Open Access Research Journal of
Science and Technology
Journals home page: https://oarjst.com/
ISSN: 2782-9960 (Online)

OARJ OPEN ACCESS RESEARCH JOURNALS

(RESEARCH ARTICLE)

Check for updates

PARADOX OF PREVENTION: DETERMINANTS OF NON-COMMUNICABLE DISEASE SERVICE UTILIZATION AMONG INDUSTRIAL WORKERS IN INDONESIA USING THE HEALTH BELIEF MODEL

Nasrul Zaman *

Department of Public Health, Faculty of Medicine University of Syiah Kuala, Banda Aceh, Indonesia.
* Corresponding Author

ORCID Details
Nasrul Zaman: https://orcid.org/*0009-0008-6768-006X*

Open Access Research Journal of Science and Technology, 2026, 17(02), 109–115

Publication history: Received on 12 July 2026; revised on 24 August 2026; accepted on 26 August 2026

Article DOI: https://doi.org/10.53022/oarjst.2026.17.2.0079

ABSTRACT

The underutilization of Non-Communicable Disease (NCD) Integrated Health Services Program (IHSP) among industrial workers is a significant issue, primarily driven by internal factors such as limited awareness, perceived barriers, and cultural attitudes towards health. Workers often prioritize their work over personal health, leading to neglect of health services like NCD IHSP. This study aims to identify the internal factors influencing industrial workers' utilization of NCD IHSP, applying the Health Belief Model (HBM) to assess perceived vulnerability, seriousness, benefits, barriers, and self-efficacy. The objective is to provide recommendations for improving service utilization at governmental and corporate levels. A quantitative approach using a structured questionnaire was conducted among 700 workers in ten industrial estates across Indonesia. Structural Equation Modeling (SEM) with SmartPLS was used to analyze the relationships between HBM variables and NCD IHSP utilization. The findings reveal that perceived seriousness and barriers significantly impact NCD IHSP utilization, whereas perceived benefits and self-efficacy show weaker associations. Many workers remain unaware of their NCD risks and do not utilize available preventive health screening services. The lack of targeted health campaigns and flexible worker service hours further contributes to low service uptake. The study concludes that increasing NCD IHSP utilization can be achieved through health education campaigns tailored to workers' needs and environments. Raising awareness about NCD risks and emphasizing the benefits of early detection, integrated into workplace policies, is crucial for promoting healthy behaviours and reducing NCD risks among workers.

Keywords: Perceived Susceptibility, Perceived Seriousness, Perceived Barriers, Perceived Benefits, Self-Efficacy, Industrial Workers, NCD IHSP Utilization

1 INTRODUCTION

Most workers are unaware of the importance of using the Integrated Health Service Post (IHSP) for early screening of Non-Communicable Diseases (NCDs) due to lack of health awareness, health understanding and knowledge, limited free time, and difficult access to IHSP NCD services [1], [2], [3], [4]. In addition, workers often always feel healthy and do not

consider themselves susceptible to NCDs due to their work environment, thus ignoring preventive checks such as early screening of NCDs [5], [6].

The lack of education and socialization about the benefits of NCD IHSP and cultural and economic factors that prioritize work over health have also been factors causing the low utilization of NCD IHSP services, which are very important for early detection in NCD prevention [4], [10]. Lack of information about the benefits of NCD IHSP health services for industrial workers due to ineffective communication and low health literacy. Workers who do not understand the benefits of IHSP NCD preventive services tend to ignore these services [13], [14], [15].

Company policies that have not supported the maximum utilization of NCD IHSP by industrial workers have become a form of lack of attention from company management to the health of its workers [17], [18]. Some companies do not integrate preventive health services such as NCD IHSP into the company's health policy and have not provided adequate facilities to support workers' easy access to NCD IHSP services [21], [22], [23].

The influence of local culture has shaped an indifferent attitude towards health care and has prioritized hard work over health care, which is considered a secondary need [24], [25], [26]. This social stigma hinders workers from seeking health services such as NCD IHSP. Cultural values that prioritize treatment after suffering illness and neglect disease prevention have influenced the low utilization of NCD IHSP services in the workplace [27], [28], [29].

