

Roles of agro-nursing in bringing health services in rural and remote areas of Indonesia

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Abstract

Agro-nursing is an innovative approach to health care that integrates nursing science with a contextual understanding of agricultural conditions and rural life. Rural and remote areas in Indonesia often face challenges in accessing adequate health care. This article discusses the role of agro-nursing in addressing these challenges, highlighting how nurses can act as agents of change who provide health care and empower communities through approaches appropriate to local characteristics. By utilizing local potential, community culture, and agricultural systems as an integral part of rural life, agro-nursing strengthens health care promotive, preventive, curative, and rehabilitative efforts. This study also highlights the importance of specialized training, cross-sector collaboration, and policy support to optimize the role of agro-nursing in improving the health of communities in remote and disadvantaged areas. It is hoped that agro-nursing can be a sustainable strategy for narrowing the gap in health services between urban and rural areas in Indonesia.

Keywords: agro-nursing, health services, rural areas, remote areas, community nursing

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Challenges of healthcare services in rural – remote areas in Indonesia

Nursing services in rural and remote areas face various challenges, including limited health infrastructure, lack of medical personnel, and limited access to healthcare facilities. Healthcare facilities are entities that deal directly with the community. Community health centers are still the primary healthcare facility that provides basic health services and referrals. In 2023, the number of community health centers in Indonesia is 10,180, consisting of 4,210 with inpatient facilities and 5,970 without inpatient facilities. The ratio of community health centers to sub-districts in 2023 is 1.4, indicating at least one community health center in each sub-district in Indonesia ([Ministry of Health of Indonesia, 2023](#)).

Rural and remote are concepts used to identify areas based on their level of accessibility, population density, and infrastructure. While both share similarities in terms of resource constraints, there are fundamental differences that influence approaches to health care. Rural refers to rural areas with relatively small populations, limited access to health facilities, and reliance on agriculture or local natural resources ([Christie et al., 2022](#)). Rural areas usually have connections to small towns or service centers, although access often takes time and effort. Key challenges in rural areas include limited health workers, minimal medical facilities, and social stigma related to health problems, including mental health.

Meanwhile, remote refers to isolated areas with a higher level of isolation than rural areas ([Watters et al., 2025](#)). These areas include mountains, small islands, or remote forests that are difficult to reach both physically and digitally. Access to health services in remote areas often relies on long-distance referral systems or telemedicine technology due to transportation and communication limitations. Geographic factors, extreme weather, and lack of infrastructure further complicate the provision of health services in



Figure 1. Conceptualized Framework of Agronursing

these areas.

Rural areas generally have low populations, limited infrastructure, and are far from urban centers (Asghari et al., 2024). Meanwhile, remote areas refer to isolated areas with limited access to basic health services. They are often difficult to reach due to geographic factors such as mountains, forests, or isolated islands (Franco et al., 2021). Both of these areas have unique challenges that affect how health services are delivered. In rural areas, people generally rely on local resources and have limited access to information, technology, and health services (Christie et al., 2022). Infrastructure such as roads, communications, and electricity may be inadequate, slowing the response in an emergency. These conditions make health services more difficult to reach and require health workers to be more creative in providing nursing care.

Meanwhile, remote areas are often more extreme than rural areas due to their profound isolation (Buse et al., 2022). These areas may not have health facilities, so health workers must travel long distances or use telemedicine to provide medical consultations. Challenging geographic conditions also delay the medical evacuation process in an emergency (Rossiter et al., 2023).

In the context of health, the concepts of rural and remote influence how services are designed and implemented. In rural areas, health services are often community-based, with nurses and health workers actively providing health promotion and early intervention (Hayes et al., 2025). Meanwhile, in remote areas, innovative approaches such as using health information technology (e-health) and telemedicine are crucial to bridging the gap in access to services (Tsou et al., 2021). The remote-rural concept can be understood through five rurality dimensions: geography, demography, economy, infrastructure, and socio-culture (Christie et al., 2022). This approach helps provide a more transparent framework for policymakers to improve access and quality of services, including health

services, in remote areas. Rural areas usually depend highly on the agricultural sector and local natural resources (Rossiter et al., 2023).

