubt and give the individual focus to perform at the best. Positive feedback moreover increases the degree of self-efficacy. However, if the feedback is negative in form of criticism, or if the individual is mocked, it may create or increase self-doubt, which further may decrease the degree of self-efficacy (Bandura, 1986; Pajares & Schunk, 2001).

The last source is psychological responses, which refers to in what manner an individual interprets physiological feedback (e.g. different emotions), which moreover influences the individual’s beliefs and degree of self-efficacy. If an individual experience anxiety when performing a speech, a weak self-efficacy may be developed for that situation. Due to that experience the individual may interpret psychological responses in similar situation (e.g. performing a speech) as anxiety, which further decrease the level of self-efficacy in similar situations. Conversely, if the individual experienced positive emotions (e.g. eagerness) self-efficacy may rise for similar situations (Bandura, 1986; Pajares & Schunk, 2001). Although psychological responses are seen as the least important source to self-efficacy, psychological responses may influence the other sources to self-efficacy. For example, when an individual observes a similar other (i.e. vicarious experiences) succeed with a task, the observer’s self-efficacy may increase. However, if the similar other exhibited negative feelings when succeeded a task, the observer’s beliefs to master comparable activities may be reduced or eliminated (i.e. due to the exhibited negative feelings) (Bandura, 1986).
The degree of an individual’s self-efficacy expresses itself through beliefs in the individual’s capability to master life in general or in specific situations. Individuals with a high degree of self-efficacy believe in their own abilities to master difficulties, which they tend to conceptualize as challenges (Bandura, 1986; Pajares & Schunk, 2001). They further motivate themselves with self-enhancing thoughts, and in face of setbacks they persist longer and tend to be extremely resilient. Moreover, individuals with a high degree of self-efficacy often experience positive emotions (i.e. exhilaration and eagerness) when facing difficulties. Those individuals tend to mostly succeed in their undertakings because they believe in their own capability, and even if facing setbacks, they are likely to try again to succeed. In contrast, individuals with a low degree of self-efficacy tend to have low beliefs in their capability, with self-doubt, and a tendency to conceptualize difficulties as threats, often with negative feelings as anxiety or worry (Bandura, 1986; Pajares & Schunk, 2001). Thus, if they do not believe in their own capability to succeed, they tend to give up easy. Moreover, individuals with a low degree of self-efficacy are found to be more vulnerable to stressors (Bandura, 1986; Luszczynska, Gutiérrez-Döna, & Swarzer, 2005). Individual’s degree of self-efficacy hence influences their thoughts patterns, their emotions and how they act, which further is reinforced by their behavior, in that sense individuals may create their own future (Bandura, 1986).

Bandura (1979) initially conceptualized self-efficacy as a domain and situation specific construct due to individuals different strength of self-efficacy depending on the domain (e.g. general good at school) or situation (e.g. good at math). A domain-specific measurement was thereof suggested to better predict particular outcomes (Bandura, 1997; Schwarzer & Jerusalem, 1995). However, Bandura (1977) further stated that individuals with the belief to master only a few domains or situations, possesses a low degree of general self-efficacy (i.e. the total strength of self-efficacy is low), and individuals with the belief to master several domains or situations possess a high general self-efficacy (i.e. the totalize strength of self-efficacy is high). Based on that statement researchers have argued for the usage of a general self-efficacy measurement, because to predict global constructs such as depression or anxiety, a measure with general self-efficacy is of a greater interest than if it measures an individual's beliefs to handle life in general (i.e. the total strength of self-efficacy) (Ajzen, 1988; Wallstone, Wallston, Smith, & Dobbins, 1987). Along this line, several researchers have conceptualized self-efficacy to a general construct in their studies (Harter, 1978; Schwarzer & Jersulsalem, 1995; Shelton, 1990; Sherer et al., 1982). Bandura (1997) stated that individuals with a strong self-efficacy will not experience stress to the same extent when they are exposed to difficulties at work, as individuals with a weak self-efficacy.
This statement was supported by Cicotto et al (2014) who argues that self-efficacy is one of the most important factors when predicting job satisfaction, and moreover to predict individuals differences in whether demanding work situations are perceived as stressful or not. Those findings are further supported by several organizational studies, which found self-efficacy to correlate negatively with work-related stress (Prati, Pietrantoni & Cicognani, 2010; Rennesund & Saksvik, 2012; Sonnentag & Spychala, 2012). In the same line, several studies found that self-efficacy had a moderating effect on demands in a work context, which moreover was found to correlate negatively with psychological stress, as well as reduced anxiety and dysfunctional relations in the organization (Panatik, O'Driscoll & Anderson, 2011; Sonnentag and Spychala (2012). Similar research provides more support for self-efficacy to have a moderating effect on employee’s perception of work demands, and whether the outcomes resulted in burnout or other psychosomatic disorders, or not (Salanova, Peiró & Schaufeli, 2002; Ventura, Salanova & Llorens (2015). Self-efficacy have moreover found to be negatively related to anxiety, depression, stress, burnout, and general health complaints including physical symptoms (Hinz et al., 2006; Luszczynska et al., 2005; Schwarzer et al., 1999; Salanova, Peiró & Schaufeli, 2002; Ventura, Salanova and Llorens ;2015). Self-efficacy have also been found to correlate positively with other positive factors such as work satisfaction, self-esteem, optimism and positive emotions (Luszczynska et al., 2005).

Self-efficacy is further viewed as malleable, since the sources (i.e. mastery of experience, vicarious experiences, social persuasion and psychological responses) of self-efficacy may be influenced by the environment, at least to some extent depending on the strength of self-efficacy (Bandura, 1989; Gist & Mitchell, 1992). The prospect of increase self-efficacy has been studied in organizational contexts, where modeling training and self-management has been examined to increase self-efficacy and given good results (Frayne & Latham, 1987; Gist, 1989; Gist et al., 1989; Zoeller, Mahoney, & Weiner, 1983). Moreover, Andrews & Debus (1978) used operant condition in a succeed attempt to improve self-efficacy. Studies have also shown that self-efficacy may be increased via verbal persuasion (Zlomuzica, Preussner, Schneider, Margraf, 2015) and increased by manipulation of the social environment (McAuley, Talbot, & Martinez, 1999; Turner, Rejeski, & Brawley, 1997)

In addition, although Bandura (1977) do not dismiss genetics as a contributing factor to an individual’s degree of self-efficacy, he emphasizes social factors as the main sources. However, in a recently conducted twin study from Norway, that explored heritability as a
possible source to self-efficacy, the result showed that 75% of general self-efficacy could be explained by genetic factors (Waaktaar & Torgersen, 2013).