Individual perceptions and awareness of industrial workers about the health risks and dangers of NCDs associated with their work [30], [31], [32], such as work stress, exposure to chemicals, or physical deterioration due to working conditions, are still minimal and have not been fully explored in the context of industrial workers' health behaviours. The specific internal factors of each worker that influence their decision to utilize NCDs of IHSP routinely are still poorly understood, especially related to individual differences, such as personal health conditions, knowledge, and awareness of health maintenance, including NCDs [33], [34]. The effectiveness of the NCD IHSP program in increasing health awareness, behaviour change, and the level of utilization of health services by workers and the factors that affect workers' participation in the NCD IHSP program have not been fully explored. Therefore, using the Health Belief Model theory (*perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, self-efficacy),* it sought to gain a comprehensive understanding of the internal factors of individual workers that affect their behaviour in utilizing IHSP NCD health services in the industrial area where the worker is active.

Objectives of the research

The research aims to explore internal factors that affect the willingness of industrial workers to utilize NCD IHSP to provide policy recommendations by offering solutions for governments and companies, as well as a strategy to increase worker participation in the utilization of NCD IHSP.

1.1 Research Gap Analysis

This study identified a significant gap in utilizing non-communicable disease integrated health service posts (NCD IHSP) services by workers in industrial areas, where only a few have used the health service. In this context, gap analysis is carried out to identify psychological and social factors that affect decisions to use IHSP, including perceptions of health risks, service benefits, and perceived barriers. Thus, the gap is not only limited to physical or geographical aspects but also related to psychological aspects that affect the workers' health behaviour, which have not been widely explored in related research.

1.2 Research Novelty

This study's uniqueness lies in applying the Health Belief Model (HBM) to understand the low utilization of IHSP NCD services in the worker environment in industrial estates. The research is a topic that is still limited in the industrial health literature because HBM is adapted to the context of industrial workers with social and economic challenges. This research makes a new contribution by exploring the barriers and benefits felt by industrial workers in accessing NCD IHSP, taking into account the psychological factors that influence their decisions, such as self-confidence, perception of disease risk, and other social factors. This study offers more profound insights into the factors influencing healthcare utilization in the industrial sector, which previous studies have not covered.

2 RESEARCH METHOD

Using a quantitative approach and a structured questionnaire to obtain data from indicators, the research method was used to measure exogenous and endogenous variables that affect the low utilization of NCD IHSP among industrial workers.

The population is all workers in the existing industrial estate, with a selected sample of 700 workers in ten selected industrial estates determined through multi-tiered random sampling in each area to ensure representation in various sectors within the industrial estate. The survey instrument is designed to capture the indicators used by variables in the HBM theory (perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers and self-efficacy).

The data collected will be analyzed using SmartPLS structural equation modelling statistics to decipher the utilization pattern and modelling of structural equations (path analysis) to assess the relationship between model construction and endogenous variables (utilization of NCD IHSP). This method ensures a comprehensive understanding of the factors influencing the healthcare utilization behaviour of individual industry workers and provides robust insights for policy recommendations.

3 RESULT AND DISCUSSION

The results showed that 63% did not know what NCDs were, and 58% of workers did not know the benefits of NCDs of JCI. The findings explain that health campaigns aimed at industrial workers are minimal, especially campaigns about NCDs and the potential for increased NCD risk for workers in the workplace daily, potentially increasing the risk of NCDs in the workers themselves [37]. Observations on IHSP NCDs near industrial estates also showed low (<35%) worker participation in NCD IHSP activities. The results of this observation further strengthen the suspicion that there has been no program specifically carried out by IHSP for workers in its work area [38]. The absence of pamphlets, posters or leaflets in the work areas of industrial workers can indicate that health service promotion has not been carried out in industrial areas, and this further confirms that the special health promotion treatment for workers with the topic of NCD risk in workers has not received attention and the form of health campaigns is still aligned with the targets and patterns of health campaigns for the general public. Meanwhile, the results of statistical measurement of the influence of perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers and self-efficacy on the utilization of IHSP can be explained in the table 1 below:

Table 1: Path Coefficients in the Inner Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Barriers -> Utilization of NCD IHSP	0.307	0.304	0.056	5.467	0.000
Benefits -> Utilization of NCD IHSP	-0.119	-0.110	0.058	2.074	0.039
Self Efficacy -> Utilization of NCD IHSP	0.000	0.002	0.040	0.002	0.998
Seriousness -> Utilization of NCD IHSP	0.344	0.344	0.040	8.584	0.000
Susceptibility -> Utilization of NCD IHSP	0.272	0.268	0.062	4.386	0.000

