

The Role of Work Engagement as Moderator of Perceived Stress toward Innovative Work Behavior

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Abstract

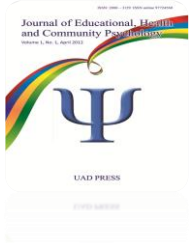
Previous studies stated that innovative work behavior is negatively affected by perceived stress and positively correlated with work engagement. Work engagement plays an essential role in reducing the effect of perceived stress. This study aims to determine the moderating role of work engagement between perceived stress and innovative work behavior. This research is cross-sectional non-experimental quantitative research. Data were collected among 263 healthcare workers using IWB-9, PSS-10, and UWES-9 as instruments. The data were analyzed with moderation using Hayes's PROCESS program on SPSS Statistics v22.0.0. This study showed that Work Engagement has no significant role as a moderator on the effect of Perceived Stress on Innovative Work Behavior ($t = .14$; $p = .89 > .05$) on healthcare workers. The findings also implied that the negative antecedent variables do not affect innovative work behavior; therefore, the following studies should examine other positive variables on innovative work behavior.

Keywords: *healthcare workers, innovative work behavior, moderation, perceived stress, work engagement*

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Introduction

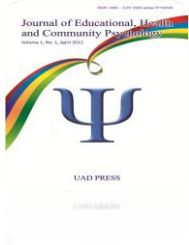
De Jong & Den Hartog (2010) stated that the ability to innovate the services, work processes, and products is a crucial factor for organizations for long-term sustainability and success in the business. This statement also applies to the healthcare sector, which experiences the impact of these technological developments and innovations. Healthcare is related to the welfare of society, which will impact regional autonomy. Therefore, the government must pay special attention to improving innovative, affordable, and better-quality healthcare services in its healthcare facilities (Alkano, 2016). Herzlinger (2006) added that healthcare services that need attention are not only limited to the quality of patient care but also in terms of technology and the business model of the healthcare facility. Innovations in those fields will support healthcare services to be more comfortable, effective, and affordable for patients (Herzlinger, 2006).



Regarding technology, the changes in healthcare services happen in how consultation and treatment are carried out. It goes from being done traditionally to digitally nowadays, for example, by providing big data analysis and the internet of things (IoT) so the patient examination process can be more effective and efficient. The existence of sophisticated programs such as artificial intelligence (AI) in several healthcare institutions in developed countries is also an example of technological innovation in the healthcare sector to improve quality and increase the speed of giving healthcare services (Media Indonesia, 2022). Indonesia is one of the countries that continue to make efforts to improve the quality of healthcare services for its people to achieve national independence in healthcare treatments. Indonesia's Director-General of Healthcare Workers stated that Indonesia needs much innovation in the healthcare sector, not only in terms of medicines and medical devices but also in innovative programs and the quality of the healthcare services provided (Media Indonesia, 2022).

The healthcare facility management's business model also determines the quality of healthcare services. Parasuraman, Zeithaml, and Berry (1988) explained that service quality could be measured by five aspects; tangible, reliability, responsiveness, assurance, and empathy. Tangible refers to health equipment and infrastructure, including advanced technology, equipped facility, and comfort in hospitals. This aspect also includes the appearance of healthcare workers when treating patients. Reliability means healthcare workers' ability to effectively and accurately provide healthcare services. Responsiveness refers to how quickly healthcare workers respond to serving patients. Assurance refers to healthcare workers' competence, credibility, or reputation while providing services. Empathy can be measured by communication between healthcare workers and by understanding the patient's condition. Innovations in the health sector aim to improve these five aspects in patients.

Innovation is a process, result, and final product inseparable from individual efforts, starting from creating new ideas, promoting them, and implementing them in the form of solid acts as a solution when solving problems (De Jong & Den Hartog, 2010; Janssen, 2000). Not only owned by the organization, but innovation is also essential for the organization's members as the creator and executor of innovation. The ability to innovate within the individual is called innovative work behavior (De Jong & Den Hartog, 2010; West & Farr, 1990). Innovation is an idea, and the individual is the



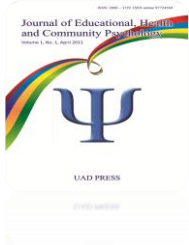
executor capable of generating, executing, developing, and modifying innovative ideas (Scott & Bruce, 1994; Janssen, 2000; Etikariena & Muluk, 2014).