Positive situational antecedents of stress appraisals

Positive situational factors could be viewed as determinants of self-efficacy, thus for example-social support at work that has been found to influence an individual’s degree of self-efficacy (Bandura, 1986; Talbot, Nouwen, Gingras, Gosselin & Audet, 1997). Positive situational factors could also be viewed as proactive to work stress, due to the finding that they enhance the view of stressors as challenges rather than threats (Lazarus & Folkman, 1984). This view is supported by several studies that have reported situational factors such as social support to positively influence employee’s perception to stressors and to have a direct effect on cognitive appraisals of stress (Lazarus & Folkman, 1984; Hobfoll, 1989; Wilcox & Vernberg, 1985; McIntosh, 1991). Social support is defined by Cobb (1976) as “information leading to the subject to believing [they are] cared for and loved, is esteemed and valued and belongs to a social network of communication and mutual obligation” (Cobb, 1976 p 301). Several studies have further reported social support to be negatively related to perceived stress among employees (Lazarus & Folkman, 1984; Eskin & Parr, 1996; Luria & Torjman, 2009). Similarly, in a meta-analysis social support was found to decrease perceived work stressors among employees (Viswesvaran, Sanchez & Fisher, 1999). Social support has further been shown to provide employees with positive effects as well as positive experiences, which ultimately influences perceived well-being (Viswesvaran, et al., 1999; Monnot & Beehr, 2014). This factor could be divided into support from co-workers and support from managers, where support from co-workers was found to have a significant positive relation with fewer stress responses (Happell et al., 2013). Furthermore, Berlanda et al. (2008) found that support from co-workers among nurses was an important factor in their perception of stressors. Support from manager has also been examined in several organizational studies. Those studies showed that low support from manager increased employee’s perception of stress, which may indicate that support from the manager is a positive factor to the perception of work stress (Happell et al., 2013; Verhaeghe, Vlerick, Backer, Maele & Gemmel, 2006; Taylor, White & Muncer, 1999).

Perceived justice could also be viewed as a positive situational factor to work stress, due to the positive relation between justice and low perception of stress (Lind, Kulik, & Ambrose, 1993). Justice in an organizational context could be explained by employees perceiving the overall conditions in their workplace as just and fair, or it could be explained
with the following quote: “Justice includes a procedural component (the extent to which decision-making procedures include input from affected parties, are consistently applied, suppress bias, and are accurate, correctable, and ethical) and a relational component (polite, considerate, and fair treatment of individuals” (Elovainio, Kivimäki & Vahtera, p.1, 2002).

A longitudinal research from Finland showed that perceived justice in an organization was related to perceived health and sick-leave among the employees (Elovainio, Kivimaki, & Vahtera, 2002). In the same context, justice was found to be related to psychiatric disorders (Kivimaki, Elovainio, Virtanen, & Stansfeld, 2003). Furthermore, previous studies have found justice to be related with employee’s behavior and emotions in their relations with co-workers in the organization (Bies & Moag, 1986; Kramer & Tyler, 1995), as well as an important aspect of the relationship between manager and employees whereof justice is also found to be related to trust (Lind, Kulik, & Ambrose, 1993). Trust in an organizational context is defined as” the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer, Davis & Schoorman, p. 712, 1995). Applied to trust in manager, Mishra & Speitzer (1998) explained trust as the belief employees have in their manager to act with concern and in the interest of the employee. Additionally, Mishra & Speitzer (1998) proposed that trust in management serve as a positive antecedent to cognitive appraisals and thereby leads to a decrease of threat appraisals. Other researchers have also found trust in an organizational context to lower employee’s perception of work stress as well as be beneficial to positive emotions and behavior (Pitariu & Rus, 2015).

The situational factors social support, justice and trust could be viewed as coexisted since each factor is likely to affect each of the other. Social support requires two parts; a receiver and a giver, where positive affections are expressed to give and receive care and support. This process is likely to include trust, due to trust implying a belief in an authentic concern between the parts (Mayer et al., 1995). Perceived justice further brings assumptions of fair treatment and consideration (Lind, et al., 1993), which may imply reinforcement of social support as well as trust. Additionally, reviewed situational factors are likely to be alterable. A transformational leadership may, for example, improve those factors considering this leadership style is found to have the ability to increase confidence and trust among their employees and to positively influence the feeling of belonging to a group (Conger & Kanungo, 1998; Shamir, House, & Arthur, 1993). Accordingly, reviewed situational factors could be grouped to a single factor.
Situational factors together with personal factors are considered to be central to work-related stress, and according to Cooper & Marshall (1976), a possible guide to adaptation. This view is supported by other researchers that state that personal and situational factors together shape an individual’s interpretation of stressors at work (Cooper, Dewe & O’Driscoll, 2001). The same argument applies to Schwarzer (2014) that found personal and situational factors to be a significant predictor to appraisals of stress. Which additionally are supported by Lazarus & Folkman (1984) that emphasize the importance of the interaction between personal and situational factors in the process of cognitive appraisals.

**Cognitive appraisals of stress**

Cognitive appraisals of stress are fundamental cognitive processes that could be explained as an individual’s personal perception, interpretation, and final assessment of a stressor (Folkman, 2008; Knoll, Schwarzer, Pfüller, & Kienle, 2009). When an individual is faced with a stressful situation, he/she makes an assessment (i.e. primary appraisals) of eventual demands or opportunities in order to evaluate which appraisal (i.e. challenge, harm or threat) that relate to the situation (Lazarus & Folkman, 1984; Donovan et al., 2002). The assessment is partly based on similarly experienced situations, such as an individual facing a math test with previously positively related outcomes (i.e. performed well), which then increases the prospect for the individual to appraise the situation as a challenge in that this appraisal represents an assessment of a possible gain (Lazarus & Folkman, 1984; Donovan et al., 2002). However, if past experience resulted in a negative outcome (e.g. loss), the possibility that the individual appraises the situation as a threat or harm increases. The differences between threat and harm appraisals are that threat appraisal represent assessment of anticipatory possible losses and harm appraisals represent assessment of retrospective or pass losses (Lazarus & Folkman, 1984; Donovan et al., 2002). However, personal and situational factors are as well important for the assessment of a situation, and whether to appraise the situation as a challenge, harm or a threat (Lazarus & Folkman, 1984; Donovan et al., 2002). Self-efficacy have been found to affect an individual’s assessment of stressors, since the degree of self-efficacy may influence an individual’s appraisal of a stressor. For example, individuals with a high degree of self-efficacy have great confidence in their ability to deal with obstacles and may thereof appraise a situation as a challenge rather than a threat, although a previously negative outcome. Situational factors, such as social support, have also been found to serve as a factor that influences individuals appraisals of situations, where high
social support was found to positively influence the assessment of a stressor as a challenge (Schwarzer, 2014; Lazarus’s, 1999).