The statistical calculation table with SmartPLS shows Path Coefficient results to explain the relationship between exogenous and endogenous variables in structural models. The results are as explained below:

Perceived Barriers → Utilization of NCD IHSP: A coefficient of 0.307 significantly influences CPI utilization (T = 5.467, P = 0.000). This result means a significant positive relationship exists between the perception of obstacles and the use of IHSP, or the greater the perceived obstacles, the higher the utilization of the IHSP NCD program. These results suggest that even if perceived barriers, such as time, cost, or accessibility, increase, it can encourage workers who have experienced NCDs to use health services better. This finding may be influenced by psychological factors due to the increased risk of NCD severity that has made individuals feel the need to overcome these barriers [39], [40]. The statistical test results prove that the perception of barriers is important in decisions on utilizing IHSP NCDs.

Perceived Benefits → Utilization of NCD IHSP: Coefficient -0.119 showed a significant adverse effect (T = 2.074, P = 0.039). This result indicates that although the benefits of the NCD IHSP program are understood, the factor of workers who have never done a complete health examination and received NCD examination services makes workers not willing to utilize the CND IHSP services optimally or even though workers understand the perception of benefits to the NCD IHSP program, workers have not taken advantage of the existing NCD IHSP. This phenomenon can be explained by other factors, such as industrial workers who have never done medical check-ups or regular CND examinations, so workers do not know whether they have NCDs [41], [42]. The perception still built is the assumption that the worker's condition is still healthy and does not need health services, including early detection of NCDs. These findings corroborate the

information that even though the workers' health knowledge is good if they have never done a health examination for early detection of NCDs, they still tend to ignore the NCD services of IHSP.

Self-Efficacy → Utilization of NCD IHSP: A coefficient of 0.000 and a very high P-value (0.998) indicate that significant self-efficacy does not affect the utilization of CPI. This calculation shows that self-efficacy does not significantly affect the utilization of IHSP, with a coefficient of 0.000 and a very high P value (0.998), indicating that the relationship between the two is not statistically significant. The results indicate that although workers may have confidence in their ability to access and utilize health services, these factors are not strong enough to encourage them to use NCD services in IHSP. The findings found that there are other factors, such as the perception of barriers or health awareness, that may play a greater role in influencing workers to use NCD IHSP, while existing confidence is not enough to motivate workers to make decisions to use NCD IHSP even though these workers feel capable of doing so.

Perceived Seriousness → Utilization of NCD IHSP: A coefficient of 0.344 indicates a significant strong positive influence (T = 8.584, P = 0.000). The higher the seriousness of dealing with the disease, the higher the utilization of JCI. The results of this calculation show that the perception of the seriousness of the disease has a significant positive influence on the utilization of NCD IHSP services. It also indicates that the higher the perception of workers' seriousness towards non-communicable diseases (NCDs), the more likely they are to take advantage of JCI NCD services. These findings can be explained by the Health Belief Model theory, in which individuals tend to be more motivated to take preventive measures or treatments when they feel more threatened by potential severe health impacts. Therefore, raising workers' awareness of the seriousness of NCDs can be an effective strategy to encourage the utilization of such health services [37], [43]. For example, showing what potential risks in the work environment of each worker can increase the risk of NCD, whether it is work dust, workstations (ergonomics), working temperature, or other occupational risks.

Perceived Susceptibility → Utilization of NCD IHSP: A coefficient of 0.272 indicates a significant positive influence (T = 4.386, P = 0.000), meaning that awareness of susceptibility to disease increases the utilization of NCD IHSP. The results of this calculation indicate that the perception of disease susceptibility has a significant positive influence on the use of IHSP, meaning that the higher the awareness of workers about vulnerability to NCDs, the greater the likelihood that they will use IHSP NCD services. These findings support the Health Belief Model theory, which states that individuals are more likely to act when they feel vulnerable to health risks [44], [45]. Therefore, increasing workers' understanding of their susceptibility to NCDs due to the environment and daily working conditions can be an important step in encouraging them to be more active in using available health services.

