

Health Risks and Roles in Medical Surveillance among Nurses Working in BPO Sectors in Iloilo City, Philippines

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Abstract:

The increasing globalization of business processes has led to the expansion of business process outsourcing (BPO) sectors, particularly in countries like the Philippines. Nurses, a significant group in the workforce in these sectors, are tasked with providing medical and health-related services. However, nurses in the BPO sector face health risks such as occupational hazards, ambiguous OSH regulations and procedures, and limited OSH knowledge and engagement in medical surveillance. This descriptive-comparative research investigated nurses' health risks and roles in medical surveillance in the BPO sectors of Iloilo City, Philippines. A total of 49 nurses from 69 BPO firms in Iloilo City were the study's respondents. According to BPO firm profiles, there were significant differences between nurses' health risks and roles in medical surveillance. To prevent health risks and improve the roles in medical surveillance among nurses in the BPO sector, management must actively develop, innovate, and evaluate their occupational safety and health (OSH) policies and programs, as well as empower their nurses through professional development and training.

Keywords: Occupational Health Nursing; Business Processing Outsourcing; Health Risk; Medical Surveillance

1. Introduction

Economic globalization and a supportive political environment have significantly aided the expansion of the business processing outsourcing (BPO) sector in Iloilo City, Philippines. The industry created thousands of jobs in the locality. It is now one of the most significant contributors to the locality's internal revenue allotment (IRA). As the business matures, the rapid and competitive global advancement in information technology brings a fresh wave of development to the BPO sector, generating higher demands for fundamental health programs and services for workers.

The BPO sector requires optimal working conditions to ensure employees' welfare. The Philippines' Occupational Safety and Health (OSH) Standards mandate hiring a healthcare team, including first aiders, nurses, doctors, and dentists, to provide occupational health services. Particularly, nurses play an essential role in resource preservation and high-quality program delivery. However, they face health hazards, vague policies, and inadequate awareness of worker rights, posing a threat to their effectiveness.

The nurse, in coordination with the healthcare team, conducts medical surveillance to detect and manage health risks in the workplace. It includes a periodic assessment of workers' health and workability, early detection of adverse health effects from occupational exposures, and intervention to prevent further deterioration in health status or workability [1]. As a result, surveillance provides feedback to the healthcare team and the employer regarding the effectiveness of current workplace health programs and services. Surveillance is an important core activity in occupational health practice [2]. A study by Lele (2018) argued that surveillance data reveal trends or emerging workplace hazards and illness patterns. Effective surveillance requires preventive, corrective, and intervention efficacy assessment.

Although nurses are integral to health screening, prevention, and surveillance, data regarding their autonomy and level of involvement are scarce. Their role evolves as they consider workplace requirements, government regulations, environmental data, and evidence-based health services.

As vital as it seems, there are only a few studies on nurses' health risks and their roles in medical surveillance. Locally, there are limited studies conducted on "Health Risks and Roles in Medical Surveillance among Nurses Working in BPO sectors in Iloilo City, Philippines."

1.1 Background of the Study

The BPO sector in the Philippines has emerged as one of the most essential industries in the country, quickly closing in on the economic contributions from migration and the inflow of foreign remittances [3]. The rise of the Philippine BPO sector provided large-scale employment, and it has become the second-largest contributor after remittances from Filipino workers abroad. In fact, the BPO industry has experienced a remarkable threefold growth in its worldwide market share, ascending from 4 percent in 2004 to 12.3 percent in 2014. This upward trend was expected to persist until 2020, at which point the sector's market share was projected to attain 19 percent. [4]. In 2009, the National Statistical Coordination Board of the Philippines revised the Philippine Standard Industrial Classification and included the BPO under administrative and support service activities, specifically call centers and other related activities. The BPO sector was further classified as call center activities (voice) and back-office operation activities (non-voice).

The workforce in the BPO sector is growing, which indubitably impacts occupational health. According to the Philippine Statistics Authority (PSA) 2019/2020 Integrated Survey on Labor and Employment (ISLE), workers engaged in administrative and support service activities, including the BPO sector, had the second most significant share of cases with work-related diseases. Furthermore, back pain was the most common work-related illness experienced by workers. In recent years, more and more scholars have started to pay attention to employees' occupational health risks, which are long-term, hidden, and easily ignored problems [5].

Furthermore, the survey revealed that establishments did not consider medical surveillance an everyday activity in the workplace. Posting safety signs or warnings was typically the most frequently done activity. At the same time, other significant measures and activities commonly conducted were regular inspection and maintenance of equipment, mechanical and electrical facilities, emergency response preparedness activities for earthquakes, fires, and chemical spills, and organizing safety and health committees.

Moreover, the survey found that medical surveillance policies and programs did not rank among the top occupational safety and health policies and programs implemented in the workplace. The main occupational safety and health policies and programs focused on accident prevention, fire prevention and control, anti-sexual harassment, and emergency preparedness and response. Firms must recognize the importance of medical surveillance as a preventative approach to program implementation, which may provide better yields than mere awareness of health risks or the effects of occupational exposures.

As a result, this study aimed to assess and synthesize available literature and generate survey data on nurses' health risks and roles in medical surveillance, thereby providing a clear understanding of the current situation in the BPO sector.