Innovative work behavior refers to managing the ability to create new and productive ideas related to job demands at work (Scott & Bruce, 1994; Janssen, 2000). Innovative work behavior is defined as creating ideas, introducing or promoting, and implementing new ideas that will benefit the group and organizational performance (De Jong & Den Hartog, 2010; Tidd, Bessant, & Pavitt, 2001; Janssen, 2000; Scott & Bruce, 1994). Getz and Robinson (2008) argued that most innovative ideas come from individuals, approximately 80%, and the other 20% arise from organizational initiatives.

Innovative work behavior is considered one of the keys to innovation and organizational effectiveness. This statement also applies to individuals who work in public healthcare services, often referred to as healthcare workers. A healthcare worker is a person who devotes himself and has knowledge and skills obtained by having specific education in giving healthcare treatments (UU Tenaga Kesehatan No. 36, 2014). Healthcare workers are categorized into general and specialist practitioners, nurses, pharmacists, radiologists, epidemiologists, physical therapists, nutritionists, and other healthcare workers.

In healthcare, innovative work behavior can emerge as a progressive adaptation of existing healthcare products, services, or procedures or as entirely new practical solutions (Chang & Liu, 2008). Innovative work behavior can be resulted from adopting or developing existing processes, products, or ideas relevant to tasks or work units, not only creating a novel idea (De Spiegelare, 2014). Asurakkody and Shin (2018), in their conceptual analysis of innovative work behavior in the nursing context, defined innovative work behavior as generating new ideas and trying to implement them confidently to overcome challenges. The behavior, such as adopting or producing procedures, treatment strategies, or policies to have a more effective way to promote health in patients or clients (World Health Organization, 2022).

Innovative work behavior among healthcare workers lies in the awareness and initiative to augment knowledge to enrich more efficient treatment strategies and procedures (Kimble & Massoud, 2016).



Knowledge-sharing activities that are useful for avoiding mistakes tend to occur more frequently in healthcare workers with a high tendency to innovative behavior (Afsar, 2017). West and Wallace (1991) stated that doctors, therapists, and nurses must learn to adapt quickly to modern standards and apply the latest procedures to ensure adequate healthcare services.

Patterson et al. (2009) also said that several factors influence the emergence of the innovation process in organizations, namely the social environment, job design, and the organization itself. Teamwork, leadership style, and support from colleagues and superiors, such as providing constructive feedback, are included in the social environment factors that can influence the emergence of innovative work behavior. Hasanah et al. (2019) stated that work resources and demands correlate with innovative work behavior. From the two antecedents, work resources are the better predictor of innovative work behavior.

Kessel, Hannemann-Weber, and Kratzer (2012) stated that innovative work behavior carried out by healthcare workers would be beneficial for improving the overall functioning of healthcare organizations and achieving more useful practical solutions for each patient treatment. For example, a doctor in the East Java region proposed an additional prehospital emergency service program by establishing an ambulance service that focuses on emergencies outside the hospital to minimize the risk of death due to accidents that often occur in the area (Jawa Pos, 2022). This implementation then impacts increasing the chances of life for the accident victims because of the faster treatment, which will increase the trust of the residents in the hospital.

The healthcare sector nowadays faces challenges in terms of increasing retirement or resignation of healthcare workers, increasing number of elderly patients and patients with new types of diseases, and cost efficiency, combined with expectations for quality services and advanced medical technology (Afsar, 2017; Thakur, Hsu, & Fontenot, 2012; Länsisalmi et al., 2006). Therefore innovative work behavior is needed to maintain balance in the hospital so that it can provide more comfortable and effective services to patients by making the most of available resources (Saleem et al., 2015; Kumar, 2011). Healthcare workers with innovative behavior can quickly respond to patient needs, provide appropriate services, and propose new, more effective procedures or methods (Afsar, 2017; Chang

& Liu, 2008) that can improve service quality. Chang and Liu (2008) added that improving the quality of health services will also increase patient safety and satisfaction, making the hospital where the healthcare workers work more trusted by the community and increasing its long-term success.

