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# Community Nursing Assessment of Family Health Management Among Factory Workers' Households in Rural Indonesia

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## ABSTRACT

**Background:** Background: Wiloso Hamlet, Gondowangi Village, Wagir Subdistrict, Malang Regency, is predominantly inhabited by informal laborer residents. Occupational health has become a key priority within Indonesia's primary health care transformation at the Puskesmas (Community Health Center). **Purpose**: The researcher would like to apply the nursing process to the community health problem in Wiloso Hamlet, Gondowangi Village, Wagir District, Malang Regency. **Methods:** This study employed a case study design using a Community Health Nursing Care approach to assess working groups residing in three neighborhoods (RT 20; RT 22, and RT 23) of RW 04. The instrument used was the Community Health Nursing Assessment Format, which measured demographic characteristics, family health conditions during the past six months, and health-related behaviors, including waste disposal, smoking habits, insurance ownership, and health service utilization. **Results:** Data were collected from 583 individuals representing 180 households, with 61.41% in the productive age group. Employment distribution showed that 138 individuals (23.67%) were private employees, 81 (13.89%) farmers, and 79 (13.55%) informal workers: laborers, domestic helpers, and construction workers. The most common diseases were acute respiratory infections (32%) and hypertension (26%). Two primary diagnoses were identified: Tendency toward Risky Health Behavior (D.0099) and Ineffective Health Maintenance (D.0003). The proposed interventions included Health Education (I.12383), Promotion of Healthy Behavior and Lifestyle (I.12472), education on the dangers of smoking and air pollution from waste burning, and screening for pulmonary tuberculosis (TB), chronic obstructive pulmonary disease (COPD), and cancer. **Conclusions:** Strengthening partnerships among Puskesmas, local government, and nearby industries is recommended to ensure the sustainability of occupational health initiatives.

## KEYWORDS

Community Nursing, Assessment, Family Health, Workers

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## 1. BACKGROUND

Wiloso Hamlet is one of four hamlets located in Gondowangi Village, which lies within Wagir Sub-district, Malang Regency. The village is situated in a hilly area at an altitude ranging from 480 to 512 meters

above sea level. It has an estimated population of approximately 3,828 residents, the majority of whom work as farmers and daily laborers in several large factories within Wagir Sub-district, Malang Regency. These include sugar factories, incense manufacturing, cigarette factories, mushroom cultivation, and various small- and medium-sized enterprises engaged in agricultural and livestock product processing, operated by the local community of Wagir (Gondowangi Village Profile, 2020).

Laborers, employees, or workers are defined as individuals who work permanently for another person or an institution/office/company and receive wages or salaries, either in cash or in kind, from the same employer within the past month (BPS, 2025). From a socio-health perspective, employment patterns dominated by farming and daily labor significantly influence household health burdens. This includes an increased prevalence of work-related diseases, limited time for preventive health check-ups, and a growing need for accessible promotive and preventive health programs such as integrated health posts (Posyandu), environmental health education, and screening for communicable and non-communicable diseases within residential areas.

The International Labor Organization reports that the global informal workforce continues to increase, with an estimated total of nearly 2 billion workers (ILO, 2024). Of the global labor force, approximately 58% are engaged in informal employment, including unregistered workers, self-employed individuals, and daily laborers, amounting to around 2 billion people worldwide (WIEGO, 2025). In Indonesia, the total number of employed individuals in 2024 reached approximately 144.64 million, of which around 19.34 million were employed in the industrial sector (Santika, 2024). In 2023, a total of 7,380 residents were recorded as residing permanently in Gondowangi Village (BPS Malang Regency, 2024). However, the health status of the working community at the neighborhood (RT) level in Dusun Wiloso, Gondowangi Village, Wagir Sub-district, Malang Regency, has not yet been clearly identified.

