# Pre-Employment Health Screening For Nurses During Covid-19 Pandemic From Occupational Health Perspective: A Document Review

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Literature Review

# Pre-Employment Health Screening For Nurses During Covid-19 Pandemic From Occupational Health Perspective: A Document Review

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**Abstract**

*The COVID-19 pandemic presents a major challenge to the pre-employment health screening system for nurses looking for jobs. For this reason, a pre-employment screening system is needed that sort it easier for all parties (nurses as prospective employees, companies and company owners) in the health screening system. The objective is to offer a health screening system in the form of Remote Pre-employment Health Screening for nurses from the occupational health nursing (OHN) perspectives. The study used Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Analysis with qualitative descriptive methods. There were 702 documents were extracted from the Google search engine, of which 662 documents were removed due to ineligible. The other 40 documents matched the study topic were Google Scholar (n=18), Researchgate (n=12), PubMed (n=5) and others sources (n=5). The indicators were respondents (nurses), research methods (quantitative, document review, case study, and report), years (2016-2021), results (focus on pre-employment health screening), and language (English). Document search used the PICOT (Population, Intervention, Comparison, Outcome, and Time) model. The search keywords were pre-employment health screening, OHN, and Covid-19. The results projected (n=10) records were eligible for review but 6 documents met the study requirements (n=6). The findings show that the pandemic caused a disastrous impact on the nursing profession including the need to review the pre-employment health screening system. The findings of this study suggest a three in one formula for pre-employment health screening for nurses during pandemic-19, i.e. to make memorandum of understanding, to set health examination standard, and to create an electronic application.*

*Keywords: Pre-employment health screening, occupational health, occupational health, Covid-19*

## Introduction

More than 7000 hospitals, 10,000 health centers and tens of thousands of private clinics in the era of the Covid-19 pandemic need nurses, both as volunteers and permanent staff (Badan Pusat Statistik, 2020; ICN, 2020a). The obstacle is that the social distancing policy that is emphasized makes the pre-employment health screening system have to adjust to government regulations (HHS Government, 2020). Thousands of job opportunities for nurses have been available since the Covid-19 pandemic (ICN, 2020b). Hundreds of Covid-19 handling centers were established in 34 provinces which also require nurses in Indonesia (Syahrial, 2020). These job opportunities are not included in the medium and large size industrial sector. In 2017, there were 3.9 million new companies. As of April 26, 2020, the Government has issued industrial operating permits to 14,533 companies (Tukayo et al., 2021).

Those companies come from agro-industry, chemicals, pharmaceuticals and textiles, metal industries, machinery, tools and electronics, small, medium and large industries, as well as industrial areas, and industrial services (Tukayo et al., 2021). They need nurses to provide health

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services to their employees. Along with increasing job opportunities for nurses in the pandemic era, according to Government regulations related to the Covid-19 pandemic, it needs to be accompanied by prevention and health protection efforts for both existing employees and prospective employees (Kemenkes RI, 2018).

In terms of occupational health nursing, according to World Health Organization (WHO), the role of Occupational Health Nursing (OHN) nurses in the industry includes clinicians, nursing managers, mentors, educators, researchers and coordinators (WHO Regional office for Europe, 2001). As a clinician, the nurse's biggest duties include the pillars of fitness to work (FTW), health promotion, health surveillance, and case management (Tukayo & Hardy, 2020). In the field of FTW, a very common role for OH nurses is to conduct medical examinations for prospective employees or pre-employment health screening (Jurun et al., 2020). This process is no longer smooth since the Covid-19 pandemic. According to Fahrudin (Pers.Comm. 2021), the peak of Covid-19 cases that occurred at the company where he worked in Jakarta in July 2021 jumped 4 times. Novan (Pers. Comm. 2021), the Acehnese nurse also mentioned that in early September 2021 Aceh would become a red zone. ICN recorded the need for nurses during the pandemic increased sharply (ICN, 2021).