However, innovative work behavior cannot always emerge, especially in the healthcare sector. Several characteristics influence the emergence of this innovative behavior in healthcare workers, such as the organization's characteristics, the work environment, and the individuals themselves (Asurakkody & Shin, 2018). Länsisalmi et al. (2006) stated that innovation in healthcare workers is positively related to leadership characteristics, task orientation, common goals of individuals and organizations, proper timing, members' motivation to participate, opportunities to express opinions, sufficient resources, and no stress. Afsar (2017) added that healthcare workers, especially nurses, will tend to display behavior when adjusting the values they hold in common with the objectives of the healthcare institution, including the opportunity to innovate. This disclosure is in line with the four levels of innovation in organizations mentioned by Miner (2010). Healthcare workers already have standard operating procedures (SOP) that make it challenging to have revolutionary innovation. Based on Miner's (2010) categorization, healthcare workers can only do innovations in the first to second levels, such as adding features or developing existing programs or procedures (Kimble & Massoud, 2016; Herzlinger, 2006). Doctors are likely to have a higher chance of displaying innovative behavior by proposing new ideas or strategies related to treatments and medication for patient illnesses based on relevant knowledge (Asurakkody & Shin, 2018; Chang & Liu, 2008). While nurses tend to be able to do innovations at level one, such as sharing knowledge for the best setting up intravenous infusion procedures with minimum pain based on relevant experience and knowledge (Kimble & Massoud, 2016; McSherry & Douglas, 2011).

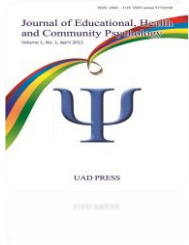
Perceived Stress and Innovative Work Behavior

Stress is said to be one of the factors that influence the tendency for the emergence of innovative behavior among healthcare workers (Afsar, 2017). Job stress can significantly impact the health of healthcare workers, including reducing their tendency to behave innovatively in the workplace (Anjum & Zhao, 2022). Lazarus and Folkman (1984) defined stress as a person's judgment about himself and the surrounding environment, which is considered to be beyond his capacity and has the

potential to endanger his well-being. Then, Phillips (2013) added that each individual tends to assess themselves and their surroundings differently. In other words, the same event can impact each individual who experiences it differently. This difference in perception and reaction is called perceived stress, defined by Phillips (2013) as a person's thoughts or affection for how much stress they experience at a particular time or during a specific period. Perceived stress, according to Lazarus and Folkman (1984), does not solely assess stressful situations but also assesses the degree to which everyday situations would be considered stressful. Perceived stress incorporates feelings about losing control and uncertainty about one's life, how individuals deal with troublesome daily problems, how many changes will be experienced, and confidence in their ability to live their lives (Phillips, 2013; Lazarus & Folkman, 1984).

Stressful minds cannot work well with innovative behavior (Probst et al., 2020; Niesen et al., 2018; Niesen et al., 2017; De Spiegelaere et al., 2014), so it is essential for healthcare workers to display innovative behavior while controlling the stressful tendencies on daily. According to Anderson and Pulich (2001), this situation is quite tricky for healthcare workers to carry out because the health sector is one of the workplace environments with high-stress levels. Chang et al. (2006) described healthcare facilities as the most conflicting work environment because it is an environment with various fields of the healthcare profession that gather in one place and must be able to work together well. The demands for efficient time management, the ability to use various medical devices, and the need to keep interacting with many people can be significant sources of distress if not managed properly (Anjum & Zhao, 2020; Erebak, 2016; Chang et al., 2006).

The intensity of each healthcare worker's stress varies, depending on the type of profession and their respective workload. Nevertheless, Saleem et al. (2015) identified that long working hours and lack of resources will create the same stressful situation for the entire workforce and can impact individual health and commitment to work. Healthcare workers must not only be aware of the risk of fatigue due to a high workload but also must be able to overcome the fear of contracting and transmitting the disease to their patients (Liu et al., 2020). This perceived stress can lead to a feeling of pessimism and helplessness that hinders healthcare workers from carrying out their duties optimally (Anjum & Zhao, 2022; Zhang et al., 2021).



Healthcare workers who feel stressed tend to be unfriendly, easily offended, have high job dissatisfaction, decreased work commitment, and have burnout and a high chance of turnover (Abushaika & Saca-Hazboun, 2009). Schaufeli and Taris (2014) also argued that the main component of burnout as the most extreme result of work stress is excessive and long-time work demands exceeding individual capacity, which can burden the individual, causing fatigue. This condition causes individuals to withdraw from their job responsibilities and hinders the emergence of innovative behavior from emerging (Maslach & Leiter, 2016; Schaufeli & Taris, 2014). An unfriendly attitude and loss of concentration, as an example of burnout, will reduce the quality of services provided and cause complaints of dissatisfaction from patients (Vahey et al., 2004). Feelings of being easily offended to the tendency to behave aggressively also increase the risk of experiencing conflict with coworkers (Erebak, 2016).