Environmental health and occupational health are among the primary focuses of the primary healthcare transformation led by community health centers (Puskesmas), which emphasize a comprehensive, continuous, and life-cycle-based approach (Minister of Health

Indonesia, 2023; Zakia, 2024). The Strategic Plan of the Indonesian Ministry of Health for 2020–2024 also prioritizes improving access to occupational health services for informal-sector workers and vulnerable groups, with Puskesmas serving as frontline providers. Specifically, Dusun Wiloso in Gondowangi Village, Wagir Sub-district, is a priority area for enhancing occupational health among informal agricultural workers and daily laborers through various community-based nursing approaches, while also functioning as a designated service area under the supervision of Wagir Health Center (Puskesmas Wagir) at the sub-district level.

This Community Nursing case study was conducted with the objectives of conducting a community health nursing assessment of permanent residents who are predominantly workers, assessing environmental health conditions at the neighborhood level, and detecting occupational diseases early.

## 2. METHODS

### Design

This study employed a descriptive–analytical design using a cross-sectional case study approach. This approach was applied to obtain a comprehensive overview of the social, economic, environmental, and health conditions of communities residing in RT 20, RT 22, and RT 23 of Dusun Wiloso, Gondowangi Village, Wagir Sub-district. The study focused on community health nursing assessment and the planning of interventions based on community nursing principles.

### Sample and setting

The sample for this case study consisted of community members residing in the three selected neighborhood units. In RT 20, Dusun Wiloso, assessments were conducted among 80 households, with an estimated total population of 384 individuals, representing a response rate of 63% of the 100 households recorded at the RW level. In RT 22, assessments reached 67 households, totaling 106 individuals, achieving a 100% response rate. Meanwhile, approximately 33 households, totaling 199 individuals, in RT 23 were also assessed. Overall, community nursing assessments were conducted for 583 residents across the three neighborhood units. The assessments were not limited to working-age populations but included individuals across all age groups, ranging from infants to older adults, with diverse educational backgrounds and occupations. The activities were conducted from May to June 2025.

**Variable**

Demographic characteristics, diseases experienced by family members in the previous 6 months, and physical environmental conditions, such as waste disposal practices, household drainage systems, and general family health-related behaviors, were assessed in this study.

**Instruments**

The primary instrument used in this study was the 2014 version of the Family Community Nursing Assessment Format developed by IPKKI, based on SDKI (Indonesian Nursing Diagnosis Standards), SLKI (Indonesian Nursing Outcomes Standards), and SIKI (Indonesian Nursing Intervention Standards). Data collection was supported by observation sheets for housing and environmental conditions, basic health assessment tools such as sphygmomanometers, thermometers, and weighing scales, and data tabulation forms for analysis and problem formulation.

**Data collection**

Data collection was conducted using several methods: (1) direct interviews with heads of households and family members regarding health conditions, disease history, lifestyle habits, and access to health facilities; (2) direct observation of the physical condition of houses and the surrounding environment, including sanitation, water sources, bathing–washing–toilet (MCK) facilities, and environmental cleanliness; (3) simple physical examinations (e.g., blood pressure and body temperature measurements) for family members presenting health complaints; and (4) documentation review, involving systematic recording of data using the community nursing assessment format.

**Data analysis**

The collected data were analyzed descriptively and subsequently categorized according to social, economic, environmental, and health dimensions. Relevant data were processed into distribution tables. Further analysis was conducted using the SDKI framework to identify priority nursing problems, followed by the formulation of interventions based on SLKI and SIKI standards.

**Ethical consideration**

This activity was conducted in strict adherence to nursing ethical principles, including: (1) informed consent, whereby students obtained permission from heads of households and explained the purpose and objectives of the assessment prior to data

collection; (2) confidentiality, ensuring that all collected data were kept confidential and used solely for educational purposes; (3) respect for persons, whereby community members were given the freedom to participate voluntarily without coercion; and (4) justice, ensuring that all family members were provided equal opportunities to receive services during the community nursing activities.

## 3. RESULTS

The following section presents the comprehensive results of the assessment conducted across the three neighborhood units (RT), covering demographic characteristics, health status over the past six months, physical environmental conditions including access to clean water sources and general family health-related behaviors.