In addition, an individual’s cognitive appraisals to work stress are important since they represent the interrelation between person and situational factors. This further is a mean for individual’s interpretation of demanding situations as strains or opportunities. A cognitive appraisal is thus a possible predictor for responses to stressors (Cooper & O’Driscoll, 2001), and each cognitive appraisal (i.e. challenge, threat, harm) are further linked to different emotional outcomes (Schwarzer, 2014; Lazarus’s 1999).

**Emotional outcomes of cognitive appraisals of stressors**

Cognitive appraisals of stress have been found to influence positive and negative emotional outcomes that either has prospective or retrospective focus (Folkman & Lazarus, 1985) and are further viewed as a multidimensional construct (Weiss and Cropanzano, 1996). Emotions in the stress appraisal context are defined as “complex, organized, psychological and physiological reactions consisting of action impulses, feelings, and somatic reactions” (Folkman and Lazarus, 1991, p. 209). When an individual is facing a situation, e.g. giving a presentation, the situation could be perceived with a challenge appraisal (i.e. I will do great with my presentation), accompanied by positive prospect emotions such as confidence, exhilaration, eagerness and hopefulness. However, when the same situation is appraised as a threat (i.e. I don’t like to speak in front of people), negative prospect emotions as worry, fear, anxiety, and helpless may appear. Negative emotions also manifest in the harm appraisal which represents retrospective losses (i.e. last time I presented I fainted) with emotions as guilt, anger, and frustration. Individual’s emotional outcomes to cognitive appraisals are viewed as important, being found to be linked to stress responses.

The link between certain cognitive appraisal and emotional outcome has been supported in several studies. However, some researchers have labeled the dimension of the appraisals in different ways, nonetheless the result shows a clear connection between positive appraisals (e.g. challenge) and positive emotions, as well as between negative appraisal (e.g. threat and harm) and negative emotions (Hazerbroek, Howells, & Day, 2001; Frijda, Kuipers, & Ter Schure, 1989; Lerner & Keltner, 2000; Roseman, Spindel, & Jose, 1990; Smith & Ellsworth, 1985; Zohar & Dayan, 1999; Kelsey & Leitten, 1993). Previous organizational research has shown cognitive appraisals to be linked to emotional outcomes and that negative emotional outcome further is correlated with psychological and physical ill-health (Scheck &
Kinicki, 2000; Fugate, Harringson & Kinicki, 2011). Similar, in an organizational change context cognitive appraisal as threat have been found to correlate with negative emotions, and further to be linked to ill-health among employees (Kiefer, 2005; Probst, 2003). Some studies have further found situational variables to predict different emotional outcomes (Smith & Ellsworth, 1985; Tomaka, Blascovich, Kelsey & Leitten, 1993; Roseman, Spindel & Jose; 1990). For example, Mishra & Sprietzer (1998) found situational factors, such as trust in management and perceived justice, to decrease employee’s threat appraisals during an organizational change.

The process of stress involving antecedents, appraisals, and emotional outcome have further been suggested to operate according to reciprocal interaction, which means that each construct in the stress process may manifest itself as either antecedent, appraisals or as outcome (Lazarus, 1999).

**Criterion and limitations**

With the acknowledgment that there are many potential personal and situational factors that may influence employees perception of stressors, the selection of factors in the present study was based on a certain predetermined criterion. The factors had to be related to work stress and to serve as antecedents to cognitive appraisals. The selected factors also had to be proactive and malleable, which might be favorable if this study’s findings potentially may contribute to future interventions. A further criterion was the use of validated and reliable instruments for each variable, with the exception of cognitive appraisals that was constructed by the author. Furthermore, in the present study, the dimension of the Transactional model of stress is limited to primary appraisals (i.e. challenge, harm, and threat) wherein the proposed emotional outcomes (i.e. positive emotions and negative emotions) are assumed by the appraisals, perceived stress, and anxiety. Based on the reasoning in reviewed paragraph about situational factors, here and throughout the present study the situational factors support from co-workers, support from manager, trust in management and perceived fairness in the workplace will be grouped into a single factor; the organizational factor, which then will refer to the situational factors. Since this study also aim to highlight the fact that women today belong to the most exposed group in terms of work stress, the choice of participants fell on nurses. This was based on that nurses belongs to one of the most exposed groups in terms of work stress, but also that women constitute 90% in this profession (SCB, 2016). It should also be added that each criterion and factor in the present study have been based on an organization context, which is of importance then context provide constraints as well as
opportunities to better understand findings within its elements (Griffin, 2007; Chatman, 1989; Schneider, 1987).

**Purpose**

Work related stress is accordingly found to be a contributing factor to stress related ill-health, which is the most prominent cause of sick leave in Sweden today. This is considered to be a great problem from an organizational perspective, an individual perspective and from a gender perspective, considering women over representing workers in health care. However, individuals may respond differently to work stressors and thus differ in the exposure of duration and/or frequencies of stress responses, which further are linked to an eventual outcome with stress related ill-health. According to reviewed research in previous paragraphs individual’s differences in stress responses could be explained by personal (i.e. self-efficacy) and organizational factors (i.e. support from manager, support from coworkers, trust in management and perceived fairness) that further, via cognitive appraisals (i.e. challenge, threat and harm) may influence an individual’s perception to work demands (i.e. stressors), which may result in different emotions (i.e. positive or negative emotions), where negative emotions may lead to stress related ill-health, e.g. anxiety. However, self-efficacy and organizational factors may also directly influence stress outcomes, because they, single handedly, have been found to be negatively related to stress related ill-health.