Distress also interferes with individual health, reducing concentration and ability to solve problems calmly (Kushal et al., 2018). Healthcare workers will be hasty, which can lead to medical errors in determining patient treatment. In addition, excessive stress can also affect healthcare workers' judgment ability, resulting in a longer decision-making process and leading to errors in patient prioritization (De Hert, 2020; Shanafelt et al., 2010). This situation can enhance the risk of death for the patients. This assertion is in line with the study by Saleem et al. (2015) and Anjum and Zhao (2022) that excessive stress levels will reduce productive and innovative behavior. If not addressed immediately, this situation will harm the quality of service and the effectiveness of healthcare institutions.

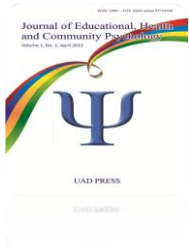
The discussion of stress with a transactional perspective state that stress emerges from interactions between individuals and their surroundings, so the intensity of stress will depend on the individual's adaptation to their surroundings (Folkman & Lazarus, 1988a, 1988b). Therefore, perceptions and appraisal of the current situation will also influence stress intensity (Erebak, 2016; Lazarus & Folkman, 1984). Work experience, social support from colleagues and supervisors, self-efficacy, each individual's confidence in his locus of control, and differences in personal hostility towards sources of stress are also part of determining the stress intensity (Robbins & Hakim, 2013).

Work Engagement and Innovative Work Behavior

Healthcare workers' motivation to contribute more and show more enthusiasm at work is called work engagement (Sari, Yudianto, & Sinambela, 2020). Bargagliotti (2011) also defines a similar thing in work engagement as the state of self and individual thoughts that are positive and satisfied with their work, characterized by passion or enthusiasm, dedication, and feelings of enjoying work or absorption. Healthcare workers with high work engagement are said to be more enthusiastic and friendly when providing services to their patients (Lowe, 2012; Eisenberg et al., 2001). Bargagliotti (2011) said that healthcare workers would be motivated, absorbed, and dedicated to providing convenient and cost-efficient patient services. High working hours and the workload of caring for patients do not trouble them to complete their work agilely, safely, and cost-efficiently when healthcare workers feel attached to their work (Bargagliotti, 2011). They have a positive view of their work, stimulating their desire to make more innovative contributions.

Work engagement is reported to have a suppressive effect on the emergence of stress (Wang, Zhang & Chun, 2021). Wang et al. (2021) also said that work engagement combined with stress at a certain level would help increase innovative work behavior among employees. Halbesleben (2010) said that work engagement has a negative correlation with job demands which can lead to stress and burnout. Employees who are engaged in their work, characterized by high enthusiasm, dedication, and focus, can show good work performance and manage stress in the workplace well (Christian et al., 2011). Individuals with high work engagement will tend to be more open to new ideas hence more creativity and tendencies to display innovative behavior when performing their duties (Gawke et al., 2017; Orth & Volmer, 2017). They will perceive stressful conditions as challenging, not threatening, to be avoided (Bakker & Albrecht, 2018).

In line with this, work engagement was found to have the ability to increase individual initiative attitudes related to behavioral innovations in the form of new actions or approaches in carrying out their work (Orth & Volmer, 2017; Hakanen, Perhoniemi, & Toppinen-Tanner, 2008). An increase in the personal initiative was also found as a result of work engagement which could predict a work unit's perception of innovation (Hakanen et al., 2008). Personal initiative differs from absorption in work engagement because personal initiative means innovation in behavior in the form of new actions or approaches (Bargagliotti, 2011). In contrast, absorption refers to a feeling of being immersed in



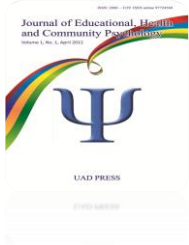
work. Studies show that individual initiative is related to idea generation, entrepreneurial success, and innovation behavior (Binnewies et al., 2007; Frese et al., 1999).

