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WOMEN EMPOWERMENT PROGRAM AND WOMEN'S HEALTH: A PAPUA AND EASTERN INDONESIA CASE STUDY

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ABSTRACT

The research examines the role of the PKK program in promoting women's health. This research uses a quantitative approach, analyzing secondary cross-sectional data from the Indonesian Family Life Survey (IFLS) East, 2012 using the Probit model. The research seeks to address existing gaps in the literature related to the role of women empowerment programs in enhancing health outcomes in underserved and underdeveloped areas of Indonesia. As a result, the findings reveal that the family group program (dasawisma) involving ten to twenty households has a significant and positive effect on women's health. Participants in this program show a higher probability of being in good health compared to non-participants. On the contrary, participation in the medicinal herb garden and health fund programs does not have a significant effect on improving women's health in Papua and eastern regions. Furthermore, higher education levels and urban residency positively influenced women's health, whereas age and distance to health facilities negatively affected health status.

Keywords: *Women Empowerment Program (PKK), Women's Health, Papua, Eastern Regions*

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ABSTRAK

Penelitian ini menganalisis peran program pemberdayaan kesejahteraan keluarga (PKK) dalam peningkatan kesehatan perempuan di Papua dengan pendekatan kuantitatif. Data yang digunakan bersumber dari Indonesian Family Life Survey (IFLS) East tahun 2012, dan dianalisis menggunakan model Probit. Fokus utamanya adalah mengisi kesenjangan literatur terkait kontribusi program pemberdayaan terhadap peningkatan derajat kesehatan di wilayah yang kurang terlayani dan tertinggal. Hasil analisis menunjukkan bahwa program dasawisma memiliki pengaruh positif dan signifikan terhadap kesehatan perempuan. Peserta program PKK memiliki kesehatan yang lebih baik dibandingkan non-peserta. Sebaliknya, keterlibatan dalam program apotik hidup dan dana sehat tidak menunjukkan dampak yang signifikan terhadap perbaikan status kesehatan di Papua dan kawasan timur Indonesia. Faktor lain seperti tingkat pendidikan yang lebih tinggi dan domisili di wilayah perkotaan berpengaruh positif terhadap tingkat kesehatan perempuan, sedangkan faktor usia dan jarak ke fasilitas kesehatan berpengaruh negatif. Temuan penelitian memperkaya literatur mengenai pemberdayaan perempuan berbasis komunitas, khususnya di wilayah tertinggal, serta menegaskan pentingnya penguatan peran sosial

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perempuan melalui dasawisma sebagai strategi peningkatan kesehatan. Dari sisi kebijakan, diperlukan reorientasi program PKK agar lebih fokus pada interaksi sosial yang inklusif dan peningkatan kapasitas individu untuk mendukung kesejahteraan perempuan secara berkelanjutan.

Kata Kunci: *Pemberdayaan Kesejahteraan Keluarga (PKK), Kesehatan Perempuan, Papua, Kawasan Indonesia Timur*

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Introduction

Women's empowerment has become a key focus of sustainable development, particularly in regions where gender inequality continues to constrain the potential of women to contribute to economic, social, and political progress. In developing and underdeveloped countries, such as Indonesia, this issue is even more pressing, as deeply rooted patriarchal structures often limit women's opportunities in education, employment, and healthcare (Chaudhry & Lodhi, 2012; Jayachandran, 2015). The social dimensions of gender inequality result in asymmetrical power relationships that leave women vulnerable to discrimination, marginalization, and violence, all of which limit their capacity to participate in economic growth and broader societal development (Chen & Tanaka, 2022).

In Indonesia, women empowerment program commonly known as PKK the family welfare empowerment (FWEm), program is a government led initiative designed to address these challenges by empowering women, particularly those in rural and underdeveloped regions. The FWEm or PKK program targets housewives and women as central figures in household management, promoting community-based initiatives that enhance women's roles in health, education, and economic resilience. However, the effectiveness of the PKK program in achieving its health-related goals has not been extensively studied, particularly in the context of remote regions like Papua and Eastern Indonesia.