The increase occurred due to a large number of Covid-19 cases around the world. During the Covid-19 pandemic, on the one hand, there was a growth in employment opportunities for nurses. On the other hand, there are fears of infection so that during the pandemic there was a decrease in the number of nurses which reached 20% (International Council of Nurses, 2020). For those reasons, precaution is needed in recruiting new employees in the era of outbreak. There have been many nursing researchers explored Covid-19 related to workload and risks (Maxton et al., 2020). However, there are minimal discussions of research on health screening systems on nurses. Previous study mentioned pre-placement health screening for nurses is generally carried out in clinic of the workplace, except for overseas placements (Tukayo & Hardy, 2020). The types of examination are divided into three parts: filling out a health questionnaire, conducting a basic clinical examination, and additional investigation (AAOHN, 2004). Of the 3 parts of examinations, it is necessary to divide which examinations can allow the remote screening. This study is about pre-employment health screening for nurses during Covid-19 pandemic from occupational health perspective. The researchers used a document review method due various limitations during the pandemic, such as government restriction, fund, time and distance to meet all parties to be involved in the study. The objective of the study is during social distancing regulation of Covid-19 pandemic we tried to formulate the pre-employment health screening on nurses who were looking for job as healthcare workers from the view of occupational health nursing, the goal is to help reduce the risk of exposure to the business, existing workers, and the company's surroundings.

**Methods.**

The study used a document review method, and PRISMA Analysis. PRISMA strategy was used during the review process of four stages: identification, screening, eligibility and included. The first step taken by the researcher was to analyze the object of research in the form of finding answers to the problems faced related to pre-employment health screening for nurses during the Covid-19 pandemic, due to changes in government regulations. Secondly, in the screening stage we determined keywords in the literature search, namely pre-employment health screening, occupational health nurses, and Covid-19. They were needed to guide us to be more focused in findings the documents through a search on the Google search engines with time restrictions (for the last five years, 2016-202), key words (pre-employment health screening), job for nurses and the Covid-19 pandemic, 702 documents were obtained. The determination of the object was based on the topic chosen in this study so that it is more focused by using the PICOT (Population, Intervention, Comparison,

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Outcomes, and Time) model. The selected the topic and questions consisting of the population (P) which is OHN nurses, intervention (I) which is health screening, outcome (O) which is remote pre-employment screening system, and the time (T) which is Covid-19 pandemic. The indicators of the document review were respondents, methods, year of publication, results, and the language which helped researchers the filtering system in reviewing documents. The next stage was eligibility in which we determined the inclusion criteria i.e. respondents (occupational health nurses), the methods (quantitative, document review, case study, and report), the year of publication (from 2016 to 2021), the research results (focused on pre-employment health screening system) and the language used (English). The final stage in PRISMA strategy is Included in which we determined only selected articles to be reviewed.

The results of this study were presented in systematic, structured and logical discussion supported by findings and recommendations from previous researchers, in a flow that distinguishes the pre-employment screening between before and during the pandemic. It is a formula on how to apply pre-employment health screening for nurses during the epidemic. Through the stages arranged according to the PRISMA analysis, it helped researchers achieve objectives f this study. Given that pre-employment screening for nurses is not new, because during pandemic it takes a different flow.

## Results

### Study Selection

The study selection was extracted from the database. It contains database sources and the keywords in the below table:

**Table 1: Study Selection**

| Database | Keywords | | | Total |
|---|---|---|---|---|
| | Pre-employment health screening | OHN | Covid-19 | |
| Google Scholar | 7 | 5 | 6 | 18 |
| Research Gate | 3 | 3 | 6 | 12 |
| PubMed | 0 | 2 | 3 | 5 |
| Others | 1 | 1 | 3 | 5 |
| Total | 11 | 11 | 18 | 40 |

The table above shows the document search results where the database from Google Scholar dominates (18 documents or 45%), followed by Research Gate 12 documents (30%), PubMed 5 documents (12.5%), and from other sources 5 documents (12.5%). The documents screening result was based on the inclusion criteria to be eligible in the literature i.e. respondents (occupational health nurses), the methods (quantitative, document review, case study, and report), the year of publication (from 2016 to 2021), the research results (focused on pre-employment health screening system) and the language used (English).

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**PICOT Formula**

**Table 2: Results of PICOT Research Questions**

| P | I | C | O | T |
|---|---|---|---|---|
| **Population** | **Intervention** | **Comparison** | **Outcome** | **Time** |
| OH nurses who are doing the pre-employment health screening to nurses during Covid-19 pandemic. | Pre-employment health screening to new nurses during pandemic. | Pre-employment health screening process to nurses is supposed to be different from health screening in the normal time, due to some restriction or regulations. | Remote pre-employment health screening system by Occupational Health Nurses. | The era of the Covid-19 pandemic. |

The above table projects the result of PICOT research questions which were used to help the researchers formulate well-defined searchable questions. The same model was used by many researchers of clinical studies (Pandya, 2019). After implementing the PICOT model, we found 7 records eligible to be included for review (n=7) in the PRISMA Analysis.

