



Application of the Health Belief Model to Compliance with the Use of Personal Protective Equipment by Laundry Staff: A Systematic Literature Review

Irvan Maulana¹, Eko Winarti², Norfidah Mohamad³

¹ Master of Public Health Study Program, Faculty of Health Sciences, Kadiri University, Kediri City, East Java, Indonesia

² Faculty of Health Sciences, Kadiri University, Kediri City, East Java, Indonesia

³ Centre for Nursing Studies, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Puncak Alam, Selangor, Malaysia

ARTICLE INFORMATION

Received: May 16, 2023

Revised: August 21, 2023

Available online: February 2024

KEYWORDS

Health Belief Model; Personal Protective Equipment; Laundry Staff

CORRESPONDENCE

E-mail: irvanmaulana1986@gmail.com

A B S T R A C T

Personal protective equipment is essential to safeguard workers from potential hazards in the workplace, including chemicals, dust, heat, or germs. The proper use of personal protective equipment can prevent or reduce injuries and illnesses at work. The goal of this literature review is to explore research on the utilization of personal protective equipment by hospital laundry workers based on the health belief model.

The systematic literature review is the chosen method for conducting this study. It is a scientific approach employed to analyze, assess, synthesize, and critique research findings on specific themes or issues. To enhance compliance with personal protective equipment among laundry personnel, it is crucial to elevate knowledge and awareness, address unfavorable attitudes or perceptions, provide resources and comfort, implement adequate supervision and procedures, and foster a supportive organizational culture.

Healthcare organizations can promote adherence to personal protective equipment guidelines among laundry staff by offering instruction and training, facilitating communication and awareness, providing administrative support, enforcing oversight, setting positive role models, continuously evaluating, and improving procedures, engaging employees, and ensuring ongoing support and resources.

INTRODUCTION

Personal protective equipment is used to protect workers from danger in the workplace, such as chemicals, dust, heat, or germs. Injury or illness at work can be prevented or reduced by using personal protective equipment (Dickson, 2012). Laundry staff, who are in charge of washing, drying, ironing, and storing filthy garments from patients or hospital employees, is one occupation requiring personal protective equipment (Verbeek *et al.*, 2020). The risk of exposure to blood, body fluids, or other infectious agents that can cause hepatitis B, hepatitis C, HIV/AIDS, or tuberculosis exists for laundry staff. As a result, laundry employees must wear personal protective equipment such as gloves, masks, aprons, and boots (Environmental Health and Safety, 2018).

Some studies show that the personal protective equipment used by laundry staff still needs to be higher and per standards. For example, a Nigerian study found that only 38% of laundry staff wear gloves, and 18% wear masks while working (Omoijiade and Evbuomwan, 2019). Research in India also reported that only 50% of laundry staff wear gloves, and 25% use masks (Workers *et al.*, 2015). While research in Indonesia was written by Sari and Maulida Sari (2020) the analysis shows that the usage of personal protective equipment by staff in Haji Medan Hospital is primarily a private matter, which is connected to volume and depth of work. Content is concerned with discomfort and disgust on the psychological side,

as well as facilities, socialization, and control on the organizational side. Because some employees still choose not to wear personal protective equipment, decide not to wear it depending on the work environment, or only use it when it is hot and uncomfortable, the compliance of employees at Haji Medan Hospital with the use of personal protective equipment is still comparatively low. Factors that affect laundry staff's use of personal protective equipment include knowledge, attitude, availability of personal protective equipment, supervision, and motivation (Istigfari, 2022). The health belief model is a theory that may be applied to analyze these variables. An explanation for a person's health behavior based on belief or perception about the risk of disease and advantages of taking preventative measures is provided by the health belief model, a psychosocial theory by Karen Glanz, Barbara K. Rimer, K. Viswanath, Karen Glanz, Barbara K. Rimer, (2015). The six basic constructs of the health belief model are perceived perception of their vulnerability to illness and opinion of the disease's severity, known as their perceived susceptibility. A person's view of the advantages of preventive measures is known as the perceived benefit; a person's impression of barriers or challenges when implementing preventive measures; a trigger to action is an internal or external motivator for taking preventative action; and self-efficacy refers to one's perceptions of their capacity to take preventative action (Berhimpong, Rattu and Pertiwi, 2020).