This study aims to assess the impact of the PKK program on women's health in Papua, with a comparative analysis of five other regions in Eastern Indonesia. The PKK's women empowerment initiatives, including the medicinal herb garden, health funds, and family groups (ten to twenty households), commonly known as *dasawisma*, are examined to determine their influence on improving women's health outcomes. This research uses a quantitative approach, analyzing secondary cross-sectional data from the Indonesian Family Life Survey (IFLS) East, 2012 using the Probit model. By doing so, the study seeks to address gaps in the literature related to the role of women empowerment programs in enhancing health outcomes in underserved and underdeveloped areas of Indonesia.

Literature Review

The existing literature on women's empowerment often emphasizes its importance for economic development, gender equality, and social justice. Numerous studies have highlighted the critical role of women in fostering economic growth and reducing poverty through increased participation in education and the labor market (Kabeer, 2005; Malhotra et al., 2002). However, there is a significant gap in the literature when it comes to exploring how women's empowerment initiatives directly impact health outcomes, particularly in the context of underdeveloped regions like Papua and Eastern Indonesia.

Limited focus on health-specific outcomes

While much of the literature on women's empowerment examines broad themes such as economic participation, decision-making autonomy, and political involvement, fewer studies focus explicitly on health outcomes. Studies that do touch on health tend to examine indirect pathways, such as how women's empowerment leads to better financial stability, which in turn may result in improved access to healthcare (Mainuddin et al., 2015). However, the direct relationship between participation in empowerment programs and specific health improvements, such as those facilitated by communal initiatives like the PKK, remains underexplored. This study aims to fill this gap by providing empirical evidence on how community-based programs, such as family programs, directly influence women's health.

Geographic disparities in research

Most existing studies on women's empowerment in Indonesia have been concentrated in more developed areas, such as Java and Sumatra, where infrastructure and access to services are better established. Few studies have explored how empowerment programs function in the context of Indonesia's most remote and underdeveloped regions, such as Papua, which face unique challenges, including geographic isolation, limited healthcare infrastructure, and deeply entrenched social norms (Bahrudin et al., 2022). The lack of focus on these regions in previous research leaves a critical gap in understanding how well national initiatives like the FWEm (PKK) can be adapted to address the specific needs of women in these challenging environments.

Effectiveness of communal programs in health empowerment

While group-based empowerment programs have been shown to foster social capital and community participation, their specific effects on health outcomes have not been thoroughly investigated. The PKK's family group program (*dasawisma*) provides a potentially powerful model of community-based health empowerment, yet its role in directly improving women's health has not been a central focus of previous research. Existing studies tend to focus on broader outcomes such as economic empowerment or household decision-making (Pradhan et al., 2023), without delving into the health-specific benefits of such programs. This study addresses this gap by using quantitative analysis to assess the direct health impact of participation in family groups.

Mixed results on health funds and medicinal herb gardens

Previous literature has also provided mixed results on the effectiveness of health-related initiatives like medicinal herb gardens and health funds. For example, some studies suggest that community-based herbal medicine initiatives can improve health outcomes by increasing access to affordable, natural remedies (Ross et al., 2015). However, in regions like Papua, where cultural practices and healthcare preferences may differ, the uptake and effectiveness of such programs remain uncertain. Similarly, the impact of health funds-typically designed to provide financial support for healthcare-varies widely depending on the level of funding and the efficiency of its allocation (Karlina, 2019). This study contributes to the literature by providing region-specific insights into the effectiveness of these programs in the context of Papua and Eastern Indonesia.

Role of education and infrastructure. Several studies have demonstrated the importance of education and household infrastructure in improving women's health (Jayachandran, 2015; Laksono et al., 2022). However, there is still a gap in understanding how these factors interact with empowerment programs like the FWEm (PKK) in remote regions. For instance, while

education is known to improve health literacy and access to healthcare, the extent to which it enhances the effectiveness of communal programs like family group has not been fully explored. Similarly, the role of infrastructure, such as access to health centers and household facilities, in shaping the success of empowerment programs remains an area that requires further investigation. This study expands on these themes by examining the interaction between education, infrastructure, and participation in PKK programs in influencing women's health.

By addressing these gaps, this research not only contributes to the broader literature on women's empowerment and health but also offers practical insights for policymakers aiming to improve health outcomes for women in underdeveloped regions. The findings emphasize the importance of tailoring empowerment programs to the specific cultural and geographic contexts of remote areas like Papua, where unique challenges require innovative solutions.