**Table 1.** Demographic characteristics

| Demographic Data | Frequency (f) | Percentage (%) |
|---|---|---|
| Gender | | |
| Female | 281 | 52.0 |
| Male | 302 | 48.0 |
| Age (years) | | |
| 0 - <5 | 42 | 7.20 |
| 5 - <13 | 55 | 9.43 |
| 13 - <18 | 64 | 10.98 |
| 18 -<45 | 253 | 43.40 |
| 45 - <60 | 105 | 18.01 |
| 60 - <90 | 63 | 10.81 |
| >90 | 1 | 0.17 |
| Occupation | | |
| Civil servants/Military/Cops | 5 | 0.86 |
| Private sectors | 138 | 23.67 |
| Entrepreneur | 40 | 6.86 |
| Farmers | 81 | 13.89 |
| Laborer | 13 | 2.23 |
| Unemployed (housewives, etc) | 227 | 38.94 |
| Other informal sector | 79 | 13.55 |
| Income (per household in Rupiah) | | |
| <1 million | 54 | 30 |
| 1 - <3 million | 81 | 46 |
| >3 million | 44 | 24 |

Table 1 summarizes data from 583 individuals across 180 assessed households. Of the total population, 302 individuals (48%) were male, and 281 individuals (52%) were female. The proportion of residents within the productive age group (18 to <60 years) accounted for 61.41% of the population. In terms of employment status, 138 individuals

(23.67%) were employed as private-sector employees, 81 individuals (13.89%) worked as farmers, 227 individuals (38.94%) were not employed, and 79 individuals (13.55%) were categorized under other occupations, primarily informal sector workers such as construction laborers, domestic assistants, and masons.

**Table 2.** Characteristics, Morbidity, Health Behavior, and Utilization of Health Services

| Demographic Data | Frequency (f) | Percentage (%) |
|---|---|---|
| Morbidity during past 6 months (per family member) | | |
| ARI/RTI | 23 | 32 |
| TBC | 2 | 3 |
| Dengue fever | 9 | 13 |
| Hypertension, Cardiac problem | 19 | 26 |
| Other | 19 | 26 |
| Total | 72 | 100 |
| Health Behavior (per household) | | |
| Family waste management | | |
| Piled | 23 | 13 |
| Open burning | 39 | 22 |
| Collected at final waste disposal site | 118 | 66 |
| Health insurance | | |
| BPJS | 91 | 51 |
| Private | 72 | 40 |
| Uncovered | 17 | 9 |
| Smoking inside the house | | |
| Yes | 87 | 48 |
| No | 93 | 52 |
| Daily workout **activities** | | |
| Yes | 28 | 16 |
| No | 152 | 84 |
| Utilization of health service **facilities** | | |
| Hospital | 35 | 19 |
| Primary health center | 113 | 63 |
| Complementary/alternative | 26 | 3 |
| Used more than 1 facilities | 24 | 14 |

*ARI: Acute Respiratory Infection; RTI: Respiratory Tract Infection; TBC: Tuberculosis Pulmonary*

Table 2 presents data on diseases experienced by family members during the past six months. The highest prevalence was observed for communicable diseases, particularly acute respiratory infections (ARI), affecting 23 individuals (32%), followed by dengue hemorrhagic fever (DHF), reported in 9 individuals (13%). Regarding non-communicable diseases, hypertension was reported in 19 individuals (26%), while other non-communicable conditions were also reported in 19 individuals (26%). Overall, 72 residents (12%) reported illness in the past six months. Regarding health-related behaviors, 118 households (66%) managed household

waste through regular collection and disposal at designated landfill sites. However, 23 households (13%) continued to dump waste, and 29 households (22%) burned household waste. It was also identified that 17 households (9%) had no form of health insurance or coverage. Furthermore, 87 households (48%) had at least one family member who smoked inside the house, and 152 households (84%) reported not engaging in regular daily physical exercise. Based on the findings of this assessment, further analysis was conducted to identify and formulate the following community nursing problems.