1.2 Framework of the Study

The researcher categorized the input variables in this study according to the profiles of the nurses and BPO firms, as shown in the first box in Figure 1. The nurse's profile included sex, age, civil status, educational attainment, and nursing experience. In contrast, the BPO firm's profile included the years of firm existence and the number of workers. Related literature revealed the relationships between a firm's characteristics, particularly years of firm existence and the number of workers, and their effect

on organizational activities. Thus, assessing the respondents' profiles regarding their current years of firm existence and the number of workers provided an outlook on their capacity to evaluate health risks and conduct medical surveillance activities.

The second box in Figure 1 illustrates the process, which involves two variables: 1) Nurses' Health Risks and 2) Nurses' Role in Medical Surveillance. Currently, numerous pieces of literature on occupational health and organizational management discuss and explore these two variables. Complex environments, variable and long rotating shifts, and exposure to various occupational risks characterize the work of nurses [6]. Exploring health risks and safeguarding health workers boosts efficiency, job satisfaction, and retention. Medical surveillance is a critical component of occupational health programs that necessitates a team effort, with occupational nurses playing a key role. Implementing effective surveillance promotes employee health, a fundamental concept in occupational health nursing.

The third box in Figure 1 displays the expected outcome, which focused on proposing an effective training program for company nurses to address their health risks and their roles in conducting medical surveillance in the workplace. Training goals need to include improving workers' understanding of the specific hazards in their work environment, the morbidity and mortality risks posed by exposure to these hazards, the political, economic, and social contexts of work that determine the level of risk deemed acceptable for workers, and the extent to which workers participate in decision-making about the acceptability of these risks [7].

The study was based on a theory relevant to organizational systems' performance. Dan Petersen's accident/incident theory speculates that firms' OSH systems may falter due to the following factors: Management fails to establish a comprehensive policy, fails to clearly define OSH responsibilities and authority, and either ignores or pays insufficient attention to OSH procedures such as measurement, inspection, correction, and investigation [8]. Goetsch (2011) argued that inadequate orientation and OSH training for employees lead to accidents resulting in injuries and illnesses.