Research on using personal protective equipment in hospital laundry personnel according to the health belief model still needs to be made available. Therefore, this systematic literature review examines the research on how to apply the health belief model to the use of personal protective equipment by hospital laundry personnel. In addition to recommending practical interventions to increase compliance with the use of personal protective equipment by hospital laundry staff, this study is expected to provide an overview of the factors that affect hospital laundry staff behavior when wearing personal protective equipment.

METHOD

The systematic literature review is a method that is applied to conduct this study. Systematic literature review is a scientific method for analyzing, assessing, synthesizing, and critiquing research findings on themes or issues. Research on how to apply the health belief model to laundry employees over personal protective equipment usage is the basis for the chosen article or journal. The selected articles/journals are the results of the health belief model, personal protective equipment, and laundry staff. The inclusion criteria are an article about the health belief model and personal protective equipment. This article discusses the health belief model and laundry staff, an article that discusses personal protective equipment and laundry staff, an article from research results in the form of systematic review, meta-analysis, scoping review, or concept analysis, an article published in English or Indonesian from 2019 to 2023, and an

article available in full text. The exclusion criteria used in this article are an article that does not correlate with the research topic, an article published in 2019, and an article not available in full text.

Several journal databases, including Google Scholar and Science Direct, were searched for articles using the terms "health belief model," "personal protective equipment," and "laundry staff." Based on the results of a literature search through publications in two databases (Google Scholar and Science Direct) and using customized keywords, researchers found 49 articles that matched these keywords. The search results that have been obtained are then checked for duplication and found that there are no similar articles. The researcher then screened using the Screening Record technique using inclusion criteria ($n = 28$), reviewed the articles for eligibility by downloading and reading the full-text articles ($n = 13$), and finally obtained several suitable articles. According to the library research theme, the study included evidence mapping ($n = 5$). The assessment was based on the adequacy of the inclusion and exclusion criteria obtained from as many as five articles that could be used in this literature review.

RESULT

Table 1 Article Result

No	Title and Author	Purpose	Method	Result
1	Factors Behind Non-Compliance with the Use of Complete Personal Protective Equipment for Laundry Staff at RSUD Idaman Kota Banjarbaru in 2021 (Anggraeni et al., 2021)	This study aims to determine the factors behind non-compliance with the use of complete personal protective equipment by laundry staff at Banjarbaru City Hospital in 2021.	Types of qualitative research with a phenomenological approach. Informant determination using purposive sampling was used in this study with laundry staff and the linen coordinator. Data collection techniques conducted by interviews (In-depth interviews)	The research results in this article show that the internal factors, namely the non-compliance of laundry staff with complete personal protective equipment, are knowledge and attitudes. In contrast, the external factor of non-compliance of laundry staff with complete personal protective equipment and the comfort of using personal protective equipment includes regulations on personal protective equipment. Monitoring of personal protective equipment and the environment
2	Analysis of Adherence to the Use of Personal Protective Equipment in Laundry Installation Workers at the Hajj General Hospital Medan (Sari and Maulida Sari, 2020)	This study was conducted to determine the adherence of personal protective equipment usage among laundry installation workers at the Haji Medan General Hospital.	The research method carried out is the qualitative method, with research informants being workers in the laundry installation of the Haji Medan General Hospital.	The analysis results show that using personal protective equipment for workers at Medan Hajj Hospital is an individual aspect of the length of work and knowledge. The most dominant element for workers using personal protective equipment is the organizational aspect, namely the available facilities and supervision from the leadership and supervisory sections' use of personal protective equipment while working.