The purpose of the study is to examine proactive and malleable factors that could influence nurses perception of work stressors. Self-efficacy and grouped organizational factors is to be examined as antecedents to the outcome of anxiety and stress via cognitive appraisals. This study will further examine the mediating role of the cognitive appraisals in the relation between the antecedents and the outcome of stress and anxiety. The direct relation between anxiety and stress and self-efficacy, as well as the direct relation between anxiety and stress and organizational factors is additionally to be examined.

**Hypothesis**

The hypotheses 1-14 are illustrated by a path model (Figure 1), where implied positive relations are illustrated with an unbroken line and implied negative relations are illustrated with a broken line.

Hypothesis 1: The degree of Self-efficacy is negatively related to perceived stress, where a high degree of self-efficacy decrease perceived stress.

Hypothesis 2: The degree of Self-efficacy is negatively related to perceived anxiety, where a high degree of self-efficacy decrease perceived anxiety.
Hypothesis 3: The organizational factor is negatively related to perceived stress, where the organizational factor decrease perceived stress.
Hypothesis 4: The organizational factor is negatively related to perceived anxiety, where the organizational factor decrease perceived anxiety.
Hypothesis 5: The degree of self-efficacy and the organizational factor are positively related to perceived challenge appraisal, where self-efficacy and the organizational factor increase challenge appraisals.
Hypothesis 6: The degree of self-efficacy and the organizational factor are negatively related to perceived threat appraisal, where self-efficacy and the organizational factor decrease threat appraisals.
Hypothesis 7: The degree of self-efficacy and the organizational factor are negatively related to perceived harm appraisal, where self-efficacy and the organizational factor decrease harm appraisals.
Hypothesis 8: Challenge appraisal is negatively related to stress, where challenge decreases perceived stress.
Hypothesis 9: Challenge appraisal is negatively related to anxiety, where challenge decreases perceived anxiety.
Hypothesis 10: Threat appraisal is positively related to stress, where threat increase perceived stress.
Hypothesis 11: Threat appraisal is positively related to anxiety, where threat increase perceived anxiety.
Hypothesis 12: Harm appraisal is positively related to stress, where harm increase perceived stress.
Hypothesis 13: Harm appraisal is positively related to anxiety, where harm increase perceived anxiety.
Hypothesis 14: Perceived stress is positively related to anxiety, where perceived stress increase perceived anxiety.
Further hypothesis is not displayed in figure 1
Hypothesis 15: Challenge appraisals will mediate between self-efficacy, the organizational factor and stress.
Hypothesis 16: Challenge appraisals will mediate between self-efficacy, the organizational factor, and anxiety.
Hypothesis 17: Threat appraisals will mediate between self-efficacy, the organizational factor and stress.
Hypothesis 18: Threat appraisals will mediate between self-efficacy, the organizational factor, and anxiety.

Hypothesis 19: Harm appraisals will mediate between self-efficacy, the organizational factor and stress.

Hypothesis 20: Harm appraisals will mediate between self-efficacy, the organizational factor, and anxiety.

Figure 1. Pathway diagram for the predicted relationships of the hypothesis
Method

Participants

The sample for the present study consists of 117 nurses and assistant nurses working at a hospital in southern Sweden. The demographic profile included 91 nurses and 26 assistant nurses of which 112 were females, 4 males, and one respondent declined the gender question. The age for the sample is between 20-63 years old with a mean of 42 years old, with 1-45 years in the profession with a mean of 18 years.

Procedure

Three directors of different departments (e.g. director of medicine) at a hospital in southern Sweden were contacted via e-mail and/or phone where they were informed of the purpose of the present study and asked to participate. This approach was necessary since the directors have to authorize distribution through employee’s work-related e-mail. Two directors accepted participation and one director declined. The directors then forwarded the request to participate to their managers in charge of different sub-departments within the director’s domain (e.g. heart department and neurological department). Each department manager further decided if their employees had the possibility to participate. Four department managers accepted and sent a request for participation by work-related e-mail addresses to nurses and assistant nurses employed at their department. The e-mail contained a link to the present studies survey together with information about the purpose of the study and that participation was voluntary. The recipients were approximately 130 nurses and 140 assistant nurses. The survey was active for two weeks and was answered by the responders during their working hours.

Research ethics

In each step of the process of the present study, from the first contact of the directors to data analysis, suggested ethical regulations has been followed (Rogelberg, 2008), meaning that all persons involved in the data retrieval process were informed that the participation was voluntary and that they at any time could cancel the participation. Further, all the collected data have been treated confidentially, and anonymity was applied to those who participated. In addition, each person involved in the data retrieval process received contact information for any questions regarding the study.

Instruments
The survey was web-based and created with Google forms (this tool was free of charge and free from advertising). The survey was in Swedish and consisted of 39 self-reported questions based on measuring instrument intended for the purpose of the study and demographics. Prior to the questions on the survey, the respondents were informed about the purpose of study with contact information for eventual questions. Further, the respondents were informed about the ethical regulations regarding the present study, which was declared to involve voluntary participation, that the participation could at any time be cancelled, that all the collected data would be treated confidentially and that anonymity was applied to those who participated.

**General Self-Efficacy Scale.**

General Self-Efficacy Scale (S-GSE) was selected for measuring the personality variable self-efficacy. This scale was developed by Schwarzer and Jerusalem, with the purpose of assessing a person's belief in their own resources, that is, to what degree individuals believe that they are able to reach a goal or handle difficulties with their own ability (Schwarzer & Jerusalem 1995). The Swedish version has been tested and proven to be reliable (Löve, Moore, Hensing, 2012). The questionnaire consists of ten questions that are addressed with a statement for the respondents to answered on a Likert scale; 1 = not at all true, 2 = hardly true, 3 = moderately true, 4 = exactly true. An example of a statement is; “I can always manage to solve difficult problems if I try hard enough”. High scores on the S-GSE scale indicate a high level of self-efficacy. Internal consistency in a sample from 23 nations was α = .76 to .90 (Scholz, Sud, & Schwarzer, 2002). In a normally represented population internal consistency was found to be α = .86 (Rigotti, Schyns & Mohr, 2008). In the Swedish version (by a randomized population; n = 4,027, n = 3,310, and n = 498) internal consistency was α = .90 (Löve et al., 2012). In the present study, internal consistency is α = .87.