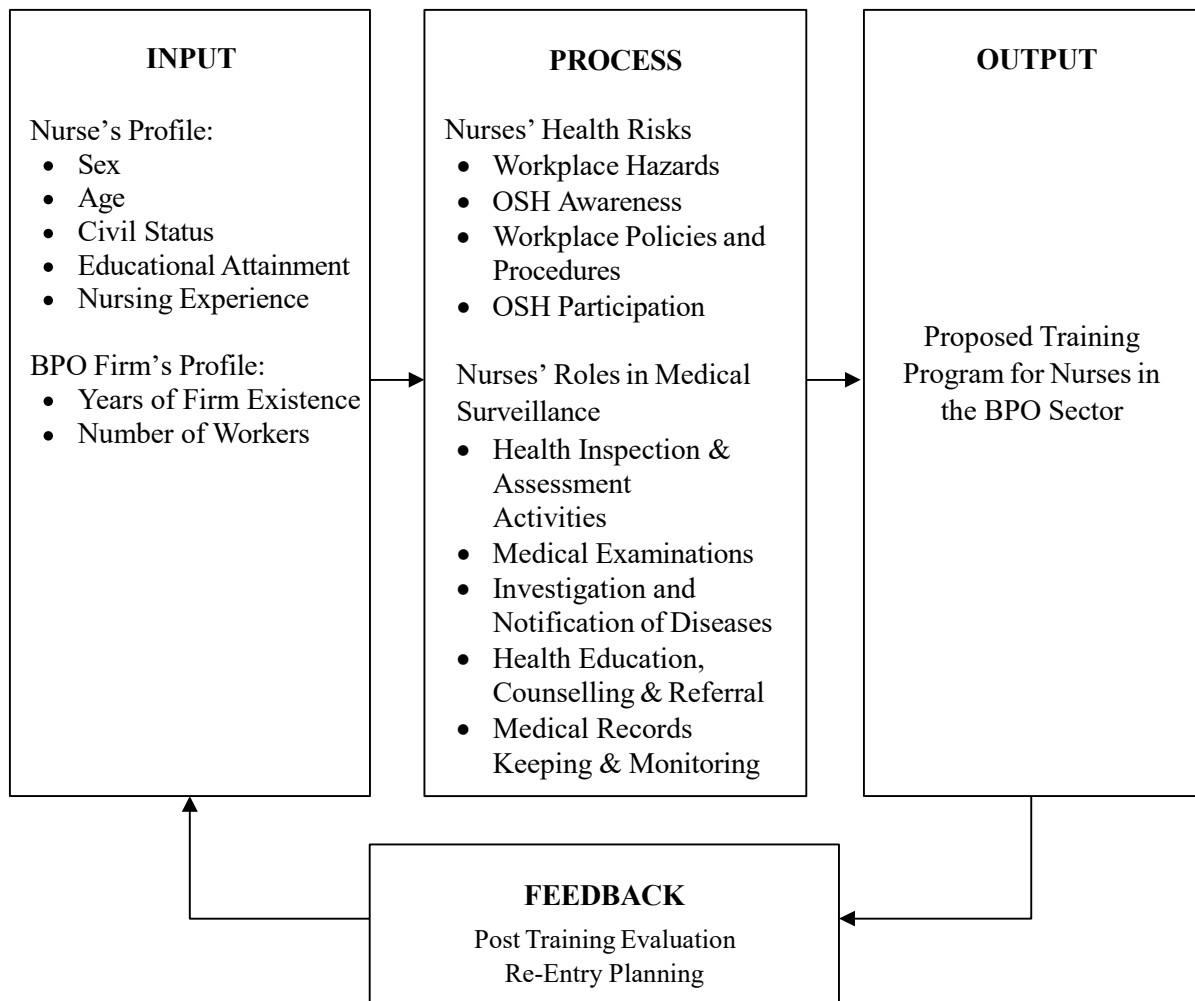


Figure 1: Framework of the Study

1.3 Statement of the Problem

Using identified profiles and dimensions, the study investigated the health risks and roles of nurses in medical surveillance. Furthermore, the study aimed to determine if there were any significant differences across the entire spectrum. Finally, the researcher proposed a training program as a sustainable intervention to enhance the working conditions and medical surveillance skills of nurses in the BPO sector of Iloilo City, Philippines.

Specifically, it attempted to answer the following questions:

1. What is the nurse's profile in terms of:
 1. Sex
 2. Age
 3. Marital Status
 4. Educational Attainment
 5. Nursing Experience
2. What is the BPO firm's profile in terms of:
 1. Years of Firm Existence
 2. Number of Workers
3. What is the level of nurses' health risks in terms of the following dimensions:
 1. Workplace Hazards
 2. OSH Awareness
 3. Workplace Policies and Procedures

4. OSH Participation
4. Is there a significant difference in the level of nurses' health risks in terms of:
 1. Respondent Profiles
 2. Firm Profiles
5. What is the level of roles in medical surveillance among nurses in terms of the following dimensions:
 1. Health Inspection and Assessment Services
 2. Medical Examinations
 3. Investigation and Notification of Diseases
 4. Health Education, Counselling, and Referral
 5. Medical Records Keeping & Monitoring
6. Is there a significant difference in the level of roles in medical surveillance among nurses in terms of:
 1. Respondent Profiles
 2. Firm Profiles
7. What training program can be proposed to address the nurses' health risks and roles in conducting medical surveillance in the workplace?

1.4 Hypothesis of the Study

With the previous questions as base, the researcher examined the following hypotheses:

1. There is no significant difference in the level of nurses' health risks in terms of respondents' and BPO firms' profiles.
2. There is no significant difference in the level of nurses' roles in medical surveillance in terms of respondents' and BPO firms' profiles.

2. Literature Review

2.1 Foreign Literature

All healthcare workers, including healthcare professionals, face occupational hazards, according to the World Health Organization (WHO) [9]. Nursing is an occupational hazard, with nurses exposed to a variety of risks, such as infectious diseases, toxic substances, back injuries, radiation, stress, shift work, and violence. Healthcare scholars and practitioners are working to raise awareness of these risks and the importance of workplace health and safety among this population.

In recent years, most researchers have debated that a truly healthy workplace is one where employees, managers, and senior executives work together to improve workers' physical and mental health and safety while simultaneously strengthening the organization [10]. Since most workers spend most of their day at work, legal rules, programs, and practices that affect health-related habits and conditions establish a healthy workplace.

Workplace health promotion is crucial, offering on-the-job exercise and health-related activities. Employers can provide educational programs, tools, and supportive environments for healthy behaviors, as workers spend most of their days at work. Successful workplace health programs exist. In 2010, the CDC Community Preventive Services Task Force in the United States found that comprehensive workplace health programs improve health behaviors (such as physical activity and not smoking), biometric measures (such as blood pressure and cholesterol), workers' overall health risk profile, medical use, and productivity [11].

Medical surveillance assesses workers exposed to health risks during job activities, evaluating the effectiveness of prevention policies and identifying potential health issues caused by hazardous

situations. The International Labour Organization (ILO) defines medical surveillance as an approved medical practitioner conducting a systematic activity as part of overall health surveillance, according to the objectives and principles of the Occupational Health Services Recommendation, 1985 (No. 171). Medical surveillance should incorporate health complaints and client examinations to detect adverse effects at an early stage. To reduce illnesses and injuries, comprehensive surveillance programs monitor employee health, with the primary goal of identifying and eliminating health risks. The ILO mandates medical surveillance to address health risks to workers, provide feedback to employers, and ensure their protection from harmful chemicals, as advised by occupational health professionals.

2.2 Local Literature

The Philippines, a major global source of competitive nurses, faces workplace hazards in healthcare settings. Despite numerous laws and regulations, Filipino nurses still face health and personal risks, according to the PSA-ISLE for 2019/2020. According to the data, workers engaged in administrative and support service activities, including the BPO sector (24.3%), gained second place for industries with the most significant share of cases with work-related diseases. The manufacturing industry had the most significant share of cases (31.8%), followed by human health and social work activities, except for public health (9.8%). Furthermore, back pain was the most common work-related disease experienced and suffered by workers, accounting for roughly 39.0 percent of all cases. Other prevalent occupational diseases include neck-shoulder pains (12.1%) and occupational dermatitis (9.4%).