4 CONCLUSIONS AND SUGGESTIONS

This study found a lack of workers' understanding and knowledge about CND, so it is necessary to have health campaigns related to the early detection of NCDs, specifically for industrial workers. Campaign materials are adjusted to the environmental conditions and working conditions of workers, and campaigns need to be carried out in an inclusive manner that involves at least the government, companies and labour unions in every company in the industrial area to jointly actively carry out health promotion about the importance of routine early detection of CND in every IHSP that workers can reach. The campaign can be by distributing pamphlets, brochures, banners, and even dialogue forms in locations that are easy to attend, see, and reach industrial workers.

Seeing the lack of use of IHSP by employees, to be able to increase the use of NCD IHSP services, it is necessary to prepare CND early detection services at special times for workers, for example, inspections are carried out during the hours when workers go home or in the hours before going to work.

The value of Perceived Barriers to the Utilisation of NCD IHSP, which has a positive and significant effect, means that the average worker who has experienced and suffered from NCD will make maximum efforts to utilize the available IHSP CND services. Likewise, the Perceived Seriousness factor has the most significant influence on the use of IHSP, especially those who have experienced the severity of NCDs; the social and emotional consequences experienced when sick and their understanding of the risk of NCDs will directly increase workers' efforts to utilize existing IHSP NCD services.

The low value of Perceived Benefits for the Utilization of NCD IHSP shows that there are still many workers in companies in industrial estates who have never done medical check-ups and the use of CND early detection services, so workers have not felt the benefits of the CND IHSP service. The insignificant value of self-efficacy shows that health education (informal) or health campaigns, especially about the high and diverse risk factors of NCDs in the workplace, have not been routinely and massively carried out by the government/health office (IHSP) and the company so that workers do not have good knowledge about preventing and reducing the potential for NCDs in themselves.

The Perceived Susceptibility value, which is also insignificant, indicates that workers' perception of their risk or vulnerability to NCDs is still low, so workers do not feel it is important to access NCD early detection services at IHSP even though they are easily accessible. The study results further strengthen the suspicion that workers' knowledge and understanding of the magnitude of potential and the variety of risks of suffering from NCDs is still weak and needs to be strengthened through regular health education and campaigns following the context of workers.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

The author would like to extend profound appreciation to the management authorities and occupational health divisions of the ten industrial estates across Indonesia for granting administrative clearance and operational access to conduct this study. Sincere gratitude is also conveyed to all participating industrial workers who voluntarily contributed their valuable time and empirical insights. The author also acknowledges the institutional and academic environment provided by the Department of Public Health, Faculty of Medicine, Universitas Syiah Kuala, which facilitated the conceptualization and scholarly execution of this research. Special appreciation is given to SmartPLS GmbH for the statistical tools used in the structural modeling of this study.

REFERENCES

[1] K. Kikuchi *et al.*, "Interventions integrating non-communicable disease prevention and reproductive, maternal, newborn, and child health: A systematic review," *Biosci. Trends*, vol. 12, no. 2, pp. 116–125, 2018, doi: 10.5582/bst.2018.01070.

[2] H. Gallardo-Rincón *et al.*, "Integrated Measurement for Early Detection (MIDO) as a digital strategy for timely assessment of non-communicable disease profiles and factors associated with unawareness and control: A retrospective observational study in primary healthcare facilities in," *BMJ Open*, vol. 11, no. 9, pp. 1–10, 2021, doi: 10.1136/bmjopen-2021-049836.

[3] J. Tan *et al.*, "Hypertension Care Coordination and Feasibility of Involving Female Community Health Volunteers in Hypertension Management in Kavre District, Nepal: A Qualitative Study," *Glob. Heart*, vol. 15, no. 1, pp. 1–12, 2020, doi: 10.5334/GH.872.

[4] A. Bachtiar, S. N. Hasri, and C. Candi, "Analyzing implementation of integrated health services post: a mixed-method," *J. Integr. Care*, 2025, doi: 10.1108/JICA-11-2024-0064.

[5] A. McCarthy and N. Damiran, "Non-Communicable Disease Risk Factors among a Cohort of Mine Workers in Mongolia," *J. Occup. Environ. Med.*, vol. 61, no. 12, pp. 1072–1077, 2019, doi: 10.1097/JOM.0000000000001755.