**QPS Nordic.**

The Nordic questionnaire (QPSNordic) was used to measure the organizational variables, support from manager, support from co-workers, trust in manager and fair leadership. QPSNordic is constructed to measure psychological and social factors in an organizational context and is designed for research in the relationship between work, health, and productivity (Dallner et al., 2000). QPS is a self-report questionnaire that includes 129 questions, divided into 14 categories with additional subcategories. Each question is
addressed with a question for the respondents to consider on a five-point Likert scale; 1=Very rarely / never, 2= Quite rarely, 3= sometimes, 4 =Quite often, 5= Very often / always. Seven questions from the QPS questionnaire represented the organizational variables in the present study. Examples of the questions are (freely translated from Swedish to English); “if you need, is your manager willing to listen to problems related to your work?” and; “is your manager treating the employees in a fair and equal manner?”. In the normative sample for QPS internal consistency (n=2010) was measured with a Test-retest reliability (n=393) after 8 weeks (Dallner et al., 2000). According to the sample the subcategory support from coworkers found the internal consistency to be $\alpha = .83$, $\alpha = .81$ in the test-retest, and $\alpha = .83$ in the present study. In the subcategory support from manager internal consistency was $\alpha = .80$, $\alpha = .70$ in the test-retest, and $\alpha = .88$ in present study. Trust in manager and fair leadership internal consistency was $\alpha = .75$, $\alpha = .77$ in the test-retest, and $\alpha = .80$ in present study. In the present study, the subcategories support from manager, support from coworkers, trust in manager and fair leadership was added to one variable to represent the organizational factor in the analysis. The internal consistency for this variable was $\alpha = .78$.

**Cognitive appraisals.**

**Construction of the questioner.**

Although numerous studies for the last thirty years is based on the theoretical framework of the Transactional model of Stress (Carpenter, 2015), only five instruments were found, in recent reviews, that measure cognitive appraisals (Carpenter, 2015). It was further shown that those instruments had been sparsely used (Carpenter, 2015), which may implicate that cognitive appraisals of stress mainly have been used as a theoretical framework. Though none of the instruments reviewed by Carpenter (2015) could be found in the timeframe for the present study, a simple questionnaire was constructed to enable an empirical test of the stress appraisals. In the present study, the dimension of the Transactional model of stress is limited to primary appraisals (i.e. challenge, harm, and threat) and linked emotional outcomes (i.e. positive emotions and negative emotions). The construction of the questions was based on the emotions linked to each appraisal in an attempt to catch the different appraisals. According to Folkman & Lazarus (1985), threat appraisals are linked to prospective negative emotions as; worry, fear, anxiety and helplessness. Harm appraisals are as well linked to negative emotions, however, retrospective as; frustrations, disappointment, anger, guilt, sadness, and depression. Challenge appraisals are linked to positive emotions as; confidence, hopefulness, eagerness and exhilaration (Carver & Scheier, 1994; Folkman & Lazarus, 1985). Tree
questions for each appraisal were accordingly created. After the construction of the questions, a pilot was conducted with N=123 nurses. The pilot was web based and created in Google forms, and further distributed in a facebook group for nurses. The research ethics was indeed applied to the pilot study. The purpose of the pilot was to examine the understanding of the questions and to analyze the internal consistency of the sample. None of the respondents expressed that they had any problem understand the questions or expressed any other issues with the questions. Internal consistency for each appraisal showed Threat = 3 item $\alpha = .698$. Harm = 3 item $\alpha = .741$ and Challenge = 3 Item $\alpha = .592$. According to Streiner (2003), an acceptable internal consistency should be between .70 - .90. Hence, one question was erased from the Threat category and one from the challenge category to achieve a more acceptable rate. The analysis after the removal showed Threat 2 item $\alpha =.753$, Harm 3 item $\alpha = .741$, and Challenge 2 item $\alpha =.634$.

**Questionnaire for cognitive appraisal.**

The final questionnaire consists of seven questions, two for Threat appraisals, two for Harm appraisal and two for Challenge appraisal. Each question was measured on a four-point Likert scale; 1 = not at all true, 2 = hardly true, 3 = moderately true, 4 = exactly true. The questions to the appraisals were: Threat; “When there is much to do at work, I experience feeling of anxiety”, “When there is much to do on the work, I feel concern for my health”. Harm; “I feel angry when I think of stressful situations that happened at work”, “I feel frustrated when I think of the days when it was extraordinary much to do at work”, “I’m feeling anxious when I believe that there will be much to do at work. Challenge; “I have a good ability to handle stressful days at work”, “When it gets extraordinary much to do at work, I become sharp and focused”. In the present study, the internal consistency for Treat appraisals was $\alpha = .66$. Harm $\alpha = .80$, and challenge $\alpha = .52$

**DASS-21.**

DASS-21 (Depression, anxiety and stress scale) was used to measure perceived stress and negative stress and emotional outcomes as anxiety. DASS 21 is a 21 item self-report questionnaire designed to measure the severity of the categories Depression, Anxiety, and Stress. The instrument is divided into three categories (i.e. depression, anxiety, and stress) with separate questions for each category. Each question is addressed with a statement for the respondents to consider on a four-point Likert scale; 0 = “Does not apply to me at all”, 1 = “Applies to me to a certain degree, or sometimes”, 2 = “Valid to me to a substantial degree or a large part of the time”, 3 = “Applies to me to a high degree, or most of the time”. Examples
of the questions are (freely translated from Swedish to English); “I had a tendency to overreact to events”, and; “I felt dryness in my mouth”. The final score is calculated by adding up the scores for each category, D=depression, A=anxiety, S=stress. High scores indicate a high degree of depression, anxiety, and stress. In the normative sample for DASS-21, internal consistency was α = 0.84 on the Anxiety scale and α = 0.90 at the Stress scale at (Lovibond & Lovibond, 1995). In present study the internal consistency is α = .78 on the anxiety scale, and α = .91 on the stress scale.