On the other hand, the 2019/2020 PSA-ISLE also revealed that medical surveillance was not among the most popular OSH activities or measures carried out by businesses in the Philippines. Generally, posting safety signage or warnings was the most common activity conducted among establishments at 89.7%. Next, disseminating information materials on safety and health at 83.9%. Other top measures and activities usually conducted were regular inspection and maintenance of equipment, mechanical and electrical facilities at 83.2%; conducting emergency response preparedness activities for earthquakes, fire, and chemical spills, among others at 82.4%; and organizing safety and health committees at 82.0%.

The Labor Code of the Philippines emphasizes labor as a vital social and economic force, requiring a safe, healthy workforce for nation-building, and the Department of Labor and Employment enforces these provisions. The Department of Labor and Employment (DOLE) is the governing body of labor and employment in the Philippines. Its responsibilities include addressing health and safety concerns in the BPO and healthcare sectors. In 2008, DOLE released Department Circular No. 1, providing guidelines for occupational safety and health (OSH) in call center businesses. The circular mandates preventive control measures, education, training, and work environment interventions to strengthen safety and health committees.

The Philippines' Bureau of Working Conditions uses the Employer's Work Accident/Illness Report and Annual Medical Report for reporting health risk cases, but due to poor industry cooperation, OSH reporting has a low compliance rate. Furthermore, limited local literature exists on the occupational health and safety conditions of BPO industries in the Philippines, with limited published studies available.

In 2018, the Philippine Government passed Republic Act 11058, enhancing occupational safety and health (OSH) standards. This law mandates employers to inform workers about hazards, provide training, and comply with regular OSH administrative reporting. Non-compliance can result in administrative penalties ranging from PHP 20,000 to PHP 100,000 daily.

2.3 Foreign Studies

Nurses are confronted with various kinds of occupational hazards due to their nature of work [12]. All organizations should adopt future initiatives and provide a suitable occupational infrastructure to enhance the health and well-being of their workers. One study recommended the need to develop and

carry out special educational programs for nurses to enhance their knowledge regarding occupational health hazards [13]. Another study asserted that nurses must understand occupational risks and dangers. A large proportion of occupational hazards in the workplace can be prevented or controlled through different measures, such as safe work practices, appropriate tools, proper staffing, minimizing workload and provision of information related to occupational health hazards [14].

Nurses' health is crucial, necessitating international standards, economic policies, and better work-life balance. Understanding precariousness and monitoring progress towards health equity are essential. [15]. Health care professionals, including nurses, are incapable of providing quality care in the absence of good working conditions [16].

As part of its broad scope of practice, occupational health nursing includes surveillance, screening, and preventative measures. The scope of professional health nursing practice is broad and includes surveillance, screening, and prevention activities [17]. According to Rogers, although there has been some dispute regarding accountability, it is indisputable that occupational health nurses have a crucial responsibility in supervising, managing, executing, and assessing these programs. According to her prior research, 71% of occupational health nurses were responsible for program management and most independently conducted surveillance, screening, and prevention duties. The reported percentage of physician oversight for these activities varied between 0% and 8%. The results of this study affirm the autonomy of occupational health nursing practitioners in carrying out preventive, screening, and surveillance duties, while acknowledging the value that all practitioners bring to the workforce in maintaining good health.

2.4 Local Studies

For the past 30 years, the Philippines has been reforming its healthcare system to improve the situation, focusing on health service delivery and health regulation. Nurses' health is influenced by the broader social, economic, and political systems, as well as the redistribution of power relations that creates new policies regarding the labor market and the welfare state [18]. Nurses and other healthcare workers can only provide quality services if their work environment provides adequate conditions to support them [19]. They have to safeguard consistency in all learning opportunities in order to effectively operate within the boundaries of their professional practice, with a particular focus on safety and quality.

Feliciano et al. (2019) highlighted the need for experts to guide nurses in evidence-based practice and maintain quality care in Philippine healthcare. They found that marital status and service length significantly influence nurses' competency levels. Factors such as the relationship between nurse and physician, advancement opportunities, autonomy, leadership, and task requirements also impact nurses' job satisfaction and health conditions. In one study, when viewing the physical environment, the participants included ventilation as essential to feeling refreshed and performing well, urging people to prioritize ventilation as much as sanitation and clean water as a primary health measure because inadequate ventilation can result in a higher risk of contracting diseases [19].

3. Methodology

3.1 Method of Study Used

This study employed the descriptive-comparative method. Descriptive-comparative research studies have the following characteristics: no alteration of an independent variable, no random task for groups, and no enclosure of a control or comparison group [20]. This design involved a structured process for data collection, statistical treatment, and careful analysis and description of the results' implications.

3.2 Population, Sample Size and Sampling Technique

The study was conducted in Iloilo City, a first-class, highly urbanized city located in the Western Visayas region of the Philippines. It is the capital city of Iloilo Province, which is geographically

situated and has a politically independent government and administration. According to the Iloilo City Business Permit and Licensing Office records as of May 19, 2023, the city has 69 BPO firms and approximately 80 nurses.