Data and Research Methods

This is a quantitative study using secondary data from cross-sections sourced from the Indonesian Family Survey (IFLS) East 2012 (Rand Social and Economic Well-Being, 2012). The data used in the research were taken from the PKK programs in the community empowerment section of the community modules. These modules discuss the characteristics of the subjects. Community characteristics were taken from modules 1 and 2 and household characteristics from module 2, while individual characteristics were obtained through modules 3 and 4.

This research has three variables, namely dependent variable, independent variable, and control variable. The dependent variable in the research is the quality of women's health status as measured through self-reported health. Although self-reported health is widely utilized in survey-based research, it is essential to acknowledge its inherent limitations. Self-reported health is subjective by nature and may be influenced by individual perceptions, reporting biases, and cultural variations in interpreting health status. These factors can potentially affect the reliability and comparability of responses across individuals and regions. In the context of this research, the use of self-reported health is primarily driven by data availability, as the IFLS East 2012 dataset lacks comprehensive objective health indicators such as clinical evaluations or biomarkers. Given these constraints, self-reported health serves as the most feasible proxy for assessing overall health status. By addressing these limitations and providing a clear rationale for this methodological choice, the study enhances its transparency and supports a more contextual interpretation of the findings.

The independent variable consists of female welfare empowerment (FWEm) or PKK programs which are seen through three main programs in the health sector, namely medicinal herb garden, health funds and family group. Insurance, one of two control variables, is ownership of health insurance by women such as BPJS (Social Security Administrator that Administers Health Insurance) or other health insurance services. The control variables consist of socio-demographic status. There are three characteristics of subjects in this variable, namely individual, household, and community. (see table 1)

Individual characteristics include educational status, employment status, age, and marital status. Household characteristics include household access to sources of drinking water, toilets, and fuel. Community characteristics are proxied through the availability of public facilities such as the number of health centers and community weighing post as well as the location of residence either in urban or rural areas. The operational definitions of the variables used in this research are as follows table 1.

Table 1: Operational Variables

Variables	Operational Definitions
Health	Dummy is healthy (1), is not healthy (0)
Medicinal herb garden	Dummy has herbal garden program in the community (1), has none (0)
Health fund	Dummy has health funds in the community (1), has none (0)
Family groups	Dummy has 10 to 20 families care teams in the community (1), has none (0)
Education duration	Time spent in education (years)
Work	Dummy has a job (1), has no job (0)
Age	Age (year)
Marriage status	Dummy is currently married (1), has no married (0)
Insurance	Dummy has health insurance (1), has none (0)
Private toilet	Dummy has a private toilet with a septic tank (1), has none (0)
Fuel	Dummy has fuel for cooking using electronics and gas (1), has none (0)
Domicile	Dummy lives in the city (1), lives in rural (0)
Distance	Distance from the community to the town of regency/municipality (km)
Health center	Number of health centers in the community
Community weighing post	Number of communities weighing pos in the Community

Source: IFLS EAST Data, 2012

This research specifically deals with the impact of women empowerment programs through communal activities facilitated by PKK which focuses on the improvement of women's health status in Papua and West Papua provinces recorded in IFLS East 2012 report. This record is then compared with 5 regions, namely East Nusa Tenggara, East Kalimantan, Southeast Sulawesi, Maluku, and North Maluku. Women's health improvement status may be measured through three main PKK activities, namely medicinal herb garden, health funds, and family group (*dasawisma*).

This is very important for the family. Herbal plants may be planted in the family's yard which may provide daily health needs for the family. Medicinal plants that are often planted in gardens include *betel*, *turmeric*, *ginger*, *kaempferia galanga*, *curcuma zanthorrhiza*, *hibiscus*, *gynura divaricata*, *green chireta*, *pluchea Indica*, *guava*, *starfruit*, *gomphrena globose*, *cloves*, *pomegranate*, *lime*, *orthosiphon aristatus*, *mangosteen*, and *tomatoes*. The use of family herbal garden is generally used for the treatment of family health problems experienced based on general symptoms such as fever, cough, stomachache, and itching. The herbal garden can be used as an alternative to traditional medicine when a family member is sick. It is easiest to find, does not cost money to buy, and has much lower side effects than chemical medicines.

Health funds are funds allocated by the regional government to support programs and activities in the health sector through partnerships with Family Welfare Empowerment (FWEm) mobilization teams in the local area. Family group (*dasawisma*) is a group or an organization of mothers consisting of ten to twenty neighboring households. Family group is the smallest civilian organization formed for common interest and managed transparently. It provides information on how to live together as a community. It is also a forum that has a very important role in implementing government programs in the health sector which are under the auspices of the Family Welfare Empowerment (FWEm) or PKK movement at the village level.