3	The relationship between characteristics, knowledge, attitudes, and supervision in compliance with the use of personal protective equipment in laundry staff (Study at RS. X Lampung Province) (Tri Puji Astuti, Ida Wahyuni, 2019)	The purpose of this study is to analyze the relationship between worker behaviors and compliance with personal protective equipment by laundry staff in Hospital X Lampung Province.	The type of research used quantitative, using cross-sectional studies. The population in this study was all workers at laundry installation. The sample in this study was 21 people, and a total sampling technique was used.	Based on the results of the research that has been conducted, it can be concluded that characteristics of respondents in the laundry staff are mainly in the category of older adults (71.4%) with a high school education level (71.4%) and a long working period (66.7%). There is no significant relationship between age, education, length of service, and personal protective equipment compliance among laundry installation staff. An essential relationship exists between supervision and compliance with personal protective equipment used by laundry installation personnel.
4	The influence of knowledge, motivation, and risk perception on behavior use of essential personal protective equipment Moderated by Supervisory Factors at Civitas Hospital RSGMP Unsoed (Chotimah, Haryadi and Roestijawati, 2019)	The purpose of this study is to determine the influence of knowledge, motivation, and risk perception about the use of essential personal protective equipment on the behavior of using crucial personal protective equipment moderated by supervisory factors in the hospital community of RSGMP Unsoed	Respondents in this study were 127 people with proportionate random sampling techniques who were interviewed with instruments in the form of questionnaires. The analysis tool for this research is moderating regression (Moderating Regression Analysis) by utilizing the SPSS program.	The results show that knowledge, motivation, and perception influenced basic personal protective equipment use behavior. Supervision moderates the influence of knowledge and motivation on basic personal protective equipment use behavior. Still, it does not moderate the effect of risk perception on basic personal protective equipment use behavior.
5	The relationship between safety perception and compliance with the use of personal protective equipment (Health Belief Model Theory Approach) in Nurses of the Surabaya Hajj General Hospital (Artono, 2020)	The purpose of this study is to analyze the relationship between perception and compliance with the use of personal protective equipment (health belief model theory approach) in nurses at RSU Haji Surabaya.	This study is a type of observational study with a cross-sectional research design. The population of this study was all nurses on duty at the Al-Aqso Inpatient Installation of RSU Haji Surabaya, with a total sample of 33 people using entire sampling techniques and data taken by distributing questionnaires and making observations. Data analysis was carried out by looking at the values of the contingency coefficient and PH coefficient.	The results showed that 66.7% of nurses were categorized as moderately compliant, and 33.3% were categorized as good at using personal protective equipment. The results also show the health belief model perception variable with compliance variable was severity perception ($\phi = -0.328$), and the characteristic variable with the most vital relationship was the sex variable ($\phi = -0.326$). This study concludes that the level of nurse compliance with personal protective equipment is relatively low, and positive perceptions do not always increase compliance behavior.

DISCUSSION

Factors contributing to the laundry staff in RSUD Idaman Kota Banjarbaru are Non-Compliance with the use of complete personal protective equipment (Anggraeni *et al.*, 2021). The study results reveal internal and external factors that affect laundry staff's compliance with personal protective equipment. The inner components found, such as knowledge and attitudes, are consistent with research by Sari and Maulida Sari, (2020), which underlines the importance of individual factors in personal protective equipment compliance. Additionally, research by Chotimah, Haryadi, and Roestijawati, (2019) supports the notion that knowledge significantly impacts how people use personal protective equipment. The significance of outside elements, such as the accessibility and practicality of personal protective equipment, supports research by Sari and Maulida Sari, (2020) emphasizing the importance of organizational support in fostering compliance. Analysis of laundry installation workers compliance use of personal protective equipment at the Haji Medan General Hospital. The study (2020) sheds light on the variables influencing employees' adherence to unique laundry installation protective equipment regulations. Based on previous studies, including work by Anggraeni *et al.* (2021), the emphasis on individual aspects like the length of labor and knowledge is constant. Additionally, the importance of organizational elements, particularly facilities, and supervision, is consistent with the study by Chotimah, Haryadi, and Roestijawati, (2019) which highlights the importance of supervision in affecting wearers' behavior to use personal protective equipment. The correlation between individual protective equipment compliance and laundry personnel's characteristics, knowledge, attitudes, and supervision (Tri Puji Astuti, Ida Wahyuni, 2019). The study emphasizes the connection between several parameters and laundry staff compliance with wearing personal protective equipment. Although the results indicated that factors like age, education, and length of service did not significantly affect compliance, the significant relationship between supervision and compliance was consistent with other studies' findings, including those of Chotimah, Haryadi, and Roestijawati (2019). These results suggest that monitoring plays a vital role in promoting adherence to personal protective equipment guidelines.