To ensure that every nurse employed by business process outsourcing (BPO) enterprises in Iloilo City had an equal opportunity of being selected as a sample member from the larger population, simple random sampling was utilized in this study. Simple random sampling works well when the population of interest is somewhat homogenous. Surveys and quantitative research designs often utilize simple random sampling [21]. Every individual in a population receives an equal chance of selection as a respondent through simple random sampling, resulting in impartial and precise estimates.

3.3 Description of Respondents

The study's target population was the appointed or employed company nurses in Iloilo City's BPO firms. These are the nurses, appointed regardless of employment status and shifting, tasked with providing nursing services for employees within the BPO firm assigned.

3.4 Research Instrument

The survey instrument was an adaptation of the Philippines Department of Labor and Employment's national OSH indicator checklist and the OSH Standards Rule 1960: Occupational Health Services [22], the Nurse Practitioners' Responsibility for Health Surveillance Activities of Bonnie Rogers [17], and the OHS Vulnerability Measure developed by the Institute for Work & Health in Canada [23].

The researcher valued the confidentiality of personal data and used and protected personal data to obtain the consent of respondents, per the Data Privacy Act of 2012 (DPA), its Implementing Rules and Regulations (IRR), other issuances of the National Privacy Commission (NPC) and other relevant laws of the Philippines. As a rule, the researcher did not share personal data with third parties except as necessary for adequately executing processes related to a declared purpose or the use or disclosure that is reasonably necessary, required, or authorized by or under law.

The questionnaire comprised four (4) parts:

Part I, the respondent's profile, contained demographic inquiries such as sex, age, civil status, education, and experience. The initial section of the questionnaire aimed to accurately depict the nurses, their demographics, and the characteristics under investigation.

Part II, the BPO firm's profile, contained vital statistics regarding its age and number of workers. The enterprise under study reflected its characteristics in this part of the questionnaire.

Part III, the proper questionnaire for nurses' health risks, consisted of 25 items categorized as workplace hazards, OSH awareness, workplace policies and procedures, and OSH participation. This section collected responses about nurses' health risks, depicting their levels of exposure to health risks leading to illness.

Part IV, the questionnaire proper for nurses' roles in medical surveillance, consisted of 30 items relating to health inspection and assessment activities, medical examinations, investigation and notification of diseases, health education, counseling and referral, and medical records keeping and monitoring. This section collected responses about nurses' roles in medical surveillance, depicting their levels of practice and independence in conducting medical services activities.

3.5 Data-Gathering Procedure

The researcher endorsed a survey instrument to the BPO firms in Iloilo City from June 1 to 15, 2023. The researcher provided explanations about the research's purpose, participants' rights, confidentiality, and access to the results. Respondents agreed to a consent statement, demonstrating their willingness

to cooperate without coercion. Following the deadline, the researcher tallied and subjected the collected data to statistical treatment and analysis.

3.6 Statistical Treatment of Data

The data gathered for this study were subjected to appropriate computer-processed statistics employing the Statistical Package for the Social Sciences software (SPSS). All inferential statistics were set at a (.05) alpha level. Also, the data were encoded and analyzed both quantitatively and qualitatively.

The following statistical tools that were used to interpret the data were the frequency count, standard deviations, means, t-Test for the Independent Sample test, and One-way ANOVA.

The means and standard deviations were employed in the descriptive analysis to ascertain whether the levels of nurses' health risks and their roles in medical surveillance were homogeneous or heterogeneous. The following scale, with corresponding descriptions and interpretations, was used:

SCALE	DESCRIPTION	VERBAL INTERPRETATION
4.50 – 5.00	Always	Very High
3.50 – 4.49	Often	High
2.50 – 3.49	Sometimes	Moderate
1.50 – 2.49	Rarely	Low
1.00 – 1.49	Never	Very Low

Frequencies and percentage. These statistical tools were used to determine the number of respondents to specific independent sample size characteristics.

The Mean and Standard Deviation. These statistical tools were used to determine the respondents' levels of risk and roles in medical surveillance.

For inferential analysis, the t-Test for Independent Sample and One-Way Analysis of Variance (One-Way ANOVA) were employed as inferential statistical tools.

t-Test for Independent Sample test. The test determined the relevance of differences in the levels of health hazards and roles in medical surveillance when respondents' profiles were categorized.

One-Way Analysis of Variance (One-Way ANOVA). The significance of the differences in the respondents' levels of health risks and roles in medical monitoring when grouped into profiles with three or more categories was determined using the F test.

The researcher utilized the table below for the mean range, verbal description, and interpretation of the level of health risks among nurses in the BPO sectors in Iloilo City, Philippines.

MEAN RANGE	VERBAL DESCRIPTION	QUALITATIVE INTERPRETATION
4.50 – 5.00	Very High	The level of nurses' health risks is very high, which means the nurses have a great deal of exposure to workplace factors that may result in an illness.
3.50 – 4.49	High	The level of nurses' health risks is high, which means the nurses have quite a bit of exposure to workplace factors that may result in an illness.
2.50 – 3.49	Moderate	The level of nurses' health risks is moderate, which means the nurses have some influence of exposure to workplace factors that may result in an illness.