The estimation model used here is probability unit regression (probit). The probit model is a non-linear estimation model used to analyze the relationship between the dependent variable and the independent variable which have dichotomous values of 0 and 1. The probit regression method uses the normal cumulative distribution function (Φ) in explaining the function of the equation. As the dependent variable in this model is binary, it follows a binominal distribution which is dichotomized in the values of 0 and 1 (Ruspriyanty & Sofro, 2018; Noreen, 1988). Probit estimation is widely employed in research due to its effectiveness in analyzing a dependent variable (Y) representing health status, which is categorized as either nominal or binary (Schneider *et al*., 2012).

The general equation of the probit estimation model is as follows:

$$Probit[\pi(x)] = \alpha + \beta x \quad (1)$$

The probit equation can also be as follows:

$$\Pr(Y = 1 \mid X) = \phi(X'\beta) \quad (1)$$

or

$$F(x) = \Pr(y = 1 \mid x) = \int_{-\infty}^{x} \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}(x)^2\right) dx \quad (2)$$

The transformation function in the probit model is the cumulative distribution function (CDF) of the standard normal distribution. The estimation model is as follows:

$$QHealthWikt = f(FWEm\ programs, Insurance, Individual\ Characteristics, Haousehold\ Characteristics, Community\ Characteristics) \quad (4)$$

$$QHealthWikt = ao + \beta 1Zti + \beta 2Insurancei + \beta 3ICi + \beta 4HHCi + \beta 5COMCi + \mu i \quad (5)$$

Where *QhealthWikt is a measure of the quality of women's health status as a dependent variable measured with self-reported health. Three FWEm (PKK) programs as one cap Z t i. The independent variables are herbal gardens, health funds, and family group (dasawisma)., two cap I. n s u r a. n c e i. as a control variable, three cap I. cap C i. is individual characteristics, four cap H cap H cap C i. is household characteristics, and five cap C cap O cap M cap C i. s community characteris*tics.

Finding and Discussion

The object of this research is the health status of women in Papua who had been exposed to the women's health empowerment program through FWEm or PKK activities and movements, namely medicinal herb garden, health funds, and family group. As reported in table 2, there are 724 women involved in the FWEm programs.

The dimensions of women's health status were measured using women's self-reported health in the IFLS East questionnaire. Women's health status is expressed by whether a woman was healthy with a score of 1 and unhealthy with a score of 0. The average number of women who said they were healthy is 74 percent with a standard deviation of 0.44. The herbal gardens program was expressed in binary. It gets a value of 1 if exposed to and receiving an herbal garden empowerment program by utilizing the home yard and potential land and it scores a value of 0 if not exposed to the program. On average, 52 percent of women who were members of the FWEm communal empowerment implemented an herbal garden program with a standard deviation of 0.50.

Table 2: Descriptive Statistics for The Papua

Papua	Count	Mean	StDev	Min	Max
Health	724	0.74	0.44	0	1
Medicinal herb garden	724	0.52	0.50	0	1
Health funds	724	0.13	0.34	0	1
Family group *(dasawisma)*	724	0.42	0.49	0	1
City	724	0.67	0.47	0	1
Distance	724	30.06	36.73	0	180
Community weighing post	724	2.65	2.53	0	10
Health center	724	1.64	0.66	0	4
Private toilet	724	0.51	0.50	0	1
Fuel	724	0.02	0.13	0	1
Age	724	35.31	13.44	0	75
Marriage	724	0.74	0.44	0	1
Education duration	724	7.48	4.83	0	18
Employment	724	0.73	0.45	0	1
Insurance	724	0.49	0.50	0	1

Source: IFLS EAST Data, 2012

About 13 percent of the health funds were disbursed to improve the health level of women who were members of the FWEm program. The budgeted health funds were still minimal to encourage communal women's health empowerment in Papua and West Papua. Meanwhile, those women who joined the family group program were 42 percent with a standard deviation of 0.49. Health funds are also measured based on a binary variable. It was a value of 1 if they were part of the family group empowerment and a value of 0 if they were not part of the group.