**Design and Analysis.**

In the present study, a quantitative approach was chosen since the hypotheses for the study were based on possible relations between different quantitative variables. Excel and SPSS 19.0 were used for the data analysis. The data from the web-based questionnaire (i.e. Google forms) was downloaded and saved in Excel in order to further the data to SPSS. SPSS was used to check the assumptions for the analyses (Bordens & Abbot, 2002). No missing data was found in the sample. All variables showed agreeable skewness (< 2) and kurtosis (< 2), except for the anxiety variable, thereof all variables were ranked, and then found to meet agreeable skewness and kurtosis. Outliers were screened by using Hoaglin, Iglewicz & Tukey (1986) measure techniques (i.e. the first quartile – the third quartile * 2, 2), where no outliers were found. The assumption of normality was further found to be met, except for the anxiety variable. However, when controlled the P-P plot of regression standardized residuals the errors of the linear regression were normality distributed, and thereof found to meet the assumptions. Finally, the assumption for linear relations was checked by pp-plot and found to be met. The variables further showed intern reliability above α = .70, except for challenge α = .52 and treat appraisals α= .66. A bivariate analysis was then conducted with Pearson’s in SPSS to test the correlation and strength between each variable in the hypothesis. For analysis, the hypothesis 1-14 several simple linear regressions and multiple regressions were conducted. The hypothesis 15-20 was the hypothesis of mediation between variables (i.e. one variable operates through another variable) and was conducted by a four-step approach (Baron & Kenny, 1986). The purpose of this approach is to first establish significant relations between the predicted variable (X), the mediator (M) and the dependent variable (Y). This is conducted by in simple linear regression between each of the variables. However, if a non-significant relation is found in any of the regressions no mediation analysis is possible. A multiple regression is then run with X and M as the predictors and Y as the dependent variable. If the result shows that both X and M still is significant to predict Y, a partial
mediation is found. If X is found to be non-significant and M still significant predict Y a full mediation in found. Moreover, if M is found to be non-significant a non-mediation is found between X and Y. The mediating effect is calculated by β (i.e. the standardized regression coefficients) between X-M times β between M-Y (Baron & Kenny, 1986). Finally, the results of all hypotheses will together with tables and running text also be presented by a pathway diagram to present the path coefficients (i.e. β) of proposed links.

Results

The results from the bivariate correlations between the variables are presented in table 1. The result shows high positive relationship between stress and anxiety, and high positive relationship between threat and stress and threat and anxiety. High positive relationship was further found between threat and harm. The relationship between the organizational factor and challenge was however found to be a weak and non-significant.

Table 1  
Correlations between each variable

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Self-efficacy</td>
<td>-</td>
<td>.32**</td>
<td>-.25**</td>
<td>-.25**</td>
<td>.36**</td>
<td>-.26**</td>
</tr>
<tr>
<td>2</td>
<td>Org.factor</td>
<td>-</td>
<td>-</td>
<td>-.39**</td>
<td>-.42**</td>
<td>.03</td>
<td>-.50**</td>
</tr>
<tr>
<td>3</td>
<td>Threat</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.80**</td>
<td>-.29**</td>
<td>.62**</td>
</tr>
<tr>
<td>4</td>
<td>Harm</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.17</td>
<td>.55**</td>
</tr>
<tr>
<td>5</td>
<td>Challenge</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.24*</td>
</tr>
<tr>
<td>6</td>
<td>Stress</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Anxiety</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (1-tailed).
* . Correlation is significant at the 0.05 level (1-tailed).

The hypotheses H1-H14 was analyzed by simple regressions and multiple regressions depending on the hypothesis and are presented in a pathway diagram in figure 2.

The results of the meditation analysis for hypothesis H15- H20 are presented in the text below and in the pathway diagram in figure 2.

Hypothesis 15 proposes that the challenge appraisals will mediate between self-efficacy, the organizational factor and stress. The result shows a non-mediated effect of challenge between self-efficacy and stress. No mediator analysis was conducted with the
organizational factor then this predictor did not meet the assumption of significant correlation with the proposed mediator (i.e. challenge)

Hypothesis 16 proposes that challenge appraisals will mediate between self-efficacy, the organizational factor, and anxiety. The result shows a non-mediated effect of challenge between self-efficacy and anxiety. No mediator analysis was conducted with the organizational factor then this predictor did not meet the assumption of significant correlation with the proposed mediator (i.e. challenge)

Hypothesis 17 proposes that threat appraisals will mediate between self-efficacy, the organizational factor and stress. The result shows a partial mediation effect of threat between the organizational factor and stress (Then both predictors still have a significant effect). No mediator analysis was conducted with the self-efficacy factor then this predictor did not meet the assumption of significant correlation with the proposed mediator (i.e. threat)

Hypothesis 18 proposes that the threat appraisals will mediate between self-efficacy, the organizational factor, and anxiety. The result shows a full mediation effect of threat between the organizational factor and anxiety (Then the organizational factor no longer is significant). No mediator analysis was conducted with the self-efficacy factor then this predictor did not meet the assumption of significant correlation with the proposed mediator (i.e. threat)

Hypothesis 19 proposes that the harm appraisals will mediate between self-efficacy, the organizational factor and stress. The result shows a partial mediation effect of harm between the organizational factor and stress (Then both predictors still have a significant effect). No mediator analysis was conducted with the self-efficacy factor then this predictor did not meet the assumption of significant correlation with the proposed mediator (i.e. harm)

Hypothesis 20 proposes that the harm appraisals will mediate between self-efficacy, the organizational factor, and anxiety. The result shows a full mediation effect of harm between the organizational factor and anxiety (Then the organizational factor no longer is significant). No mediator analysis was conducted with the self-efficacy factor then this predictor did not meet the assumption of significant correlation with the proposed mediator (i.e. harm)

The results of the regressions are presented by path coefficients (i.e. \( \beta \)) in figure 2, together with mediating effects.
Figure 1. Output pathway diagram that shows the results of the analysis with path coefficients.

The mediating effects are shown in the parenthesis on each mediating pathway where $T$ refers to threat and $H$ refers to harm.