The linkages between these variables make researchers want to see whether work engagement can be a moderator to weaken the effect of perceived stress on the emergence of innovative work behavior in healthcare workers. There is no empirical research that examines this matter. The previous study examined the effect of perceived stress on innovative work behavior (Saleem et al., 2015). Meanwhile, Anjum and Zhao (2022) studied the effects of work stress on innovative work behavior in medical healthcare professionals. Bani-Melhem et al. (2020) also examined the effect of work stress on innovative work behavior with different samples. Work engagement correlates with innovative work behavior (Sari, Yudianto, & Sinambela, 2020; Bargagliotti, 2011). However, few studies have been conducted on these three variables simultaneously, especially in healthcare workers. Wang, Zhang, and Chun (2022) conducted a study on the effect of stress on innovative work behavior, with work engagement having a suppressive effect on work stress felt by employees. This study wanted to see the role of work engagement between perceived stress on innovative work behavior among healthcare workers. Therefore, the research question in this study is, “could work engagement moderate the effect between perceived stress and innovative work behavior?”

Method

Overview of Method and Data Collection

The type of this study is explanatory applied research because this study aims to explain work engagement as a moderator that influences perceived stress on innovative work behavior in healthcare workers. This study has a quantitative research design that is cross-sectional and non-experimental. Data collection was using a self-completed online survey method via a google form distributed through various social media, such as WhatsApp, Instagram, and Twitter. This research also passed the ethical community at the Faculty of Psychology at the University of Indonesia with numbers 088/Fpsi.Komite Etik/PDP.04.00/2022.



Sampling

This study used a non-probability sampling technique with a convenience sampling method because researchers selected participants based on individual willingness and ability to become participants (Gravetter & Forzano, 2012). Criteria are determined so that the sample characteristics do not deviate from the population (Notoatmodjo, 2010). This study focused on male and female healthcare workers with a minimum age of 20 years old, preferably healthcare workers who interact directly with patients and have tenure for at least one year. The minimum number of samples was determined using the Lemeshow formula (1990) using a standard distribution value with a 95% confidence level, the proportion of healthcare workers in Indonesia (.21%), and an error tolerance of 5%.

Instruments

The google form consists of five parts: a cover letter, informed consent, respondent's identity related to participant demographic information, measurement tools used (IWB, UWES-9, PSS-10), and a closing statement. Participants must fill in all sections without exception; they cannot continue to the next page if there are sections that have not been filled in. Each measuring instrument has different instructions and scale ranges.

The IWB scale is a measurement tool that measures individual innovative work behavior developed by Janssen (2000) and adapted into the Indonesian version by Etikariena and Muluk (2014). The IWB scale has good reliability (Kaplan & Sacuzzo, 2005; Ghozali, 2011) of .970 with nine items using a Likert scale of 1-6 (1=never do it at all, 2=do it occasionally, 3=begin to do it quite often, 4=rather often, 5=almost always, 6=always do). Each of these items is part of a dimension, namely Idea Generation, Idea Promotion, and Idea Realization but is analyzed unidimensionally because the three dimensions are strongly correlated. Table I shows examples of items of the IWB scale.

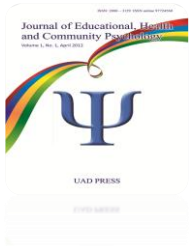


Table 1

Example of Items in the IWB scale

Dimension	Item
<i>Idea generation</i>	“Searching out new working methods techniques or instruments.”
<i>Idea promotion</i>	“Acquiring an approval for innovative ideas.”
<i>Idea realization</i>	“Evaluating the utility of innovative ideas.”

PSS-10 is a unidimensional measurement instrument developed by Sheldon Cohen, Kamarck, & Mermelstein (1983) to measure individual stress perceptions. One item must be dropped from the PSS-10 because it has a CRIT value $\leq .30$ after the researchers conducted a trial (Nunnally & Berstein, 1994; Azwar, 2012). Therefore, the PSS-10 used in this study has a total of nine items consisting of five favorable and four unfavorable items with a reliability score of .860. PSS-10 uses a Likert-type scale with a range of 0 (never) to 5 (very often). Table II shows examples of items of PSS-10.

Table 2

Example of Items in PSS-10

Type of Item	Item
<i>Favorable</i>	“In the last months, how often have you been upset because something happened unexpectedly?”
<i>Unfavorable</i>	“In the last month, how often have you felt confident about your ability to handle your personal problems?”

UWES-9 is a unidimensional measurement instrument developed by Schaufeli & Bakker (2006) to measure work engagement. UWES-9 has a total of nine items with a reliability of .859, consisting of three correlated dimensions: vigorous, dedication, and absorption. UWES-9 uses a Likert-type scale with a range of values from 0 (never) to 6 (every day). Table III shows examples of items in UWES-9.