**Table 3.** Data analysis and community health nursing problem diagnoses

| No | Nursing problem & Supportive data | Etiology |
|---|---|---|
| 1 | Nursing problem:<br>- Tendency toward Risky Health Behavior (D.0099)<br>Subjective data:<br>- The majority of residents in RT 20 reported that they were rarely engaged in physical exercise<br>- Most residents in RT 22 and RT 23 reported continuing to consume high-salt diets and having insufficient levels of physical activity.<br>- The majority of residents were employed as cigarette factory workers, farmers, or informal sector workers such as construction laborers, domestic helpers, and daily wage workers.<br>Objective data:<br>- The incidence of acute respiratory infections (ARI) was reported in 23 individuals (32%).<br>- The occurrence of hypertension and heart disorders was identified in 19 individuals (26%).<br>- Indoor smoking behavior was reported in 87 households (48%). | Choosing unhealthy life style |
| 2 | Nursing problem:<br>- Ineffective health maintenance (D.0003)<br>Subjective data<br>- The majority of residents in RT 20 reported that they rarely engage in physical exercise.<br>- Most residents in RT 22 and RT 23 reported continued consumption of high-salt foods and insufficient levels of physical activity.<br>Objective data<br>- A total of 39 households (22%) reported the practice of burning household waste.<br>- As many as 152 households (84%) did not engage in daily physical exercise.<br>- Seventeen households (9%) did not have any form of health insurance or health coverage.<br>- Nineteen individuals (26%) were identified as having hypertension, while 9 individuals (13%) experienced dengue hemorrhagic fever (DHF). | Choosing unhealthy lifestyle |

Two community nursing problems were identified among residents of RT 20, RT 22, and RT 23, RW 04, Wiloso Hamlet, Gondowangi Village, Wagir district, Malang Regency. These problems were: (1) Risk-Prone Health Behavior related to the adoption of unhealthy lifestyle choices, and

(2) Ineffective Health Maintenance related to unhealthy lifestyle selection.

Based on the identification of these nursing problems, several intervention programs were developed as recommended promotion and preventive efforts. These interventions were designed in accordance with community nursing intervention strategies and are feasible for implementation at the neighborhood (RT) level, through collaborative efforts involving village authorities, workplaces or companies where residents are employed, and the local community health center (Puskesmas).

**Table 3.** Intervention and health program recommendation

| No | Nursing Intervention | Program Recommendation |
|---|---|---|
| 1. | Nursing diagnoses:<br>- Tendency toward risky health behavior related with choosing unhealthy lifestyle (D.0099)<br><br>Nursing intervention:<br>- Health Education (I.12383)<br><br>Nursing outcome targets:<br>- Following the implementation of nursing interventions over a period of 1 × 30 days, an improvement in Health Maintenance (L.12106) is expected, as indicated by:<br>  - Enhanced adaptive behavior<br>  - Improved understanding of healthy behaviors | Health education on hypertension prevention and the promotion of a healthy lifestyle<br><br>Target population:<br>- Individuals within the productive age (18 - <60 tahun)<br><br>Health promotion/education media:<br>- Lectures and interactive question-and-answer sessions supported by leaflets, posters, and video materials<br><br>Expected outcome:<br>- Increased knowledge and improvement in health-related behaviors that pose risks to health |
| 2. | Nursing diagnoses:<br>- Ineffective health maintenance related with unhealthy lifestyle choices (D.0003)<br><br>Nursing intervention:<br>- Promotion of health-seeking behaviors (I.12472)<br><br>Nursing Outcome Targets:<br>- Following the implementation of nursing interventions over a period of 1 x 30 days, Health Behavior (L.12107) is expected to improve, as indicated by:<br>  - Acceptance of changes in health status<br>  - Ability to perform preventive actions against health problems<br>  - Ability to enhance and maintain health | Health education on the hazards of smoking and air pollution from waste burning; Screening for Pulmonary Tuberculosis, Chronic Obstructive Pulmonary Disease (COPD) and Cancer<br><br>Target population:<br>- Working-age adults (18 - <60 tahun) who are employed<br><br>Health promotion media:<br>- Lectures and interactive question-and-answer sessions supported by leaflets, posters and video materials; collaboration through cluster 3 partnerships<br><br>Expected outcomes:<br>- Increased knowledge and improvement in health-risk behaviors, as well as an increased proportion of individuals aged 18 to <60 years who undergo anamnesis-based screening for pulmonary tuberculosis and COPD |