Meanwhile, remote refers to remote areas that are geographically difficult to reach, such as mountains, islands, or forest areas. Therefore, agricultural health nursing services are very much needed for people living in rural and remote areas. Nurses are needed in rural and remote health service environments because they carry out various roles that are very important for the health and well-being of these communities.

Health problems experienced by farmers are malnutrition (28.5%), anemia (62.6%), and joint and bone pain (50.3%) (Susanto et al., 2017). Health problems in farmers are caused by age factors, drinking habits, breaks in work less than 30 minutes while working, and workloads exceeding five working hours per week (Aji et al., 2023; Susanto et al., 2017, 2023; Susanto & Widayati, 2018). The unhealthy lifestyle of farmers is the primary trigger for health problems such as hypertension (Rhosani et al., 2023; Susanto et al., 2020; Susanto et al., 2022; Yunanto et al., 2023). Agricultural health nursing (in this case, called agro-nursing in Indonesia) can be a form of nursing service in agricultural areas to prevent and improve health levels through a community nursing care approach and family nursing care in rural and remote areas.

Nurses' role in providing care in rural – remote areas

Nurses play a critical role in providing health services in rural and remote areas as they are often the sole primary healthcare providers in rural and remote areas (Jennings et al., 2021; Muirhead & Birks, 2020), providing a range of services, including emergency care, chronic disease management, and mental health support (Kgatla et al., 2021). In addition, due to shortages of physicians and specialists, nurses in rural and remote areas often work in advanced

generalist roles, performing tasks that would typically be performed by medical practitioners (Muirhead & Birks, 2020), such as providing critical care, palliative care and managing cardiovascular disease (Holland et al., 2024; Kgatla et al., 2021). To provide effective services, nurses in rural and remote areas must engage directly and deeply with communities, building trust and understanding of cultural, historical, and family contexts (Malley et al., 2024). The number of health human resources in health facilities in Indonesia in 2023 is 2,077,473, consisting of 183,694 medical personnel (8.8%), 1,317,589 health workers (63.4%), and 576,190 health support personnel (27.7%). In 2023, there were 11.5% of health centers with a shortage of doctors, 59.1% of health centers with an excess of doctors, and 29.4% of health centers with a status of having enough doctors (Ministry of Health of Indonesia, 2023).

Agro-nursing development and implementation

Health services in rural and remote areas face various challenges, especially for agrarian communities that rely on the agricultural and livestock sectors as their primary source of livelihood. One innovative approach in nursing that aims to improve access and quality of health services in these areas is Agro-nursing, which integrates nursing science with an understanding of specific health challenges in the agricultural and livestock sectors (McCallum et al., 2023). Agronursing aims to provide health services that are more relevant to the working environment of farmers and ranchers and to increase awareness of occupational health in agrarian communities.

In the Indonesian context, the implementation of agro-nursing still faces structural challenges, including the lack of nursing staff with specific expertise in agro-nursing, limited policies that support the integration of health and agriculture, and the lack of incentives for medical personnel working in rural areas (Anggraini, 2023). The Ministry of Agriculture (2023) shows that only 5% of health workers in rural areas have special training related to farmer occupational health, so many cases of work-related diseases are not properly handled yet. Based on these challenges, the agro-nursing approach is becoming increasingly relevant as a solution to improving the quality of health services for agrarian communities. By strengthening agro-nursing education, developing more supportive policies, and integrating health technology into rural services and remote health nursing, health services in agrarian areas are hoped to be more optimal and sustainable.