[6] A. Steel, S. Strommer, J. Adams, and D. Schoenaker, "Preconception health policy, health promotion, and health services to achieve health in current and future generations: a narrative review," *BMC Pregnancy Childbirth*, vol. 25, no. 1, 2025, doi: 10.1186/s12884-025-07176-0.

[7] T. D. Pilusa, C. B. Ntimana, M. P. Maphakela, and E. Maimela, "Exploring Healthcare Workers' Knowledge and Perspectives on Behavioral Risk Factors Contributing to Non-Communicable Diseases: A Qualitative Study in Bushbuckridge, Ehlanzeni District, Mpumalanga Province, South Africa," *Int. J. Environ. Res. Public Health*, vol. 22, no. 3, pp. 1–11, 2025, doi: 10.3390/ijerph22030343.

[8] M. Odawara, J. Saito, A. Yaguchi-Saito, M. Fujimori, Y. Uchitomi, and T. Shimazu, "Using implementation mapping to develop strategies for preventing non-communicable diseases in Japanese small- and medium-sized enterprises," *Front. Public Heal.*, vol. 10, 2022, doi: 10.3389/fpubh.2022.873769.

[9] A. Pirrello *et al.*, "An observational study on non-communicable disease risk factors among healthcare workers in high-stress environments," *Front. Public Heal.*, vol. 13, 2025, doi: 10.3389/fpubh.2025.1609034.

[10] N. F. Wendimagegn and M. C. Bezuidenhout, "Integrating promotive, preventive, and curative health care services at hospitals and health centers in Addis Ababa, Ethiopia," *J. Multidiscip. Healthc.*, vol. 12, pp. 243–255, 2019, doi: 10.2147/JMDH.S193370.

[11] R. Mathew and J. J. Olickal, "Noncommunicable Disease Service Utilization from the Upgraded Primary Care Centers: A Cross-Sectional Study from Kerala, India," *Med. J. Dr. D.Y. Patil Vidyapeeth*, vol. 17, no. 3, pp. 553–559, 2024, doi: 10.4103/mjdrdypu.mjdrdypu_961_22.

[12] N. Syamsuddin, A. Razak, and M. A. Arifin, "PERFORMANCE OF HEALTH OFFICERS AND FAMILY SUPPORT IN MOTIVATING FOR THE UTILIZATION OF INTEGRATED NONCOMMUNICABLE DISEASES (POSBINDU PTM)," *Asia Pacific J. Heal. Manag.*, vol. 20, no. 1, 2025, doi: 10.24083/apjhm.v20i1.4031.

[13] N. Mheidly and J. Fares, "Health communication in low-income countries: A 60-year bibliometric and thematic analysis," *J. Educ. Health Promot.*, vol. 9, no. 1, 2020, doi: 10.4103/jehp.jehp_384_20.

[14] E. T. Fenta *et al.*, "Exploring barriers of health literacy on non-communicable disease prevention and care among patients in north wollo zone public hospitals; Northeast, Ethiopia, 2023: application of socio-ecological model," *BMC Public Health*, vol. 24, no. 1, pp. 1–10, 2024, doi: 10.1186/s12889-024-18524-8.

[15] L. I. Zungu and K. G. Setswe, "An integrated approach to the prevention and promotion of health in the workplace: A review from international experience," *South African Fam. Pract.*, vol. 49, no. 6, pp. 6–9, 2007, doi: 10.1080/20786204.2007.10873564.

[16] S.-Y. D. Lee, A. M. Arozullah, and Y. I. Cho, "Health literacy, social support, and health: A research agenda," *Soc. Sci. Med.*, vol. 58, no. 7, pp. 1309–1321, 2004, doi: 10.1016/S0277-9536(03)00329-0.

[17] J. Davis-Street, N. Sanderson, A. Shannon, N. Ryan, P. Brash, and S. Estala, "Implementing a global workplace wellness strategy - Theoretical foundations and business value," in *Society of Petroleum Engineers - SPE International Conference and Exhibition on Health, Safety, Security, Environment, and Social Responsibility*, Chevron, United States: Society of Petroleum Engineers, 2016. doi: 10.2118/179485-ms.