Hospital RSGMP Unsoed use of essential personal protective equipment was influenced by knowledge, motivation, and risk perception, with supervisory variables acting as moderators (Chotimah, Haryadi, and Roestijawati, 2019). The research by Chotimah, Haryadi, and Roestijawati (2019) sheds light on how knowledge, motivation, risk perception, and supervision affect wearers' decisions to wear personal protective equipment. This result is consistent with studies by Anggraeni *et al.* (2021), which underline the value of education and supervision in encouraging adherence to personal protective equipment. The results of this study are also consistent with the moderating role that supervision plays in the interaction between knowledge, motivation, and conduct related to personal protective equipment. The correlation between nurses at Haji General Hospital Surabaya's perceptions of safety and their adherence use of

personal protective equipment. Artono's study (Artono, 2020) focused on the connection between nurses' attitudes toward safety and their use of personal protective equipment. Despite not directly examining the same components as other research we analyzed, this study offers important new information about how safety perceptions affect compliance behavior. According to research by Anggraeni *et al.* (2021), which emphasized the complex interaction of internal and external factors impacting personal protective equipment compliance, the conclusion is that favorable safety perceptions do not always correlate with higher compliance. These studies demonstrate the diversity of factors that influence personal protective equipment compliance by healthcare workers. This study's results highlight the significance of considering both organizational and individual elements, such as surveillance and the availability of personal protective equipment, as unique aspects, such as knowledge, attitudes, and perceptions of safety. Future studies should focus on incorporating these elements into holistic treatments that successfully encourage a culture of personal protective equipment compliance and enhance the safety of health workers. The findings of Anggraeni *et al.* (2021), the causes of laundry staff members' non-compliance with personal protective equipment usage are consistent with the tenets of the Health Belief Model. The health belief model's emphasis on individual beliefs and perceptions as determinants of health-related behaviors is congruent with identifying internal components, such as knowledge and attitudes. Research by Chotimah, Haryadi, and Roestijawati (2019), as well as Sari and Maulida Sari (2020), also highlighted the impact of individual characteristics, particularly knowledge, on personal protective equipment compliance, research that supports the conclusions of this study. Additionally, the survey by Anggraeni *et al.* (2021) illustrates the organizational support element of the health belief model by recognizing external elements such as the accessibility and ease of personal protective equipment. A supportive environment and the availability of required resources are just two examples of external cues for action that the health belief model acknowledges are crucial in fostering health-related behaviors. In general, the study's findings by Anggraeni *et al.* (2021) reinforce the Health Belief Model's applicability in understanding the variables that contribute to noncompliance with the use of personal protective equipment. Interventions can be created to address these factors and encourage compliance with individual protective equipment procedures among laundry personnel by considering internal variables (knowledge and attitudes) and external factors (availability and comfort of personal protective equipment).