Then, ownership of health insurance can be a strong predictor of women's health empowerment. About 49 percent of women accessed health insurance with a standard deviation of 0.50. The dimensions of individual characteristics proxied through employment status show that an average of 73 percent of women worked for wages. The average length of education spent was 7 years with a maximum of 18 years. The average productive age of women was 35 years old. The women in the research sample were between 15 and 75 years old. Seventy-four (74) percent of these were married.

Household characteristics were measured based on household facilities such as the availability of toilets and the use of fuel. On average, 50 percent of households had private toilets with septic tanks and 2 percent on average households used fuel with electricity and gas. This shows that households in Papua which had been exposed to the FWEm programs were categorically poor. As for the dimensions of community characteristics, there were 2 integrated services post and 1 community health center in each village. The distance from the community to the district/city capital was about 30 km with an average of 67 percent of households living in the urban areas.

Table 3: Descriptive Statistics of Other Eastern Indonesia

Other Eastern Regions	Count	Mean	StDev	Min	Max
Health	2207	0.71	0.45	0	1
Medicinal herb garden	2207	0.51	0.50	0	1

Other Eastern Regions	Count	Mean	StDev	Min	Max
Health funds	2207	0.19	0.39	0	1
Family group	2207	0.77	0.42	0	1
City	2207	0.66	0.47	0	1
Distance	2207	59.25	86.67	0	450
Community weighing post	2207	3.62	4.97	0	38
Health center	2207	1.35	0.54	0	3
Private toilet	2207	0.51	0.50	0	1
Fuel	2207	0.14	0.34	0	1
Age	2207	37.07	14.76	15	98
Marriage	2207	0.71	0.45	0	1
Education duration	2207	7.73	4.37	0	18
Employment	2207	0.69	0.46	0	1
Insurance	2207	0.41	0.49	0	1

Source: IFLS EAST Data, 2012

Table 3 shows descriptive statistics of 5 other regions, namely East Nusa Tenggara, East Kalimantan, Southeast Sulawesi, Maluku, and North Maluku. As can be seen in Table 3, the number of observations in the 5 regions is 2207, which is greater than the number of observations in the 2 provinces of Papua and West Papua as shown in Table 2 above. The average number of women who said they were healthy in these 5 regions is 71 percent which is smaller than the average number in the Papua. The average exposure of women to the medicinal herb garden program is 51 percent. The health funds budgeted for each FWEm program for empowering women's health in the communities being fostered is an average of 19 percent. The average of women who were members of the Family group *(dasawisma)* program is 77 percent in these 5 regions. However, women's ownership of health insurance is on average 41 percent smaller than that of health insurance in Papua. As for the individual dimension, the average age of women is 37 years old with a minimum age of 15 years old and a maximum age of 95 years, old. Seventy-one (71) percent of these women were married. Then the average time spent on education was 8 years which is higher than that in Papua. In terms of employment, an average of 69 percent of the women in these 5 regions worked and earned wages. As for the dimension of household characteristics, an average of 51 households had their toilet in the house with a septic tank and 14 percent of them used electricity and gas as fuel.

The next dimension is the characteristics of the community. This was measured by the availability of access to public facilities in the health sector. Every village had 3 integrated service posts and 1 community health center. The distance between their villages to the city or town of the district was an average of 59.25 km, which is further than that in Papua. An average of 66 percent of these women lived in cities compared to those who lived in villages.

Women's empowerment is widely recognized as a multidimensional and transformative process that enables individuals, particularly women, to gain control over their lives, make strategic decisions, and pursue outcomes that reflect their values and interests. According to Ross et al., (2015), empowerment involves both a process of transformation and an individual's agency in asserting autonomy and making meaningful choices. Building upon this conceptual foundation, Kabeer (1999) proposes a widely adopted framework that explains empowerment through the interconnected dimensions of resources, agency, and achievements.

The concept of resources refers to women's access to material, human, and social assets that enhance their ability to participate fully in various aspects of life. These resources may include education, healthcare, financial capital, and social support networks that provide the foundation for action. Within the PKK program, resource access is evident in activities that promote knowledge improvement, skill-building, access to health services, and training for household economic resilience. Health status, as emphasized by Malhotra et al., (2002), is considered a key resource that significantly influences productivity and active participation in economic and social domains.