[18] L. N. Safiullin and A. F. Mingazova, "Improvement of efficiency of labor capacity on the example of oil and gas processing enterprise," *Int. J. Emerg. Technol.*, vol. 10, no. 2, pp. 173–176, 2019, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85074714261&partnerID=40&md5=45d1132a7fe230208d5b4d3a057cc6b2

[19] E. M. Nagler *et al.*, "Using total worker health® implementation guidelines to design an organizational intervention for low-wage food service workers: The workplace organizational health study," *Int. J. Environ. Res. Public Health*, vol. 18, no. 17, pp. 1–16, 2021, doi: 10.3390/ijerph18179383.

[20] É. S. M. Da Costa, A. Hyeda, and E. M. C. P. Maluf, "Relationship between organizational support at work and risk of non-communicable chronic diseases in a health service," *Rev. Bras. Med. do Trab.*, vol. 15, no. 2, pp. 134–141, 2017, doi: 10.5327/Z1679443520176046.

[21] C. Boudreaux *et al.*, "Organization of services for severe chronic Noncommunicable diseases at first-level hospitals in nine lower-income countries: Results from a Baseline assessment of PEN-Plus initiation," *PLOS Glob. Public Heal.*, vol. 5, no. 5 May, pp. 1–14, 2025, doi: 10.1371/journal.pgph.0004552.

[22] Algerienne, "Plan Strategique National Multisectoriel De Lutte Integree Contre Les Facteurs De Risque Des Maladies Non Transmissibles 2015 - 2019," pp. 1–46, 2015.

[23] Y. P. Sharma, H. P. Kaphle, N. Shrestha, J. P. Upadhyay, and S. Poudel, "Service Readiness of Primary Health Care Facilities for Non-Communicable Diseases Management," *J. Nepal Health Res. Counc.*, vol. 22, no. 1, pp. 142–149, 2024, doi: 10.33314/jnhrc.v22i01.4914.

[24] J. Uddin, M. Hossin, F. Mahbub, and M. Hossain, "Healthcare-seeking behavior among the chakma ethnic group in bangladesh: Can accessibility and cultural beliefs shape healthcare utilization?," *Int. Q. Community Health Educ.*, vol. 33, no. 4, pp. 375–389, 2012, doi: 10.2190/IQ.33.4.e.

[25] E. Cole, M. Stevenson, and B. Rodgers, "The influence of cultural health beliefs on self-reported mental health status and mental health service utilization in an ethnically diverse sample of older adults," *J. Fem. Fam. Ther.*, vol. 21, no. 1, pp. 1–17, 2009, doi: 10.1080/08952830802683657.

[26] S. Nallala, U. Ghosh, S. S. Desaraju, S. Kadam, R. R. Kadarpeta, and S. Van Belle, "Why are they 'unreached'? Macro and Meso determinants of health care access in hard to reach areas of Odisha, India," *Int. J. Equity Health*, vol. 22, no. 1, pp. 1–12, 2023, doi: 10.1186/s12939-022-01817-y.

[27] S. Gupta and D. Bhugra, "Assessment across cultures," *Psychiatry*, vol. 8, no. 9, pp. 330–332, 2009, doi: 10.1016/j.mppsy.2009.06.013.

[28] Z. E. Pardoel *et al.*, "A Guideline for Contextual Adaptation of Community-Based Health Interventions," *Int. J. Environ. Res. Public Health*, vol. 19, no. 10, pp. 1–16, 2022, doi: 10.3390/ijerph19105790.

[29] H. S. Faust and P. T. Menzel, "Introduction," in *Prevention vs. Treatment: What's the Right Balance?*, University of New Mexico, United States: Oxford University Press, 2012. doi: 10.1093/acprof:oso/9780199837373.003.0001.

[30] N. I. Latyshevskaya, L. A. Davydenko, A. V Belyaeva, and M. A. Alborova, "Features of awareness and perception of health risks by workers of an industrial enterprise (On the model of metalworking machine workers)," *Profil. Meditsina*, vol. 23, no. 1, pp. 51–56, 2020, doi: 10.17116/profmed20202301151.

[31] İ. Medeni, E. Gültekin Koç, V. Medeni, and M. Necmi İlhan, "Occupational Risk Perception and Associated Factors Among Textile Workers: A Cross-Sectional Study From Türkiye," *Work. Heal. Saf.*, vol. X, no. 29, pp. 1–11, 2025, doi: 10.1177/21650799251322198.