Another research that related to this research is by Istigfari *et al.* The study presented in this article aimed to identify the effectiveness of the human factor design method in improving personal protective equipment compliance among health workers. The literature review of six articles showed that human factor design is an effective intervention that can improve individual protective equipment compliance by considering physical, cognitive, and organizational domains. The study recommended several strategies, such as standardization and dissemination of care through comprehensive information with poster media,

educational videos, and supervision to improve personal protective equipment compliance among hospital health workers. From a researcher's perspective, the study contributes to the growing literature on infection control and prevention among health workers. The findings suggest that the human factor design method can effectively improve personal protective equipment compliance by addressing various factors that influence health worker behavior. This approach aligns with the principles of systems thinking, which recognizes that complex problems require holistic solutions considering multiple factors. However, it is essential to acknowledge some limitations of this study. The literature review only included articles published between 2012 and 2021 and written in Indonesian or English. This may limit the generalizability of the findings to other languages or periods. The sample size of six articles may be representative of only some relevant studies on personal protective equipment compliance among health workers. However, this study provides valuable insights into effective interventions for improving individual protective equipment compliance among hospital health workers. The strategies recommended in this study are practical and engaging for health workers, which can increase their motivation to comply with the use of personal protective equipment. Further research is needed to explore the effectiveness of these strategies in different settings and populations. This study highlights the importance of developing effective infection control and prevention interventions among health workers. The human factor design method is a promising approach that considers various factors influencing health worker behavior and can improve personal protective equipment compliance. Future research should continue to explore innovative strategies for improving infection control practices among health workers.

CONCLUSION

The literature review in this outline is variables influencing laundry personnel in healthcare settings to adhere to personal protective equipment. There are some universal findings and themes despite each study approaching the subject from a different standpoint and employing a different research methodology. Internal variables are Compliance with the use of personal protective equipment is significantly influenced by knowledge, attitudes, and perceptions. Studies repeatedly demonstrate that a lack of understanding of personal protective equipment's significance and unfavorable attitudes or perceptions towards it can lead to non-compliance. An organization's support is essential to encourage compliance, including availability of personal protective equipment, comfort, and supervision. According to studies, the availability of sufficient resources, efficient supervision, and promoting policies and regulations substantially impact how well personal protective equipment standards are followed. The ideas of the Health Belief Model, which emphasizes the relevance of individual beliefs and perceptions in forming health-related behavior, are consistent with the findings of several studies. Knowledge, attitude, risk perception, and organizational support are all factors that enable the development of a health belief model. Overall, the research reviewed

highlights the variety of factors influencing adherence to the use of personal protective equipment. They emphasized the significance of addressing internal (such as knowledge and attitudes) and external (such as availability of personal protective equipment and organizational support) elements in interventions that foster individual protective equipment compliance among health workers. Providing adequate resources and comfort for personal protective equipment, addressing negative attitudes or perceptions towards personal protective equipment, implementing adequate supervision and policies, and developing a supportive organizational culture are critical components of improving individual protective equipment compliance among laundry staff. Including these elements in complete interventions can help create safer workplaces and better safeguard health professionals.