Table 3

Example of Items in UWES-9

Dimension	Item
<i>Vigour</i>	“When I get up in the morning, I feel like going to work.”
<i>Dedication</i>	“My job inspires me.”
<i>Absorption</i>	“I am immersed in my work.”

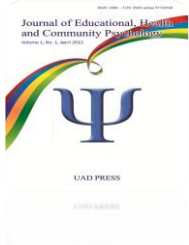
Data Analysis

This study uses several analytical methods to obtain descriptive statistics in the form of participant demographics, the correlation between variables, and research hypothesis testing. All analyses are using the IBM SPSS Statistics v22.0.0 application. The researchers performed correlation testing twice to test the correlation between the main variables and the correlation test between the primary and demographic variables. Correlation analysis between the main variables is using Pearson Correlation analysis. Correlation testing between the primary and demographic variables using point biserial for gender and marital status and one-way independent ANOVA on the profession variety, age, and years of service. To test the hypothesis is done by moderated analysis regression test using the SPSS application with Hayes’s PROCESS model 1.

Result

Demographic Information

The total number of healthcare workers who filled out the research questionnaire is 268. However, five people stated unwillingness on the informed consent to become participants, so 263 participants would be analyzed in this study. Most of the participants of the study were women (71%) with marital status married (85%). The age category in this study was classified based on the career stage of healthcare workers (Goštautaitė et al., 2020); namely, individuals aged <31 years were at the beginning of their career (early), 31-56 years were in the middle of a career, and aged 57 years and over entering a late-career period. This study consisted of healthcare workers mainly in the middle



age of their career (79%), followed by healthcare workers at the early age of their career (19%), and at least in the advanced career age (2%).

The healthcare workers who were participating had quite a variety of working periods, categorized into three groups (Vilela & Casado, 2021), namely less than two years as a period of establishment, 2-10 years as a period of advancement, and more than ten years as maintenance period. A total of 155 (59%) healthcare workers were in the maintenance stage, followed by 97 (37%) healthcare workers in the advancement stage and the other (4%) in the establishment period. The healthcare workers who were participating had the most professional fields, namely, nurses (86%), followed by general practitioners (9%), specialist doctors (2%), and other healthcare professionals (3%), such as pharmacists and medical devices technicians.

Correlation between Variables

Table IV shows the correlation test results between the main variables and demographic variables. Based on table IV, innovative work behavior and genders are negatively correlated, even though the strength of the correlation is weak. Variable age (20%) and years of service (14%) have a large effect size on innovative work behavior. Type of profession has the largest effect size number amongst other demographic variables on perceived stress (19%), although age and years of service have a relatively large effect on perceived stress. This finding indicates that the type of profession, years of service, and age correlate with perceived stress in healthcare workers. Type of profession also has the largest effect size (31%) on work engagement compared to age (6%) which has a medium effect, and years of service (3%) which has a small effect size. This result means that the category of the professional field in healthcare workers correlates with work engagement better than age and years of service.

Table 4
Correlation between Main Variables and Demographic Variables

Research Variables	Correlation				
	Age***	Gender	Profession***	Years of Service***	Marital Status
Innovative Work Behavior	.197	-.174**	.112	.137	.093
Perceived Stress	.159	.037	.186	.171	.108
Work Engagement	.059	.053	.307	.030	-.078

* correlation with point biserial analysis, significant on .05 level (95%)

** correlation with point biserial analysis, significant on .01 level (99%)

*** correlation with one-way independent ANOVA; eta squared .01 = small size effect; .06 = medium effect size; .14 = large effect size

Table V shows the correlation between the main research variables. Based on the results, there is no significant relationship between perceived stress and innovative work behavior. This finding means that perceived stress does not correlate with innovative work behavior in healthcare workers.

Table 5
Correlation between Main Variables

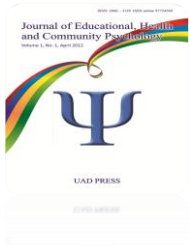
Variables	Innovative Work Behavior	Perceived Stress
Perceived Stress	.006	1
Work Engagement	.343**	-.309**

** Correlation with Pearson Correlation analysis, significant on .01 level (2-tailed)

Table V also shows a significant positive relationship between innovative work behavior and work engagement. This positive relationship indicates that the more engaged healthcare workers are with their work, the tendency for them to display innovative behavior also increases. There is also a significant negative correlation between work engagement with perceived stress. This result indicates that the higher the tendency of healthcare workers to perceive their work situation as stressful, the lower the work engagement of these healthcare workers in their jobs.