**Prisma Analysis**

The following diagram is the result of PRISMA Analysis.

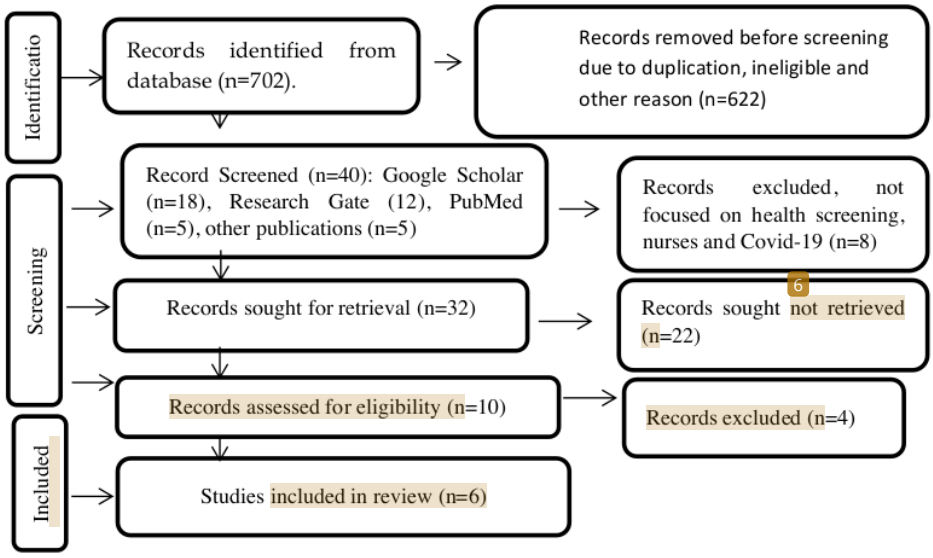


**Diagram 1: Prisma Analysis**

The diagram above shows four stages of document selection which include Identification, Screening, Eligibility, and Included. In the screening stage, initially 702 records (n=702) was obtained from the databases. The database was screened, then extracted by Google Scholar, Research Gate, and PubMed in which (n=662) records were removed due to irrelevant, duplication, incompatibility, and other reasons. The Screening stage is where 40 records (n=40) were obtained. The data was obtained after setting aside (n=662). Removal of unfocused documents (n=8) to gain records for retrieval (n=32). Then 10 records assessed for eligibility

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were (n=10) before excluding 3 documents (n=3) to obtain 7 records for review in the last stage (n=7). The last 7 and main records were filtered based on study selection, PICOT formula, and PRISMA analysis criteria to be summarized in Table 3.

**Reviewed Documents**

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The third step result is a summary table of selected journals from PRISMA analysis under Included category (Table 2). In the initial document search, 702 documents were obtained. After being screened, 40 documents were taken, while 662 documents were deemed inappropriate. Out of 40 documents which were assessed, 6 documents were eligible for review

**Table 3: Selected Document Summary**

| No | Author(s), Year, Title | Country | Methods | Output |
|---|---|---|---|---|
| 1 | [16]as et al., 2020, The Impact of the Coronavirus Pandemic on the Global Nursing Workforce | USA | Case Study | The finding suggested there is a possibility that the challenges, and unexpected consequences of nurses' experience practicing during the pandemic will have a disastrous impact on nurses, nursing, and the future of health care in the United States and globally. |
| 2 | Okunade et al., 2021, Routine Chest Radiograph in Pre-employment Medical Examination for Healthcare Workers: Time for a Review of the Protocol. | Nigeria | Document review | Routine CXR as part of examination for prospective employees is no longer necessary. It is suggested that routine use should be limited to older job seekers. |
| 3 | Schwartz et al., 2020, Protecting Healthcare Workers During the Coronavirus Disease 2019 (COVID-19) Outbreak: Lessons From Taiwan's Severe Acute Respiratory Syndrome Response | Taiwan | Report | The researchers suggest overworked and under-resourced HCWs facing the possibility of infection, and misleading information about a rapidly developing epidemic, may refuse or be unable to work. |
| 4 | Kong et al., 2017, Health Screening in Workplace | Malaysia | Quantitative, Cross-Sectional. | The researchers found a small number of NCD. The issue was only obesity and overweight. Active steps need to be taken. |
| 5 | Beglaryan & Shakhmuradyan, 2020, The impact of COVID-19 on small and medium-sized enterprises in Armenia: Evidence from a labor force survey | Armenia | Document review | The virus will impact the number of jobs; the quality of work; and effects on specific groups who are more vulnerable to the adverse labor market outcomes. |
| 6 | Sakr et al., 2021, Occupational Exposure to Blood-Borne Pathogens among Healthcare Workers in a Tertiary | Lebanon | Observational descriptive study | Half of the participants were [2]jured using either a syringe or a suture needle; and mostly during or after use. Occupation and incident location was |