REFERENCES

- Anggraeni, S. *et al.* (2021) ‘Faktor Yang Melatarbelakangi Ketidakpatuhan Penggunaan Alat Pelindung Diri Lengkap Pada Petugas Laundry Di RSUD Idaman Kota Banjarbaru Tahun 2021’. Available at: <http://eprints.uniska-bjm.ac.id/8634/> (Accessed: 31 May 2023).
- Artono, A. (2020) ‘Hubungan Persepsi Keselamatan Dengan Kepatuhan Penggunaan Alat Pelindung Diri (Pendekatan Teori Health Belief Model) Pada Perawat Rumah Sakit Umum’, *Jurnal Imejing Diagnostik*, 8, pp. 65–74. Available at: <https://repository.unair.ac.id/95031/> (Accessed: 24 May 2023).
- Berhimpong, M.J.A., Rattu, A.J.M. and Pertiwi, J.M. (2020) ‘Analisis Implementasi Aktivitas Fisik Berdasarkan Health Belief Model oleh Tenaga Kesehatan di Puskesmas’, *Journal of Public Health and Community Medicine*, 1(4), pp. 54–62.
- Chotimah, C.C., Haryadi, H. and Roestijawati, N. (2019) ‘Pengaruh Pengetahuan, Motivasi Dan Persepsi Risiko Terhadap Perilaku Penggunaan Alat Pelindung Diri Dasar Yang Dimoderasi Faktor Pengawasan Pada Civitas Hospitalia RSGMP UNSOED’, *Jurnal Ekonomi, Bisnis, dan Akuntansi*, 21(3). Available at: <https://doi.org/10.32424/jeba.v21i3.1367>.
- Dickson, E.F.G. (2012) *Personal Protective Equipment For Chemical, Biological, And Radiological Hazards - Design, Evaluation, and Selection*. Kingston, Ontario, Canada: John Wiley & Sons, Inc., Hoboken, New Jersey.
- Environmental Health and Safety (2018) ‘Personal Protective Equipment Manual Equipment (PPE)’, pp. 1–36.
- Istigfari, L.D. (2022) ‘Kepatuhan Penggunaan Alat Pelindung Diri pada Petugas Kesehatan di Rumah Sakit melalui Pengembangan Metode Human Factor Design: Kajian Literatur’, *ejournal2.undip.ac.id*, 5(1), pp. 111–124. Available at: <https://ejournal2.undip.ac.id/index.php/hnhs/article/download/14908/7622> (Accessed: 31 May 2023).
- Istigfari, L.D. *et al.* (2022) ‘Kepatuhan Penggunaan Alat Pelindung Diri pada Petugas Kesehatan di Rumah Sakit melalui Pengembangan Metode Human Factor Design: Kajian Literatur’, *Holistic Nursing and Health Science*, 5(1), pp. 111–124. Available at: <https://ejournal2.undip.ac.id/index.php/hnhs/article/download/14908/7622> (Accessed: 31 May 2023).
- Karen Glanz, Barbara K. Rimer, K. Viswanath, Karen Glanz, Barbara K. Rimer, K.V. (2015) *Health*

Behavior Theory, Research, and Practice 5th edition. 5th editio. Available at: <https://www.perlego.com/book/996608/health-behavior-theory-research-and-practice-pdf>.

- Omoijiade, E.N. and Evbuomwan, L. (2019) ‘Personal protective equipment compliance among laundry workers in secondary and tertiary health facilities in {Nigeria}’, *International Journal Of Community Medicine And Public Health*, 6(3), p. 936. Available at: <https://doi.org/10.18203/2394-6040.ijcmph20190575>.
- Sari, R.M.R.R.M. and Maulida sari, R. (2020) *Analisis Kepatuhan Pemakaian Alat Pelindung Diri Pada Pekerja Instalasi Laundry di Rumah Sakit Umum Haji Medan, Braz Dent J*. Universitas Islam Negeri Sumatera Utara. Available at: <http://repository.uinsu.ac.id/id/eprint/14409> (Accessed: 24 May 2023).
- Tri Puji Astuti, Ida Wahyuni, S.J. (2019) ‘Hubungan Karakteristik, Pengetahuan, Sikap Dan Pengawasan Dengan Kepatuhan Pemakaian Alat Pelindung Diri Pada Petugas Laundry (Studi di RS. X Provinsi Lampung)’, *Jurnal Kesehatan Masyarakat (e-Journal)*, 7(3), pp. 39–46. Available at: <http://ejournal3.undip.ac.id/index.php/jkm%0Asehingga>.
- Verbeek, J.H. *et al.* (2020) ‘Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff’, *Cochrane Database of Systematic Reviews*, 2020(4). Available at: <https://doi.org/10.1002/14651858.CD011621.PUB4/ABSTRACT>.
- Workers, C. *et al.* (2015) ‘Knowledge, Attitude and Practice of Standard Precautions among The Health Care Workers of a Tertiary Care Teaching Hospital of North India’, *INTERNATIONAL JOURNAL OF CONTEMPORARY MEDICAL RESEARCH*, 2(5), pp. 1282–1285. Available at: https://www.researchgate.net/publication/308552684_Knowledge_Attitude_and_Practice_of_Standard_Precautions_among_The_Health_Care_Workers_of_a_Tertiary_Care_Teaching_Hospital_of_North_India.