Hypothetical Testing

From the hypothesis testing with moderation analysis, there is no moderating effect of work engagement on the effect of perceived stress on innovative work behavior. Therefore, the hypothesis

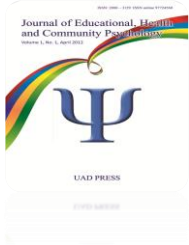


of this study is not supported by the data ($t = .14$; $p = .89 > .05$; LLCI: $-.0303$; ULCI: $-.0349$). This finding implies that there is no effect of the interaction of perceived stress and work engagement on innovative work behavior.

Discussion

This study has all types of healthcare workers as participants, mainly nurses (86%). Healthcare workers have an essential role in increasing innovation in the healthcare sector during the industrial revolution 4.0, characterized by rapidly developing technology. The International Council of Nurses in 2009 revealed that innovation in the health sector, especially nursing, which interacts more with patients, is needed to promote health preventive measures and healthy lifestyles so that risk factors for deteriorating health conditions can be minimized and avoided (Kessel et al., 2012; Asurakkody & Shin, 2018). However, innovation is considered difficult to implement for healthcare workers because there are already existing procedures for providing treatment and care to patients.

Miner (2010) divides the level of innovation into four levels, starting from the first level, marked by minimum innovative actions and a low level of risk in implementation, to the fourth level, with a revolutionary innovation that will produce new products with a high level of implementation risk as well. Healthcare workers, especially doctors and nurses, are considered not to have the opportunity to carry out revolutionary innovations in their work environment. This situation happens because healthcare workers already have functional tasks and absolute procedures related to patient care for which they are responsible. This condition causes doctors and nurses to be unable to perform revolutionary innovations as healthcare workers. However, these SOPs or guidelines are related to doctors' and nurses' tendencies to behave innovatively (Asurakkody & Shin, 2018). This argument is because doctors and nurses will get complete knowledge and information related to their work procedures which can prompt them to generate new ideas or concepts that are more effective and implement these ideas in the treatment procedures. Even though it does not generate new ideas or procedures, developing and modifying these procedures has been said to be innovative behavior to increase work productivity (Afsar et al., 2017). Therefore, innovation in healthcare workers can only



be performed at the first and second levels related to modifying and developing existing products and procedures.

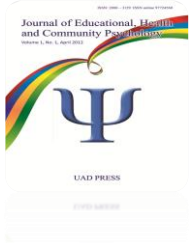
This study provides an overview of innovative work behavior in healthcare workers, showing results mostly in medium and low ranges. This result is presumably because of the difficulties healthcare workers, especially nurses, have in obtaining the opportunities to do innovation at their workplace. As Asurakkody and Shin (2018) mentioned, innovative behavior can be predicted by various factors, one of which is organizational characteristics. Al-Omari et al. (2019) stated that organizational conditions, such as a supportive climate and position at work, will influence the emergence of innovative work behavior. Innovation has a risk factor when implementing new ideas because it is related to changes, usually reducing the desire to innovate because individuals tend to protect themselves and their work (Glynn, 1996). Therefore, showing innovative behavior requires an intervention of job positional power (Krause, 2004 in Asurakkody & Shin, 2018). Certain job positions can give individuals the power to mitigate the risk of failure of a new idea or procedure to increase the efficiency of an existing procedure. Because of this, innovative behavior is said to be more appropriate for nurses and healthcare workers who have positions in the organization and contribute directly to increasing organizational effectiveness, such as managers, leaders, heads of nurses, et cetera. Meanwhile, in this study, most participants were practical nurses with even less power than doctors to do innovations.

In addition, it turns out that examining perceived stress on healthcare workers (doctors and nurses) cannot obtain the overview effect on the emergence of innovative work behavior in healthcare workers, even after being associated with work engagement. Therefore, it is necessary to consider other positive variables, such as organizational support, leadership and supervisory roles support, personality factors, et cetera, to increase innovative behavior in healthcare workers. Thus, the researchers advise future research to examine these positive variables. Another reason this research cannot give out an overview of a high score on innovative work behavior of healthcare workers is that this study has general criteria for the participant by not providing more strict criteria on the job position. Many of the healthcare workers who participated in this study were only healthcare practitioners without having other job roles related to directly increasing the effectiveness of

healthcare institutions. This situation made the doctors and nurses have minimal opportunity to display innovative behavior in the work environment when they answered the questionnaire based on their actual work situation.