Agronursing is developed based on the application of community nursing and public health with an emphasis on occupational health nursing, so that it becomes a service, namely agricultural health nursing (AHN). AHN, in the context of nursing services in agricultural and plantation areas in Indonesia, was created cognizant of agro-nursing

services. Agro-nursing is a nursing care service for the farmer population with various health problems. Furthermore, agro-nursing is a method of nursing care and nursing service management focusing on clients, individuals, families, groups, and communities. Agronursing services are provided in the form of holistic nursing care services, covering aspects of biological, psychological, social, spiritual, cultural, and developmental services.

Additionally, agro-nursing services in nursing care are provided comprehensively, which include promotive, preventive, curative, and rehabilitative services. Agronursing services are provided in the agricultural scope, which includes agriculture, plantations, fisheries, animal husbandry, and agro-industry (Susanto, 2022; Susanto et al., 2022). Therefore, agro-nursing is a form of nursing care management and nursing service management for both healthy and sick clients that is holistic and comprehensive throughout the human life cycle in the agricultural context.

As a field of nursing services, agro-nursing is developed based on a study of four components of the nursing paradigm, namely humans, health, nursing, and the environment. The first agro-nursing paradigm pattern is related to humans. Humans in the context of agro-nursing services are viewed as clients who will receive nursing care in the fields of agriculture and plantations. Humans are described as a complete and complex individual system, which includes humans as biological, psychological, social, spiritual, and developmental beings (Susanto, 2022; Susanto et al., 2022). In providing agro-nursing services to humans, ethical and cultural aspects that are unique and universal in the agricultural scope are considered.

The second nursing paradigm in agro-nursing is related to nursing. The view of agro-nursing related to nursing is recognized as a form of service that is part of health services that can be provided to improve health status and improve health levels in agricultural and plantation community groups (Susanto, 2022; Susanto et al., 2022). Therefore, nursing in the context of agro-nursing is seen as an effort to provide health services, both promotive, preventive, curative, and rehabilitative, to clients, both as individuals, families, groups, and communities, throughout the human life cycle in the agricultural scope. Meanwhile, the environment, as the third component in agro-nursing, is all things, both physical and non-physical environments around human life, that can affect health and illness in agricultural and plantation areas. Furthermore, the environment in the context of agro-nursing is seen as all aspects that can affect basic human needs both internally and externally in the agricultural scope (agriculture, fisheries, livestock, and agro-industry) (Susanto, 2022; Susanto et al., 2022). Furthermore, the agro-nursing view regarding the fourth paradigm component related to health is the optimal state of an individual physically, socially, psychologically, and spiritually. In addition, health

also indicates a state where an individual is free from dependency and disability. Therefore, health in the context of agro-nursing is defined as the state of an individual's system in the range of healthy or sick in the agricultural scope.

As a form of health and nursing services, agro-nursing is based on nursing theories. Agro-nursing theory is based on three nursing theories and models, namely Neuman's System Model, Pender Model, and Leininger's Sunrise Model (Transcultural Approach) (Susanto et al., 2024), which are developed into a model with a unique essence, namely the provision of nursing services in agricultural areas. Figure 1 below illustrates the visualization of the agro-nursing model theory. Based on Figure 1, there are three factors that are closely related to improving health holistically in agricultural areas, namely (1) Intrapersonal factors, such as demographics, health history, gender, motivation, coping mechanisms, and education; (2) Interpersonal factors, such as appropriate norms between family or partners and health workers, health support between family or partners and health workers, and role models, namely health workers with family or partners; and (3) Extra-personal factors, such as culture, social, politics, technology, religion, values, health service systems, health policies. These related factors are health indicators that need to be improved with the Neuman System Model, consisting of flexible, normal, and resistant lines of defense. Accordingly, in agricultural areas, farmers are the core of the community, family, or individuals who are vulnerable or at risk of contracting infectious or non-infectious diseases.