Agency reflects women's capacity to define goals and act upon them, including the ability to make choices and to challenge norms or decisions that do not align with their interests or values. As discussed by Kabeer (2005) and Ross et al., (2015), the agency highlights women's role as decision-makers and initiators of change. In the PKK context, this dimension is supported through the active involvement of women in program planning, group discussions, and leadership roles within neighborhood units such as *dasawisma*. These participatory mechanisms foster confidence, autonomy, and collective decision making, positioning women not only as program beneficiaries but also as drivers of change within their communities.

Achievements refer to the concrete outcomes that result from improved access to resources and enhanced agency. These outcomes can be observed through increased family welfare, greater involvement in productive activities, and enhanced social recognition of women's contributions at the community level. Within the PKK framework, these achievements indicate the realization of empowerment as both an individual and collective phenomenon.

Probit model estimation is used to analyses the women's empowerment movement through the PKK and its influence on improving women's health status in the Papua and compare it with those in the other 5 regions. Table 4 below shows that the implementation of medicinal herb garden and health funds programs of the PKK movement did not affect improving women's health status in the Papua with values of -0.119 and -0.122 respectively. The medicinal herb garden and health fund programs were not effective in influencing the health status of women in eastern Indonesia. Public awareness of using home gardens to plant herbal plants was still minimal. Then the health funds and budget for the FWEm movement that were allocated by the government were based on their financial capabilities and regional incomes. Limited regional financial capacity resulted in the efficient allocation of funds for the PKK movement.

Of the three main PKK programs that nourish women's health empowerment, the one with a positive and significant effect was the family group program, which was 0.253 with an average marginal effect (AME) of 0.779. Data show that women who lived in communities that had been exposed to the family group program had an average probability of being healthy which is 7.79 percent higher than women who lived in communities that had not been exposed to the program. Similar results were shown by other regions such as the provinces of East Nusa Tenggara, East Kalimantan, Southeast Sulawesi, Maluku, and North Maluku. The FWEm programs of medicinal herb garden and health fund programs showed no significant effect, but the family group program exhibited a positive and statistically significant correlation with women's empowerment, with a coefficient of 0.140.

Family group is the smallest women's group in the PKK program at the neighbourhood level governing body (known as RT), consisting of 10 to 20 heads of families. The Family group team is tasked with mobilizing and developing the community in the neighbourhood so that the PKK program can be properly implemented (Hartati, 2020). Family group (*dasawisma*) is

seen as strategic social capital that influences women's participation in empowering health status in Papua. Family group was formed to encourage and increase women's participation in society. Women in Papua is proactive in forming social groups and networks to meet their community's needs, especially household needs. Women empowerment groups, formed as part of the PKK, family group program, have the capabilities, skills, and knowledge regarding health, access to health facilities, and information regarding the need for improvement in women's health status.

PKK group members carry out various family group programs such as actively holding training, regular meetings between empowerment groups, health checks, and other related programs. According to Mulyanti & Astuti (2022), empowering women groups as part of family group programs such as conducting massive training could increase their knowledge about health information. Furthermore, empowering the family group or PKK group is seen as effective in improving health status starting from PKK members and other smallest groups, namely family and closest neighbours.

The ownership of health insurance by women in Papua and 5 (five) regions of Eastern Indonesia, as a control variable, does not have a significant effect on improving women's health status. Owning health insurance should be an indication of women's ability to access health facilities. However, most of women in Eastern Indonesia do not have the autonomy to access health insurance due to household financial instability. Socioeconomic factors such as employment status and household finances are the main obstacles for women to have health insurance (Laksono et al., 2022).

Individual characteristics such as marital status and employment status of women in Papua do not have a significant effect on improving women's health status, the same holds for those in the 5 other regions of Eastern Indonesia. However, education level and age have a significant effect on women's health status. Those women who had higher education in Papua and West Papua could improve their health status by 0.0258 with an average marginal effect of women being healthy of 0.79 percent. Meanwhile, women's health status in East Nusa Tenggara, East Kalimantan, Southeast Sulawesi, Maluku, and North Maluku increased by 0.73 percent with every level of education they earned. Education is a fundamental human right and an important tool for achieving gender equality and women's empowerment. Women with a higher level of education can improve their skills and knowledge about health, access health facilities, and encourage women's autonomy in making choices for treatment for physical and mental health which generally affects all their lives.