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

**Discussion**

In the present day there is a great problem with stress related illness in organizations that affect organizations as well as employees. Work stress has been the topic of several studies and rapports that have found nurses to be one of the most affected professions (Chen, Fang, & Fang, 2015; Elfering et al. 2006; Freeney & Tiernan 2009). In this regard, proactive factors that may influence nurse’s perception of work stressors are of interest to examine. Given that the nursing profession contains of 90% women (SCB, 2016), this topic is additionally interesting from a gender perspective. The purpose of the study was thereof to examine proactive and malleable factors that may influence nurse’s perception of work stressors. Self-efficacy and grouped organizational factors (i.e. support from manager, support from coworkers, trust in management and perceived fairness) were examined as antecedents.
to the outcome of anxiety and stress via cognitive appraisals (i.e. challenge, threat and harm). This study further examined the mediating role of the cognitive appraisals in the relation between the antecedents and the outcome of stress and anxiety. The direct relation between anxiety and stress and self-efficacy, as well as the direct relation between anxiety and stress and organizational factors were further examined. To get a comprehensive view of suggested relations and underlying mechanisms, the hypothesis was presented by a model. This model was partly built on the System theory which emphasizes that all components should be viewed as an entirety but also as interdependent (Kast and Rosenzweig, 1972), and partly on the Transactional theory that is based on the notion that personal and environmental factors are intertwined and influence how individuals perceive stressors, which are furthered to an emotional outcome (Kiefer, 2005; Probst, 2003).

The sample for the present study consists of 117 nurses and assistant nurses of which 112 were females working at a hospital in southern Sweden. The overrepresentation of women in the sample was expected given that recent data shows that women account for 90% of employees in the professions of nurses and assistant nurses in Sweden (SCB, 2016). To simplify, throughout the discussion both nurses and assistant nurses will be referred to as nurses.

The result showed that self-efficacy and the organizational factor together are significantly related to the cognitive appraisals challenge, threat, and harm. This result implies that self-efficacy and the organizational factor indeed serve as antecedents to cognitive appraisals of stress, where self-efficacy represent the personal antecedent and the organizational factor represent the situational antecedent. However, the result reveals that only self-efficacy is a positively significant factor related to the challenge appraisal, since the organizational factor was found not to be significantly related. The result further show that the organizational factor single handedly is negatively related to the appraisals threat and harm, given that self-efficacy was found not to be related. These findings implies that a nurse with a higher degree of self-efficacy is more likely to perceive a work stressor as a challenge. Furthermore, nurses that experience support from managers, support from coworkers, and trust in the management and perceive fairness at work (i.e. the organizational factor) are less prone to perceive stressors at work as threat or harm. Due to the fact that no significant relation was found between self-efficacy and threat and harm appraisals, nor between the organizational factor and the challenge appraisal, these findings partly contradict previous research that have proposed those relations (Schwarzer, 2014; Lazarus’s, 1999). The essence
of the transactional theory is, however, that there is an interaction and collaboration between the two antecedents (Kiefer, 2005; Probst, 2003). In that sense, the result may be in line with the theory anyway since the antecedents together relate to all of the cognitive appraisals, and hence complete each other. To be added, when running the bivariate analyses, a significant relation was revealed between self-efficacy and the organizational factor, which indicate that there might indeed be an interaction between the antecedents. These findings are supported by Bandura (1999) who state that a person’s degree of self-efficacy mainly is influenced by environmental factors. Empirical studies have also found that self-efficacy could be positively manipulated by environmental factors (McAuley, Talbot, & Martinez, 1999; Turner, Rejeski, & Brawley, 1997). An individual’s degree of self-efficacy may also influence to what extent they perceive their environment as supportive or not, given that individuals are proposed to be the producer of their own social reality (Bless, Fiedler, Strack, 2004). Further, the Social cognition theory bases its notion on triadic reciprocal determinism that refers human function to an interaction between behavioral, personal, and environmental factors (Wood & Bandura, 1989; Crothers, Hughes, & Morine, 2008). This means that an individual’s behavior, feelings and thoughts are influenced by the environment and vice versa. In the context of the results of present study, this may imply that there is reciprocation between nurse’s beliefs in their ability to handle obstacles at work (i.e. self-efficacy) and the perception of environmental support in the workplace (i.e. the organizational factor).

The relations between the cognitive appraisals and the anxiety and stress outcome firstly showed a negative relation between the challenge appraisals and the anxiety and stress outcomes. Considering that the challenge appraisal accordingly is related to specific emotions, this result further implies that positive emotions (i.e. confidence, exhilaration, eagerness and hopefulness) emerge when a nurse perceived a stressor as a challenge, which further reduce the probability of an anxiety and stress outcome. The threat appraisal was also found to be related to the anxiety and stress outcome, however, in a positive manner. This finding suggest that when a nurse perceive a work stressor as a threat, negative emotions are experienced (i.e. worry, fear, anxiety and helpless) that are furthered to an incensement of anxiety and stress. Similarly, harm appraisal was also found to be positively related to perceived stress and anxiety, with negative emotions (i.e. guilt, anger, and frustration) that increase the probability of an anxiety and stress outcome. These findings were expected and are supported by several studies (Hazerbroek et al., 2001; Frijda et al., 1989; Lerner & Keltner, 2000; Roseman et.al., 1990; Smith & Ellsworth, 1985; Zohar & Dayan, 1999; Kelsey & Leitten, 1993).
Additionally, in the bivariate correlations, a quite strong correlation was found between the cognitive appraisals threat and harm. As previously reviewed, both threat and harm represent negative assessments and emotions. However, the difference is that threat appraisals represent assessment of anticipatory possible losses with negative prospect emotions (i.e. worry, fear, anxiety, and helplessness), and harm appraisals represent assessment of retrospective or pass losses (i.e. guilt, anger, and frustration). Since the emotions from both appraisals are negative, they may be correlated, considering the possibility that several negative emotions may occur simultaneously when nurses are facing stressors.

To facilitate a better understanding of the relationships and the underlying mechanisms in the model the cognitive appraisals were examined as mediators between the antecedents and the stress and anxiety outcomes. A mediation effect is also of interest because it shows how much of a direct effect between a predictor and an outcome that is mediated by one other predictor (Baron & Kenny, 1986). Before running a mediation analysis, the relation between the variables was analyzed then a significant relation between the variables is acquired (Baron & Kenny, 1986). Given that significant relations were found between self-efficacy and the cognitive appraisals harm and threat, as well between the organizational factor and the challenge appraisal, non-mediating analysis was executed with these relations. The result shows a fully mediation effect between the organizational factor and the stress and anxiety outcomes by the harm appraisals. Accordingly, the underlying mechanism in this relation is assessment of retrospective or passes losses with negative emotions as guilt, anger, and frustration. The mediation of the threat appraisal was found to partly mediate between the organizational factor and the anxiety outcome as well as the stress outcome. This result revealed that the underlying mechanism in the threat appraisal that represent assessment of anticipatory possible losses with emotions as worry, fear, anxiety, and helpless, account for some of the relationship, however not all.