1.50 – 2.49	Low	The level of nurses' health risks is low, which means the nurses have little exposure to workplace factors that may result in an illness.
1.00 – 1.49	Very Low	The level of nurses' health risks is very low, which means the nurses have very little exposure to workplace factors that may result in an illness.

The researcher utilized the table below for the mean range, verbal description, and interpretation of the level of roles in medical surveillance among nurses in the BPO sector of Iloilo City, Philippines.

MEAN RANGE	VERBAL DESCRIPTION	QUALITATIVE INTERPRETATION
4.50 – 5.00	Very High	The level of nurses' roles in medical surveillance is very high, which means the nurses have a great deal of practice and independence in conducting medical surveillance activities.
3.50 – 4.49	High	The level of nurses' roles in medical surveillance is high, which means the nurses have quite a bit of practice and independence in conducting medical surveillance activities.
2.50 – 3.49	Moderate	The level of nurses' roles in medical surveillance is moderate, which means the nurses have some influence on practice and independence in conducting medical surveillance activities.
1.50 – 2.49	Low	The level of nurses' roles in medical surveillance is low, which means the nurses have little practice and independence in conducting medical surveillance activities.
1.00 – 1.49	Very Low	The level of nurses' roles in medical surveillance is very low, which means the nurses have very little practice and independence in conducting medical surveillance activities.

4. Findings and Discussions

Table 1: Distribution of Respondents According to Profile

Nurses' Profile	Frequency n (%)	
Sex		
Female	42	(85.7)
Male	7	(14.3)
Total	49	(100.0)
Age		
30 years old and below	35	(71.4)
Above 30 years old	14	(28.6)
Total	49	(100.0)
Civil Status		
Single	45	(91.8)

Married	4	(8.2)
Total	49	(100.0)
Educational Attainment		
Bachelor's Degree	48	(98.0)
Master's Degree	1	(2.0)
Total	49	(100.0)
Nursing Experience		
Less than 1 year	18	(36.7)
1-3 years	29	(59.2)
4-6 years	2	(4.1)
Total	49	(100.0)

Table 1 shows the respondents representing the nurses working in BPO sectors in Iloilo City, Philippines. This section focused on the health risks and roles in medical surveillance among nurses when classified according to sex, age, civil status, educational attainment, and nursing experience. During the data gathering, the researcher observed that some BPO firms did not hire or appoint a nurse because their workforce was less than 51. This reason is due to the firm's knowledge about the requirements for nurses based on the ratio of the number of workers in pursuance of Republic Act No. 11058. Also, some BPO firms had already closed, and some can no longer be located. At the same time, the rest did not respond to the invitation to conduct the research in their establishment. As a result, a total of 49 nurse representatives from various BPO firms in Iloilo City responded and were included in this study.

Regarding sex, the majority of the respondents were female. As to age, more than half belonged to the population less than 30 years old. For civil status, the respondents were primarily single. When categorized according to the respondents' educational attainment, nearly all respondents were bachelor's degree holders and only one declared to have a master's degree in nursing, and therefore nursing education will no longer be treated for further analysis due to insufficient data for treatment of variance. Finally, most respondents who answered the survey instrument have already accumulated 1-3 years of nursing experience.

Table 2: Distribution of BPO Firms According to Profile

BPO Firms' Profile	Frequency n(%)	
Years of Firm Existence		
1-3 years	10	(20.4)
4-6 years	25	(51.0)
7 years and more	14	(28.6)
Total	49	(100.0)
Number of Workers		
Less than 100 workers	9	(18.4)
100 to 250 workers	5	(10.2)
251-500 workers	9	(18.4)
more than 500 workers	26	(53.1)
Total	49	(100.0)

Table 2 shows the participating BPO sectors in Iloilo City when classified according to years of firm existence and number of workers. Regarding years of firm existence, most respondents worked in BPO firms that were operational for 4-6 years. In providing further variance, the BPO firms with years of

firm existence ranging from 7-9 and 10 years and more were consolidated into one category as 7 years and more for the analysis and treatment of the data. Regarding the number of workers, most of the respondents worked for participating BPO firms in the category of more than 500 workers.

Table 3: Level of Health Risks among Nurses

Variables	Mean	SD	IN
A. Working Hazard	1.34	0.32	VL
B. OSH Awareness	1.46	0.42	VL
C. Workplace Policies and Procedures	1.45	0.55	VL
D. OSH Participation	1.30	0.42	VL
General Mean	1.39	0.37	VL

Note: 1.00-1.49 Very Low (VL), 1.50-2.49 Low (L), 2.50-3.49 Moderate (M), 3.50-4.49 High (H), 4.50-5.00 Very High (VH)

Table 3 shows the level of health risks among nurses in BPO firms of Iloilo City is very low which means the nurses have very little exposure to workplace factors that may result in an illness.