## 4. DISCUSSION

A total of 180 households comprising 583 individuals were assessed, with laborers, private-sector employees, and informal workers representing the dominant characteristics of the community in this area. Workers in the private sector, including both formal and informal employment, face a range of specific health risks related to working conditions, occupational environments, and socioeconomic status. Over the past five years, both global and local studies have consistently shown that this group bears a substantial burden of preventable and manageable diseases, which could be more effectively addressed through community health and community nursing approaches.

Several factors explain why working communities require special attention and the implementation of primary prevention and health promotion strategies. These include exposure to occupational environmental hazards such as high physical workload, chemical substances, dust, and poor air quality; economic welfare factors affecting workplace safety; mental and social health problems; and limited access to occupational safety and health services.

Data indicate that the majority of residents work as farmers and daily laborers in several large industries located within Wagir Sub-district, Malang Regency, including sugar factories, incense factories, cigarette factories, and various small- and medium-scale agricultural processing enterprises. Workers involved in the cigarette industry, whether as tobacco leaf rollers, packers, or dryers, face particularly high health risks. Exposure to nicotine and tobacco-related chemicals may occur through both dermal absorption and inhalation. This condition, known as Green Tobacco Sickness (GTS), is a form of acute nicotine poisoning characterized by nausea, vomiting, dizziness, and hypotension (Rizki et al., 2021). Kumar et al. (2023) reported that nicotine absorption levels among cigarette factory workers can be 30–40% higher than those of the general population, even without active smoking. Moreover, prolonged exposure to secondhand smoke in production areas increases the risk of chronic obstructive pulmonary disease (COPD), chronic bronchitis, and lung cancer (Mochizuki et al., 2024).

The sugar industry involves sugarcane milling, bagasse combustion, and high-temperature processing, which expose workers to organic dust, combustion smoke, and excessive noise (Waheed et al., 2022). A study conducted in East Java by Purwandari

(2023) reported a high prevalence of acute respiratory infections (20–30%), eye irritation, and skin diseases among sugar factory workers due to dust exposure and heat vapors. Similarly, a case study in Central Aceh by Putra et al. (2024) indicated that long-term exposure to bagasse can lead to pulmonary diseases caused by Thermoactinomyces sacchari. This fungus grows in moist sugarcane residue. This exposure results in symptoms such as chronic cough, dyspnea, and low-grade fever, which are often misdiagnosed as mild infections but actually represent occupational hypersensitivity pneumonitis (Huntley et al., 2023). In addition, high temperatures in production areas and night shift work contribute to dehydration, electrolyte imbalance, and extreme fatigue. The International Labor Organization / ILO (2024), has emphasized that industrial workers are among the groups most vulnerable to heat-related illnesses, particularly in tropical countries such as Indonesia (Wolff et al., 2021).

Likewise, the incense manufacturing industry, often perceived as low-risk, poses significant long-term health hazards. Incense combustion produces fine particulate matter (PM2.5), including benzene, formaldehyde, and polycyclic aromatic hydrocarbons (PAHs), all of which are classified as Group A carcinogens (Riaz et al., 2023). Workers involved in powder mixing, grinding, and drying inhale fine particles and volatile compounds that may cause respiratory irritation, allergic reactions, and impaired lung function. A study by Lee et al. (2021) in Taiwan found that incense workers had lung capacity levels 15% lower than those of the control population, along with elevated pulmonary inflammatory biomarkers. In addition to respiratory effects, chronic exposure to benzene and formaldehyde increases the risk of hematological disorders, such as aplastic anemia and leukemia (Mahdalena et al., 2024; Sitoresmi, 2022). Poor ventilation and confined workspaces common conditions in home-based industries further exacerbate the risk of respiratory diseases and cancer (Akbar & Setiani, 2024). However, the exact number of workers with diagnosed occupational diseases could not be identified in this study.