These findings suggest that that when a nurse perceive to have support from the manager and the coworkers, have trust in the management and perceived fairness at work, less negative emotions (i.e. guilt, anger, and frustration) that are related to retrospective or pass losses emerge when facing work stressors, which further decrease stress and anxiety outcomes. Moreover, a nurse to some extent also perceive less negative emotions (i.e. worry, fear, anxiety, and helpless) that are related to anticipatory possible losses.
The analysis of the mediating of the challenge appraisals between self-efficacy and stress and anxiety showed none mediating effect. This result imply that the challenge appraisal not serve as an underlying mechanism in the relation between self-efficacy and the stress and anxiety outcomes.

Self-efficacy and the organizational factor were also proposed to have a directly relation to the anxiety and stress outcomes. As expected, the result showed that both self-efficacy and the organizational factor have a significant negative relation to anxiety and stress. The relation between the anxiety and stress outcome was also examined and showed, as expected, a significant positive relation, where a high degree of stress is positively related to a high degree of anxiety.

**Methodical discussion and limitation**

The limitations of the present study are firstly causality and validity problem with the self-constructed instrument for cognitive appraisals. Suspected shared variance was found between the threat and harm appraisal \((r = -.80, p = < .001)\), which indicates that the variables may measure the same construct then these variables are closely related. Some of the questions constructed to measure the cognitive appraisal were found to be closely related to some of the questions regarding self-efficacy, therefore a shared variance may exist. The internal consistency for two of three scales on the instrument for the cognitive appraisals was further found to be low (i.e. threat appraisals \(\alpha = .66.\) and challenge \(\alpha = .52\)). Overall, the instrument for cognitive appraisal was newly constructed, meaning that both the validity and the reliability were considered to be low. Self-efficacy was measured using an instrument that measures a general self-efficacy. However, self-efficacy was initially conceptualized as a domain and situation specific construct then individual’s possess different strength of self-efficacy depending on the domain or situation (Bandura, 1997; Schwarzer & Jerusalem, 1995). Although the instrument is found to have a high reliability, the fact that the instrument was used to measure self-efficacy in a work context, this may indicate a lower validity. In the same line, there is a great risk that individual’s general levels of stress or anxiety affect their answers, which may influence the validity and possible causation. The survey was further answered by the participants during work hours, which may further be a threat to the study’s validity. Validity could additionally be threatened by external matters such as private issues and events and/or recently changes at work (Rogelberg, 2008). Although the study is based on a model with assumed directions of proposed relations between the variables, any causal assumptions of the relations should be made with caution. A comprehensive view is instead
suggested, given that the study is built on a theoretical framework that advocates a holistic approach where all components affect each other, and further that each construct in the stress process may manifest itself as either antecedent, appraisal or as outcome (Lazarus, 1991).

**Future research**

The results from the present study showed that both self-efficacy and the organizational factors play a significant role in nurse’s perception to work stress. Moreover, that the cognitive appraisals threat and harm are important underlying mechanism in nurse’s perception of work stress. These factors have been found to be malleable, justifying proposing an intervention designed to increase self-efficacy and the organizational factors. Such an intervention may affect nurse’s perception of their working environment and their belief in their own capacity to face difficulties at work, which may result in reduced anxiety and stress outcome and further benefit the individual as well as the organization. The second suggestion is to further develop a valid instrument for cognitive appraisals of stress in a context of healthcare workers. The knowledge of cognitive processes and emotions may provide a better understanding in the interpretation and assessment of stressors. Cognitive appraisals could further help explaining the underlying mechanisms in the stress process.

**Practical implications**

These findings suggest that a holistic view should be employed regarding nurse’s perception of work related stressors since individual’s behavior, perception, feelings and thoughts are found to be influenced by the environmental factors, and vice versa. Program or training with the purpose to reduce work related stress and ill-health among nurses are therefore suggested to target the pathways of both antecedents (i.e. self-efficacy and the organizational factor), with an emphasis on the cognitive appraisals threat and harm, since emotions related to those appraisals are suggested to function as underlying mechanisms in the relation between the organizational antecedent and the stress and anxiety outcome. Since the antecedents are found to be malleable, it is most relevant to suggest interventions that are aimed to increase self-efficacy and to improve the organizational factor. Suggestively, using mentors in order to increase self-efficacy, whom can function as social models that share their perspectives, values, and expertise, as well as give positive feedback, can accordingly boost the individual’s beliefs in their own capability, and thus strengthening the degree of self-efficacy (Bandura, 1977). The usage of mentors has previous been tested with good result in the attempt to increase self-efficacy in a work context (Frayne & Latham, 1987; Gist, 1989; Gist et al., 1989; Zoeller, Mahoney, & Weiner, 1983). Intervention involving training leaders to develop a transformational leadership style could also be advantageous since this
leadership style is found to have the ability to increase confidence and trust among co-workers and to positively influence the feeling of belonging to a group, and thus may improve the organizational factor (Conger & Kanungo, 1998; Shamir, House, & Arthur, 1993).

**Conclusion**

Self-efficacy and the organizational factor are both significantly related to nurse’s perception of work stress and are also together related to the cognitive appraisals of stress. Moreover, self-efficacy is related to the challenge appraisal. The organizational factor is related to the cognitive appraisals threat and harm, which further was found to mediate between the organization factor and the anxiety outcome. These findings furthermore indicate that emotions related to those appraisals function as underlying mechanisms in the relation. The cognitive appraisals were also found to relate to the anxiety and stress outcome. The overall result suggest that several elements work together in a triadic way, where an individual’s behavior, perception, feelings and thoughts are influenced by the environment and vice versa. This implies that there is a reciprocation between nurse’s beliefs in their ability to handle obstacles at work (i.e. self-efficacy), their perception of environmental support in the workplace (i.e. the organizational factor), and by which emotions they appraise a situation (i.e. cognitive appraisals). Thereof a holistic view of the result is suggested, given that the individual's own belief to handle difficulties and perception of environmental support is shown to be equally important in the relation to anxiety and stress outcome. Additionally, this study contributes to the field of work stress in a healthcare context, as well as to a gender perspective since 95% of the respondents in this study were women.

**References**


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