Table 4: Difference in the Level of Health Risks among Nurses

Variables	Mean Rank	U-value	W-value	z-value	p-value
Sex					
Female	24.26	116.0	1019.0	-0.890	0.373
Male	29.43				
Age					
30 years old and below	24.43	225.0	855.0	-0.445	0.656
Above 30 years old	26.43				
Civil Status					
Single	25.69	59.0	69.0	-1.138	0.255
Married	17.25				
Nursing Experience		H-value			p-value
Less than 1 year	27.58				
1-3 years	22.38	3.733			0.155
4-6 years	39.75				

Note: Significant if $p\text{-value} \leq 0.05$. Reject H_0 .

Table 4 shows that there is no significant difference in the level of health risks among nurses working in the BPO sectors in Iloilo City when taken as a whole and when grouped according to respondents' selected profile, such as sex ($u=116.0$, $w=1019.0$, $z=-0.890$, $p=0.373$); age ($u=225.0$, $w=855.0$, $z=-0.445$, $p=0.656$); civil status ($u=59.0$, $w=69.0$, $z=-1.138$, $p=0.255$); and nursing experience ($H=3.733$, $p = 0.155$), therefore, the null hypothesis was not rejected at the 5% level of significance. The result indicated that the level of health risks among nurses was statistically the same when grouped according to sex, age, civil status, and nursing experience.

The result revealed that variations in nurses' sex, age, civil status, and experience do not entirely differ in terms of exposure to and impact of negative health outcomes caused by various health risks in the workplace. Most studies on occupational health and safety have demonstrated that insufficient or nonexistent OHS systems are the primary cause of the high rates of health risks. As a result, the implementation of a management system that is deemed "effective" will lower the incidence of occupational illnesses and injuries and increase system safety [24].

Table 5: Difference in the Level of Health Risks among Nurses When Grouped according to Selected BPO Firms' Profile Variables

Variables	Mean Rank	H-value	p-value
Years of Firm Existence			
1-3 years	35.80		
4-6 years	22.36	7.258	0.027
7 years and more	22.00		
Number of Workers			
Less than 100 workers	38.50	10.031	0.018
100 to 250 workers	21.39		
251-500 workers	22.42		
More than 500 workers			

Note: Significant if p-value ≤ 0.05 . Reject Ho.

Table 5 shows that there was a significant difference in the level of health risks among nurses as a whole and when grouped according to selected BPO firms' profile variables such as years of firm existence (H=7.258, p=0.027); and number of workers (H=10.031, p = 0.018), therefore, the null hypothesis was rejected at the 5% level of significance. The result indicated that the level of health risk among nurses was statistically different when nurses were grouped according to years of firm existence and the number of workers. Further analysis was utilized to determine which group among the years of firm existence and the number of workers showed a significant difference.

Larger firms that receive both financial and managerial resources have a greater chance of surviving, expanding, and competing, according to empirical evidence that small firms in emerging economies have historically suffered from a dearth of technical and managerial expertise that hinders their performance [25]. Moreover, extensive research has demonstrated that emerging economies can present formidable obstacles for new enterprises seeking to enter the market. These challenges stem from institutional shortcomings, which manifest as stringent regulatory limits and limited access to financial markets [26].

Further studies recognized that business performance was measured in terms of size (number of employees) and proved to be a significant influential factor. Studies pointed out that bigger businesses can enjoy economies of scale as they can exploit available resources better than smaller businesses which leads to competitive advantage and better performance [27].

Table 6: Level of Roles in Medical Surveillance among Nurses

Variables	Mean	SD	IN
A. Health Inspection & Assessment Activities	4.33	0.45	H
B. Medical Examinations	4.36	0.60	H
C. Investigation & Notification of Diseases	4.43	0.60	H
D. Health Education, Counseling & Referral	4.70	0.40	VH
E. Medical Records Keeping & Monitoring	4.45	0.51	H
General Mean	4.33	0.45	H

Note: 1.00-1.49 Very Low (VL), 1.50-2.49 Low (L), 2.50-3.49 Moderate (M), 3.50-4.49 High (H), 4.50-5.00 Very High (VH)

Table 6 shows the level of roles in medical surveillance among nurses in BPO sectors of Iloilo City is high, which means the nurses have quite a bit of practice and independence in conducting medical surveillance activities.

Table 7: Difference in the Level of Roles in Medical Surveillance among Nurses When Grouped according to Selected Profile Variables

Variables	Mean Rank	U-value	W-value	z-value	p-value
Sex					
Female	26.54	82.5	110.5	-1.854	0.064
Male	15.70				
Age					
30 years old and below	26.03	209.0	314.0	-0.801	0.423
Above 30 years old	22.43				
Civil Status					
Single	24.18	53.0	1088.0	-1.359	0.174
Married	34.25				
Nursing Experience		H-value			p-value
Less than 1 year	20.64				
1-3 years	27.84	2.899			0.235
4-6 years	23.00				

Note: Significant if p-value ≤ 0.05 . Reject Ho.

Table 7 shows that there was no significant difference in the level of roles in medical surveillance among nurses when taken as a whole and when grouped according to respondents' selected profile, such as sex ($u=82.5$, $w=110.5$, $z=-1.854$, $p=0.064$); age ($u=209.0$, $w=314.0$, $z=-0.801$, $p=0.423$); civil status ($u=53.0$, $w=1088.0$, $z=-1.359$, $p=0.174$); and nursing experience ($H=2.899$, $p=0.235$), therefore, the null hypothesis was not rejected at the 5% level of significance. The result indicated that the level of roles in medical surveillance among nurses was statistically the same when grouped according to sex, age, civil status, and nursing experience.