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|---|---|
| Care Center in Lebanon | associated with Needle Stick Injuries. The mean BBP exposure incidence rate was 5.4 per 100 full-time employees, 65.6 per 100 bed-years, and 0.48 admission years. |

The above table is the summary of 6 documents which are the core of all the literatures extracted by PRISMA Analysis. The studies were conducted in 6 countries (USA, Nigeria, Taiwan, Malaysia, Armenia, and Lebanon). The six documents were published between the years of 2016 to 2021. The research methods are a combination of quantitative, document review, case study, opinion, observational and report. The 6 records conclude that during this Covid-19 there is an additional risk of virus infections among healthcare workers (Haas et al., 2020; Schwartz et al., 2020). The pandemic will impact the quantity and quality of jobs (Beglaryan & Shakhmuradyan, 2020). Routine healthcare screening needs to be reviewed, and health screening should be evidence-based examination (Kong et al., 2017; Okunade, 2018; Sakr et al., 2021). In short, the findings leave several questions that need to be answered. The problem is what types of health screening which can be conducted by OH nurses? Then what examinations are needed for nurses who want to work during the Covid-19 pandemic? Last but not least, what kind of health care examination and how the strategy flow which can be completed remotely for nurses who will work?

## Discussion

### Routine Pre-employment Health Screening by OHN

Since the spread of the novel Covid-19 pandemic, there has been a massive change in healthcare services (HHS Goverment, 2020). The most common one is the initial screening of every patient admitted to hospital (Keene et al., 2021). Every patient should be screened to declare if they have symptoms or are suspected of being infected with Covid-19. The changes of procedures in healthcare have a major impact on the duties and responsibilities of nurses (ICN, 2020a). The Covid-19 pandemic does not only affect the health service system but also all-new employee recruitment system (ILO, 2020). Covid-19 screening is an absolute requirement for every prospective employee to ensure that the person concerned is not infected (Schaafsma et al., 2016). Essentially the system has been running for a long time (Faught et al., 2017; Kong et al., 2017). Yet the types of health screening for healthcare workers are different from other professions (Ogundele, 2018; Sakr et al., 2021). Another difference is an occupational risk. From an occupational health perspective, health examination is divided into three risk groups, namely low risk, medium risk, and high risk (Preisser et al., 2016). Low risks are employees who work in offices or office-based activities (Estryn-Behar, 2001). Moderate risk is in operational work or field in industrial settings but does not require a major physical effort (Schaafsma et al., 2016). While high risk is the type of work that requires running, jumping, swimming, and climbing (Preisser et al., 2016).

Pre-employment screening conducted by OH Nurses consists of three parts (Rasmor & Brown, 2001). The first part is an administrative questionnaire containing information on name, address, place and date of birth, gender, and occupation. The other questionnaire contains medical history, occupational health history, family medical history, allergies, immunizations and the presence or absence of drugs currently consumed. The second part of the examination is a basic clinical examination which includes measurements of body weight and height, blood pressure, pulse, visual acuity, and urine analysis (dipstick urine test). If any abnormality is found in the initial examination, OHN will refer to a physician-based health assessment. If major health style risk is identified appropriate advice could be given. The third part of the examination is an additional examination which includes Eye testing: color vision, Hearing: audiometry, Laboratory tests: Blood tests, Urine Analysis, Radiological investigations: Chest-X Ray, Pulmonary function–spirometry or peak flow, Electrocardiogram (ECG), VO2 Max. Of these 7 types of examinations, two of them are carried out by other professions, namely laboratory examinations and chest X-Rays. The rest can be done by OHN.