[32] B. Jamatia, K. Anand, S. K. Kapoor, and R. M. Pandey, "Behavioral risk factors for non-communicable disease among factory employees in Faridabad; Haryana," *J. Nepal Med. Assoc.*, vol. 48, no. 175, pp. 203–208, 2009, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-77957272470&partnerID=40&md5=0e261087f8220efa76efb0a6b1d30871

[33] T. F. Anagaw *et al.*, "Health-seeking behavior among non-communicable disease patients globally, systematic review and meta-analysis," *SAGE Open Med.*, vol. 11, 2023, doi: 10.1177/20503121231215236.

[34] I. L. Hilmi, S. D. Alfian, R. Abdulah, and I. M. Puspitasari, "Factors Associated with Health-Seeking Behavior in Indonesia: Evidence from the Indonesian Family Life Survey 2014," *Med.*, vol. 60, no. 10, pp. 1–12, 2024, doi: 10.3390/medicina60101607.

[35] G. B. Kagaruki *et al.*, "Assessment of community knowledge on non-communicable diseases to inform the pilot of WHO PEN-Plus initiatives in selected two districts in Tanzania," *PLoS One*, vol. 20, no. 4 April, pp. 1–17, 2025, doi: 10.1371/journal.pone.0321695.

[36] A. Al-Dahshan, N. Alkaabi, S. Naja, N. Adil, T. Al-Shammari, and H. Alkaabi, "Prevalence of non-communicable disease and the associated factors among healthcare workers in Qatar," *BMC Prim. Care*, vol. 26, no. 1, 2025, doi: 10.1186/s12875-025-02760-x.

[37] E. K. Dzantor, M. Kweku, E. S. K. Morhe, and S. Z. Bugri, "Prioritizing Workplace Health Promotion Policy to Address High Blood Pressure and Obesity in a Public University in the Northern Region of Ghana," *Inq. (United States)*, vol. 60, 2023, doi: 10.1177/00469580231218627.

[38] P. Rossi, F. Miele, and E. M. Piras, "The co-production of a workplace health promotion program: expected benefits, contested boundaries," *Soc. Theory Heal.*, vol. 21, no. 4, pp. 368–387, 2023, doi: 10.1057/s41285-022-00186-4.

[39] M. J. Fleury, A. N. Ngui, J. M. Bamvita, G. Grenier, and J. Caron, "Predictors of healthcare service utilization for mental health reasons," *Int. J. Environ. Res. Public Health*, vol. 11, no. 10, pp. 10559–10586, 2014, doi: 10.3390/ijerph111010559.

[40] E. Vingilis, T. Wade, and J. Seeley, "Predictors of adolescent health care utilization," *J. Adolesc.*, vol. 30, no. 5, pp. 773–800, 2007, doi: 10.1016/j.adolescence.2006.10.001.

[41] L. L. Andersen, "Promoción de la salud y prevención de enfermedades crónicas en el lugar de trabajo," *Annu. Rev. Public Health*, vol. 45, no. 1, pp. 337–357, 2024.

[42] K. Piha, H. Sumanen, E. Lahelma, and O. Rahkonen, "Socioeconomic differences in health check-ups and medically certified sickness absence: A 10-year follow-up among middle-aged municipal employees in Finland," *J. Epidemiol. Community Health*, vol. 71, no. 4, pp. 390–395, 2017, doi: 10.1136/jech-2016-208185.

[43] B. P. Kmch and B. P. Koirala, "Health Assembly Multisectoral Action Plan on the Prevention and Control of NCD in Nepal," 2014.

[44] E. C. Green, E. M. Murphy, and K. Gryboski, "The Health Belief Model," in *The Wiley Encyclopedia of Health Psychology: Biological Bases of Health Behavior: Volume 1, The Social Bases of Health Behavior: Volume 2, Clinical Health Psychology and Behavioral Medicine: Volume 3, Special Issues in Health Psychology: Volume 4*, Department of Anthropology, The George Washington University, Washington, DC, United States: wiley, 2020, p. V2:211-V2:214. doi: 10.1002/9781119057840.ch68.

[45] C. J. Carpenter, "A meta-analysis of the effectiveness of health belief model variables in predicting behavior," *Health Commun.*, vol. 25, no. 8, pp. 661–669, 2010, doi: 10.1080/10410236.2010.521906.