The results showed that the nurses' roles are well established, primarily aimed at preventive health interventions and health promotions. This supports Rogers et al. (2000) argument that nurses are keenly familiar with the work, work processes, related hazards, and the health surveillance and screening parameters needed to protect and monitor worker health [17]. The results also revealed that the nurses were compliant to their duties and responsibilities to provide medical surveillance activities for the early detection and management of occupational and work-related diseases as per the Republic Act No. 11058 and the OSH Standards of the Philippines [22].

Table 8: Difference in the Level of Roles in Medical Surveillance among Nurses When Grouped according to Selected BPO Firms' Profile Variables

Variables	Mean Rank	H-value	p-value
Years of Firm Existence			
1-3 years	11.00		
4-6 years	30.68	13.710	0.001
7 years and more	24.86		
Number of Workers			
Less than 100 workers	12.44		
100 to 250 workers	35.40	15.304	0.002
251-500 workers	17.56		
more than 500 workers	29.92		

Note: Significant if p-value ≤ 0.05 . Reject Ho.

Table 8 shows that there was a significant difference in the level of roles in medical surveillance among nurses as a whole and when grouped according to selected BPO firms' profile variables such as years of firm existence ($H=13.710$, $p=0.001$); and number of workers ($H=15.304$, $p = 0.002$). Therefore, the null hypothesis was rejected at the 5% level of significance. The result indicated that the level of roles in medical surveillance among nurses was statistically different when nurses were grouped according to the years of firm existence and the number of workers. Further analysis was utilized to determine which group among the years of firm existence and the number of workers showed significant differences.

5. Conclusions

The BPO sector in Iloilo City revealed very low levels of health risks among nurses, which attests that the nurses have very little exposure to workplace factors that may result in illness. Per OSH local regulations, the organization's sound OSH policies and programs, as well as the active efforts of key stakeholders in the area, are what have led to this. While BPO firms experiencing rapid expansion due to globalization and market demands should be flexible in expanding their OSH policies and programs to maintain their OSH culture, it has been observed that aging BPO firms with a larger workforce tend to increase the health risks of their nurses. This trend may be attributed to increased workplace factors and a narrower management focus on OSH, rather than prioritizing the growth of sales and profits. To lower factors that may affect health and be able to deliver good care, it's crucial to create friendly workplaces that promote teamwork and empower nurses through professional development and training. Moreover, the presence and correct ratio of nurses provide the BPO firm with the needed capabilities and commitment to ensuring a safer and healthier work culture. With this effective method, nurses can provide evidence-based information and skills throughout the development and implementation of vital workplace health policies and programs. The problem of retaining experienced healthcare staff has heightened the need to look at various aspects of work and the work environment, which affect the level of satisfaction and, in turn, influence the quality of service [28].

On another note, BPO firms in Iloilo City revealed the current high levels of nurses' roles in medical surveillance, which means the nurses have quite a bit of practice and independence in conducting medical surveillance activities. In addition to acknowledging the contributions made by all providers to a healthy workforce, the study's findings confirm the autonomous functioning of occupational health nurses in the context of monitoring, screening, and preventative efforts [17]. We have observed anecdotally for years the occupational health nurses' participation in managing and carrying out health monitoring, screening, and preventative activities, and the study confirms this. Nurses with adequate support, training, and independence to practice their craft were able to provide the needed OSH services for a healthier workplace. A sound surveillance and screening program will safeguard the workforce and honor the contributions of healthcare providers.

5.1 Recommendations

To prevent health risks for nurses in the BPO sector, management must actively develop, innovate, modify, and evaluate their occupational safety and health (OSH) policies and programs. Nurses, as members of the safety and health committee, can enhance trust and communication, leveraging each party's expertise. The right thing to do is to educate workers about all aspects of OSH and give them the skills to look after themselves. One way to improve OSH is through effective training, and company management must actively reduce the number of potential hazards and risks in the workplace.

To enhance the medical surveillance capabilities of company nurses within the BPO sector, it is crucial to identify the most effective surveillance patterns and design and evaluate technologies that can support nurses in carrying out their surveillance duties proficiently. BPO firms can use a variety of strategies to enhance the nurses' capacity to manage workplace health risks and conduct effective medical surveillance activities.

A training program that incorporates three key elements, namely behavioral-based OSH, people-based OSH, and cultural OSH competitiveness, will effectively address the needs of nurses and the BPO firm, promoting a risk-free workplace and enhancing the practice and independence of nurses in providing essential healthcare services. Subsequently, post-training evaluation and re-entry planning will require feedback. Evaluations will help in identifying any gaps in the training content or delivery method. This feedback is essential for continuous improvement of the training program. Evaluating training allows both trainers and learners to reflect on what was effective and what was not, fostering a cycle of continuous improvement [29].

6. Author's Contribution

The author contributed to the study's conception and analysis, revised the first draft, and read and approved the final manuscript.

7. Conflict of Interest

The author declared that they have no conflict of interest.

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