The study by Saleem et al. (2015) found that perceived stress negatively affects innovative work behavior in healthcare workers. However, this has not resulted in this study, which shows no effect of perceived stress on innovative behavior. The sampling of general healthcare workers as participants in this study could be one of the reasons this study gave different results. Saleem et al. (2015) had a sample of 100 doctors in a hospital. Physicians are said to have more flexibility and bigger opportunity to innovate (second level of innovation) because of their broader scope of knowledge and authority compared to nurses with their more practical duties. The difference in setting the criteria and determining the sample is a limitation of this study and should be considered when conducting further research. This limitation might also be the cause of the invisible moderating role of work engagement on the effect of perceived stress on innovative work behavior. Studies (Saleem et al., 2015; Anjum & Zhao, 2022) reported that perceived stress influences the innovative behavior of the healthcare workers that did not happen in this study; accordingly, the work engagement cannot strengthen or weaken this effect.

This study showed a positive and significant correlation between work engagement and innovative work behavior. It is in line with the argumentation of Al-Omari et al. (2019), which states that work engagement is a factor that has a positive relationship with innovative work behavior. Innovative work behavior tends to be more visible in workers who feel attached and dedicated to their work (Aryee et al., 2012). Based on this, it is assumed that increasing work engagement will prompt innovative behavior tendencies in healthcare workers. Healthcare workers with high work engagement are expected to be more open to new ideas and knowledge, so their level of creative and innovative behavior will accordingly increase when performing their duties. They tend to perceive a stressful situation as challenging, not threatening, to avoid (Gawke et al., 2017; Orth & Volmer, 2017; Bakker & Albrecht, 2018). Providing adequate resources at work to reduce workload, such as the relationship between colleagues and supervisors of the nurse, can increase work engagement in healthcare workers. This assertion follows the opinion of Bakker and Demerouti (2008) that social



support from the work environment, such as feedback and knowledge-sharing, can make healthcare workers feel enthusiastic and appreciate their work. Because the presence of job resources can reduce the job demands of healthcare workers, and resources can also predict the emergence of innovative work behavior (Hasanah et al., 2019).

This study showed a negative correlation between genders and innovative work behavior. Male healthcare workers display more innovative behavior than female healthcare workers. This finding aligns with the research by Luksyte, Unsworth, & Avery (2017) that innovative work behavior is stereotypically attributed to men than to women. Innovative work behavior is viewed as a masculine activity because it is a risky endeavor consisting of taking the initiative and promoting change (Luksyte et al., 2017; Wu, Parker, & de Jong, 2014; Parker & Collins, 2012; Janssen et al., 2004). However, the correlation found in this study is weak. Age and years of service correlate significantly with innovative work behavior in healthcare workers. This assertion is in line with Asurakkody and Shin's (2018) analysis of innovative work behavior's antecedents. Doctors and nurses with longer years of service and older ages supposedly have more experience and knowledge about their respective fields, which is considered to increase or accelerate the tendency for innovative behavior to emerge.

Conclusion

This study found that work engagement cannot moderate the effects between perceived stress and innovative work behavior on healthcare workers. Correlation analysis also showed no significant relationship between perceived stress and innovative work behavior. However, there was a significant positive correlation between work engagement and innovative work behavior and a significant negative correlation between work engagement and perceived stress. These findings indicate that negative variables seem unable to predict the emergence of innovative work behavior in healthcare workers, so it is advised for further research to examine more positive variables in studying innovative work behavior among healthcare workers. This study can be valuable for hospital management and policymakers regarding the importance of job resources (autonomy, social support, supervisory support, and feedback) on the work engagement of healthcare workers. Job resources can help workers undertake their job demands and increase engagement, increasing innovative work behavior.

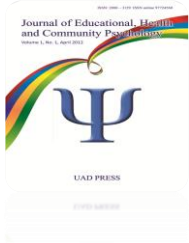
The follow-up study should also consider specifying the sampling criteria; therefore, it can represent the population more.

Acknowledgment

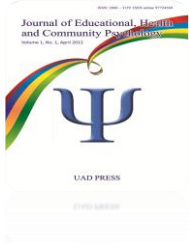
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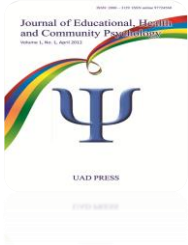
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