Table 4: Probit Model Estimation and Average Marginal Affect (AME)

Variables	Papua_Probit	Papua_AME	Other_Probits	Other AMEs
Medicinal herb garden	-0.119	-0.0366	0.101	0.0325
	(0.122)	(0.0374)	(0.0641)	(0.0206)
Health fund	-0.122	-0.0373	-0.0314	-0.0101
	(0.190)	(0.0582)	(0.0786)	(0.0254)
Family group	0.253*	0.0779*	0.140*	0.0452*
	(0.135)	(0.0413)	(0.0721)	(0.0232)
City	0.454***	0.139***	-0.0950	-0.0306
	(0.169)	(0.0512)	(0.0869)	(0.0280)
Distance	-0.00417***	-0.00128***	0.000634	0.000204

Variables	Papua_Probit	Papua_AME	Other_Probits	Other AMEs
	(0.00154)	(0.000467)	(0.000398)	(0.000128)
Community weighing post	0.0460	0.0141	0.00327	0.00105
	(0.0307)	(0.00938)	(0.00836)	(0.00270)
Health center	-0.118	-0.0362	-0.0182	-0.00588
	(0.0917)	(0.0281)	(0.0590)	(0.0190)
Private toilet	0.0774	0.0238	0.0407	0.0131
	(0.128)	(0.0393)	(0.0673)	(0.0217)
Fuel	-0.841**	-0.258**	0.261**	0.0842**
	(0.334)	(0.101)	(0.105)	(0.0339)
Age	-0.0126***	-0.00388***	-0.0131***	-0.00422***
	(0.00448)	(0.00135)	(0.00224)	(0.000706)
Marriage	-0.122	-0.0375	-0.0572	-0.0185
	(0.122)	(0.0375)	(0.0659)	(0.0213)
Education duration	0.0258*	0.00791*	0.0228***	0.00734***
	(0.0151)	(0.00461)	(0.00832)	(0.00267)
Employment	0.0296	0.00909	-0.0114	-0.00368
	(0.125)	(0.0384)	(0.0668)	(0.0215)
Insurance	-0.123	-0.0378	-0.0422	-0.0136
	(0.116)	(0.0357)	(0.0612)	(0.0197)
_cons	0.890***		0.799***	
	(0.309)		(0.186)	
N	724	724	2207	2207

Source: The Data is Processed from IFLS East 2012

Then, the age variable shows a negative correlation of -0.0126 in the Papua and 0.00422 in the other 5 regions. The average probability of women being unhealthy was 0.3 percent and 0.4 percent, respectively. The age variable in the Papua exhibited a negative correlation of -0.0126, while in the other 5 regions, it was -0.00422. The average probability of women being unhealthy was 0.3 percent in the former and 0.4 percent in the latter. Thus, every increase in women's age has an impact on the decline in women's health status throughout Eastern Indonesia.

The report in Table 4 shows that household characteristics, namely owning a toilet with a septic tank did not have a significant effect on improving women's health status in all regions of Eastern Indonesia. Households that used electricity and gas as fuel in Papua affected decreasing women's health status by 0.841 points with the AME value of the average probability of women being unhealthy of 25 percent. In contrast, in East Nusa Tenggara, East Kalimantan, Southeast Sulawesi, Maluku, and North Maluku where households that used electricity and gas as fuel had a significant impact on improving women's health status by 0.261 with an average probability of women being healthy of 0.84 percent as indicated by the AME value.

Then, community characteristics, namely the number of communities weighing post (commonly known as Posyandu) and community health center (commonly known as Puskesmas) availability, did not have any significant effect on the health status of women in

Papua and other regions of Eastern Indonesia. Meanwhile, community residence in urban areas of Papua had a positive effect on improving women's health status by 0.454 points with an average probability of women being healthy of 13 percent compared to the other areas that do not show a significant effect.

The last point to consider is distance. The distance between the provincial capital and the district per kilometer shows that the longer distance has an impact on reducing women's health status by 0.00417 points.

The average probability (AME) of women being unhealthy in Papua is 0.12 percent. The availability of health facilities is still minimal in the districts as most of these facilities are concentrated in the capital cities of these two provinces. As a result, the women may not have access to health services for themselves and their families. However, other Eastern regions of Indonesia such as East Nusa Tenggara, East Kalimantan, Southeast Sulawesi, Maluku, and North Maluku show positive results and have no significant effect on women's health status.

Access to health services is a strong contributor to the empowerment of women's groups through the PKK program. Women's access to health facility services can be seen through the distance from their residence to health service centers. The closer the distance, the easier it is for women to access and be exposed to various health service programs. The farther the distance, the more difficult it is for women to access these (Asaolu et al., 2018).