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**Pre-employment Health Screening for Nurses**

There are 8 categories of FTW examination for pre-employment health screening: radiation workers, food handlers, firefighters, drivers, healthcare workers, divers, offshore workers, and technicians (OSHA, 2015). Each group has a specific health assessment. Nurses in this case are included in the category of health care workers (HCW) where the type of examination that is most needed is Blood Borne Pathogen (BBP) (Sakr et al., 2021). Nurses as HCWs are at increased risk of BBP due to their exposure to contaminated blood and body fluids. WHO estimates almost three million percutaneous exposures among HCWs occur every year in developing and transitional countries (Sakr et al., 2021). Therefore, the health examination of nurses related to infectious diseases such as hepatitis (HBV, HCV, and HIV) is very important and becomes the main requirement. That is what distinguishes pre-employment screening in nurses with other professions or workers. The HBsAg (hepatitis B surface antigen) test is a test performed as a way to detect hepatitis B (Ogundele, 2018). The HIV test is performed to detect HIV antibodies in the blood (Bradshaw et al., 2018). The PCR test is used to detect the genetic material (RNA or DNA) of HIV in the blood. In addition to the general examination as described in the previous section, special tests for BBP and HIV are prerequisites for pre-employment health screening. During this Covid-19 pandemic, the examination requirements were added to the Covid-19 Antigen or PCR examination.

**Remote Health Screening System for Nurses**

Government regulations in the health and labor sectors have changed for the last almost two years due to Covid-19 pandemic (Menteri Kesehatan RI, 2020). One of the rules is that social distancing policies are necessary to control and prevent the spread of the virus infection. Those regulations are applied from central until local governments and institutional levels. At the healthcare provider level, current emergency patient admission flowchart in each hospital for example, is implementing special triage for Covid-19 screening. Those who have symptoms or are suspected of being exposed receive special treatment by Covid-19 Antigen or PCR tests (Kemenkes, 2020). Those who are positive are separated and the negative ones will continue with the subsequent procedures. Based on the problem, organizations began to adopt a remote pre-employment health screening policy (Hunter et al., 2020). Health screening is to be completed by prospective workers in their nearest place of origin, without having to visit or come to the company's clinic or health centers to be challenged during pandemic. The problem is, not all institutions or companies enforce the regulations. As a result, it will increase the risk of Covid-19 exposure for the prospective workers. In addition, it will surge financial expenditure, time and energy because of the distance reason.

The suggestions are, first, organization should prepare a memorandum of understanding (MOU), between the company and healthcare centers or clinics in different towns of different provinces. It is recommended to have accredited health care providers so that the quality and facilities are maintained. Second, to set a standard of health screening, so that clinics or health centers can just fill in the forms without difficulties regarding the type of examination requested. Third, to create an electronic application. The downloadable application contains information on the type of examination, fitness status, and health advice for the prospective employees. Those suggestions are simple to implement by all healthcare organizations as long as they are equipped with network facilities, computers, and cell phones. The obstacle is that its implementation requires costs and manpower who manage the program under the auspices of the human resource department. However, the value of it will be enormous as it can be not only beneficial for job-searching nurses but also other employees in general

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**Diagram 2: Pre-employment Flow for Nurses**
*Source: Cochrane Library 2016, p.4.*

The diagram shows the flowchart of the pre-employment health screening process for nurses. The stage after health screening suggests if risks are detected the management can reject, employed but with risk, or employed but risk should be mitigated. Thus, during the Covid-19 pandemic prospective employees are at risk. Remote pre-employment health screening system help reduce the risk for the benefit of all.

## Conclusion

The current impact of novel Covid-19 pandemic on the pre-employment health screening system is the increase of standard operating procedures on the types of examinations. The procedures are meant to ensure the fitness status of prospective workers. From OH nursing perspective as healthcare professionals, such changes results in additional health examinations, besides initially, Blood Borne Pathogens, but now with Covid-19 Antigen and or PCR. The extra examination is another challenge for the recruitment system, especially if the candidates come from remote area and they find difficulties in using transportation. The study of document review tried to analyze and compared between the existing and remote pre-employment health screening systems and suggest a new flowchart as the solution during pandemic. The advantages of the study are besides providing a new flow it is also to take into consideration in the recruitment of nurses, and provide references for future research. The shortcomings are the study are lack of references related to nursing recruitment during the Covid-19 pandemic, and the absence of direct research on similar subject. However, the finding has offered assistance to the health screening flow during the Covid-19 pandemic.

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