Furthermore, Figure 1 describes the perception of the farming community in implementing actions that improve health and also the obstacles that can occur from various health problems that are threats or challenges that can trigger the farming community in making decisions to take action to improve the form of prevention in accordance with the Pender Model on health promotion related to primary, secondary and tertiary prevention in collaboration and assisted by health workers, especially nurses. The role of nurses is as educators in providing health education to the community in the agricultural environment, both communities, families, and individuals, with a transcultural approach adapted from Leininger's Sunrise Model. Through a transcultural approach, nurses can facilitate and support farming communities in improving and maintaining health, including facilitating and supporting farming communities in making and taking mutual health-related decisions. Additionally, it may help farmer communities to reshape their healthier behaviors while maintaining their local cultural values and beliefs. After participating in the collaborative health programs, the farmer communities' self-efficacy may improve and potentially succeed and retain the future developed programs. Community health behavior improvement will enhance the community's health status in six aspects: biological, psychological,

social, cultural, developmental, and spiritual.

In practice, agro-nursing adapts nursing methods to the specific challenges faced by agricultural workers and rural communities. Farmers and agricultural workers are at high risk of experiencing various health problems, such as exposure to pesticides, work injuries due to the use of heavy equipment, zoonotic diseases from livestock, and respiratory disorders due to inhalation of dust particles and agricultural chemicals (Byrne et al., 2024). Therefore, the agro-nursing health approach focuses on curative aspects and is preventive and promotive by educating the community about occupational health and safety. Agro-nursing has a different approach than the conventional nursing model. If urban nursing focuses more on treating acute diseases and specialist services, agro-nursing emphasizes community-based health services, health education, and disease prevention relevant to agriculture (McCallum et al., 2023). Finally, it can be concluded that agro-nursing has a strategic role in improving health services for agricultural communities in rural and remote areas. Integrating nursing science with an understanding of the agricultural sector allows for a more contextual approach to addressing the various health challenges that farmers and agricultural workers face. In its application, agro-nursing not only emphasizes the curative aspect but also prioritizes promotive and preventive efforts, such as occupational health education, early detection of occupational diseases, and the use of telehealth technology to expand access to medical services. With the increasing complexity of health problems in the agricultural environment, agro-nursing has become a relevant solution in addressing the health needs of rural communities, which often experience limited medical resources and health infrastructure.

Implementing agro-nursing in rural and remote areas faces various challenges, ranging from limited medical personnel and geographical constraints to minimal awareness of occupational health in agricultural communities. However, various strategies have been developed to overcome these obstacles, including implementing mobile agro-nursing clinics, telemedicine, and community empowerment to improve the quality of health services, reduce the number of occupational diseases, and encourage active community involvement in maintaining their health. Therefore, the agro-nursing approach is becoming increasingly relevant in strengthening health systems in rural and remote areas.

Furthermore, the sustainability of agro-nursing in supporting rural and remote health requires support from various parties, including the government, academics, and health workers. Regulations that support incentives for rural health workers, investment in health infrastructure, and integration of telehealth into the national service system are crucial steps to ensure the effectiveness and efficiency of agro-nursing in the long term. With

the right strategy and community-based approach, agro-nursing can continue to grow as an integral part of health services in rural and remote areas in Indonesia and may be applicable in other countries with vast agricultural communities, ensuring that agrarian communities have access to quality and sustainable health care.

Conclusion

Finally, it can be concluded that agro-nursing has a strategic role in improving health services for agricultural communities in rural and remote areas. Integrating nursing science with an understanding of the agricultural sector, including technology integration, allows for a more contextual approach to addressing the various health challenges that farmers and agricultural workers face. In its application, agro-nursing emphasizes the curative aspect and prioritizes promotive and preventive efforts, such as occupational health education, early detection of occupational diseases, and the use of telehealth technology to expand access to medical services. Thus, agro-nursing is one of the relevant and potential solutions to manage the health needs of rural communities that are increasingly challenging and often experience medical resources and health infrastructure shortages.

Declaration of Interest

None to declare

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Data Availability

None

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