Data analysis revealed two major community nursing problems: (1) Tendency toward risky health behavior and (2) Ineffective Health Maintenance, both of which require interventions aligned with community nursing strategies. These include continuous health education and the

implementation of screening programs for pulmonary tuberculosis, COPD, and cancer, particularly among workers in cigarette, sugar, and incense factories, as well as among active smokers within households. Prolonged household waste burning also poses significant health hazards and requires targeted preventive action.

Economic welfare and workplace safety are also critical considerations for improving workers' health. A total of 81 households (46%) in Wiloso hamlet, Gondowangi Village, Wagir District, were identified as living on limited incomes, earning approximately IDR 1–3 million per month. Low income adversely affects families' purchasing power for nutritious and high-quality food, including fruits and vegetables, as well as their utilization of healthcare services. This is further compounded by the finding that 26 households (3%) relied solely on alternative healthcare services when family members became ill (Leba & Putri, 2021).

Mental and social health factors also warrant attention. Smoking behavior is significantly associated with stress and hypertension among private-sector workers, where smoking is often used as a coping mechanism or recreational activity (Basruddin et al., 2021). Assessment data revealed that 19 individuals (26%) experienced hypertension and heart-related disorders. Therefore, healthy recreational activities should be promoted and redirected toward positive behaviors such as group exercise programs targeting pre-elderly and elderly populations (Kim et al., 2022). Additionally, activities that enhance social interaction such as community clean-up campaigns (gotong royong) should be encouraged to improve environmental hygiene and prevent mosquito breeding, particularly given that 9 individuals (13%) experienced dengue hemorrhagic fever within the past six months (Kandi et al., 2024). Innovative and sustainable educational approaches, such as placing "no smoking" stickers inside homes and establishing smoke-free policies in social spaces, workplaces, and places of worship, could also be implemented in Wiloso, Gondowangi Village (Rahim et al., 2024).

Finally, limited access to occupational safety and health services must be addressed. The authors argue that nutrition improvement programs for workers are essential to enhance immunity and prevent disease. This aligns with the literature review by Rachmah et al. (2022), which demonstrated that nutritional interventions not only improve knowledge but also

positively influence body mass index (BMI) and blood nutritional biomarkers. In addition, adequate provision of personal protective equipment (PPE) and access to occupational health insurance should be strengthened through cross-sector collaboration among community health centers (Puskesmas), the Department of Manpower, and employers, to ensure the implementation of occupational health and safety measures based on a community nursing approach.

## 5. CONCLUSION

This study underscores the critical need for targeted occupational and community health interventions in the Gondowangi Village community in Malang Regency. A comprehensive community occupational nursing assessment identified two priority nursing diagnoses: risk-prone health behavior and ineffective health maintenance. Addressing these challenges necessitates a multisectoral approach. Strategic partnerships involving primary healthcare centers (Puskesmas), local government authorities, and occupational sectors are essential to deliver sustained health education and foster evidence-based, health-promoting behaviors.

For future directions, research should prioritize in-depth occupational health assessments and the implementation of targeted screening programs for work-related diseases. Additionally, longitudinal community nursing interventions are highly recommended to disrupt the long-term transmission cycles of both communicable and non-communicable diseases in the Wagir Sub-district, thereby advancing sustainable community and occupational health outcomes.

## DECLARATION OF INTEREST

The author declares no conflict of interest.

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## DATA AVAILABILITY

The data generated and analyzed during this study are not publicly available due to ethical considerations and the protection of participants' confidentiality but are available from the corresponding author upon reasonable request.

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