Findings

This study identified several key findings. The family group program (*dasawisma*) significantly improved women's health, as participants showed a higher probability of good health compared to non-participants. In contrast, the medicinal herb garden and health fund programs did not show a significant effect on improving women's health in Papua and other eastern regions. Additionally, higher education levels and urban residency positively influenced women's health. However, age and distance to health facilities negatively affect health status.

The study highlights the importance role of family-based community programs for empowering women in Papua, stressing that targeted action and greater dissemination of health knowledge through community groups are needed to improve health outcomes. As well as emphasizes the effectiveness of communal women's empowerment programs and suggests further improvements for health interventions.

Expanded Discussion

The Role of Women in Development

Women play a critical role in sustainable development, particularly in underdeveloped and developing regions like Papua and other parts of Eastern Indonesia. However, women in these regions often face gender discrimination, marginalization, and vulnerability to violence, which limits their contributions to economic growth and community well-being (Jayachandran, 2015). Strengthening women's empowerment through gender-sensitive programs is crucial in overcoming these barriers and enabling their full participation in development initiatives (Kabeer, 2005).

Women Empowerment and Health

Empowerment is a multidimensional process that influences women's access to resources, control over life decisions, and autonomy in areas like education, employment,

and health (Malhotra et al., 2002). Health, as a fundamental human right, is a significant part of this empowerment process. Empowered women are more likely to take control of their health, make informed decisions, and access healthcare services, all of which contribute to better outcomes not only for themselves but also for their families and communities (Sen & Batliwala, 2000).

Empowerment in health also includes addressing structural barriers, such as distance from healthcare facilities, lack of health insurance, and socio-economic constraints, which are prevalent in underdeveloped areas like Papua and West Papua (Asthana, 1996). In these regions, communal initiatives such as those organized by the Family Welfare Empowerment (PKK) program are essential in filling gaps where formal healthcare services are limited.

The Family Welfare Empowerment (FWEm) Program and Its Impact

The Family Welfare Empowerment (FWEm), commonly known as PKK movement in Indonesia is a government-led initiative aimed at improving the welfare of women and families, particularly in rural and disadvantaged areas. It functions as a communal empowerment platform, focusing on various aspects of family life, including health, education, economic resilience, and environmental sustainability (Directorate General of Village Government Development, Ministry of Home Affairs, 2021).

In the context of Papua and Eastern Indonesia, the PKK has played a pivotal role in promoting women's health through three key programs, medicinal herb gardens, health funds, and family groups. Each of these programs aims to foster community-based health initiatives, providing women with knowledge and resources to take care of their families' health needs. However, the effectiveness of these programs varies, as highlighted in this study.

The family group program (*dasawisma*), a communal women's organization at the neighborhood level, showed the most significant positive impact on women's health. Within the institutional governance structure of the Family Empowerment and Welfare Movement, it functions as a community-based women's organization established and managed by PKK groups at the neighborhood (RT) level. These groups are responsible for implementing the Ten Main PKK Programs, tailored to the available resources and capacities of each RT-level PKK unit.

This study finds that the *dasawisma* group has a positive and most significant impact on women's health compared to other types of empowerment activities. Women who participate in this program are 7.79% more likely to report being in good health than those who do not participate. This empirical finding supports previous research indicating that group-based activities are among the most effective mechanisms for empowering women, particularly in the health domain (Pradhan et al., 2023; Ross et al., 2015).

The *dasawisma* serves as a form of localized social capital that enables women to share knowledge, provide mutual support, and collectively address health issues within their communities. Such communal engagement fosters self-confidence, enhances decision making capacity, and nurtures women's leadership roles, each of which is a fundamental element in the empowerment process (Kabeer, 2005; Malhotra et al., 2002). Sen (1999) emphasizes that empowerment involves not only access to resources but also the expansion of capabilities and agency, processes that often evolve through participatory, group-based activities.

Complementary evidence is provided by Mohapatra and Sahoo (2016), who show that women participating in self-help groups in India experience significant improvements

in health knowledge, intra-household negotiation skills, and involvement in social decision making. These group dynamics not only facilitate access to health-related information but also foster mutual trust and solidarity among members, thereby enhancing the program's impact on both individual and collective well-being.

Empirical studies from Indonesia further support these dynamics. Pangaribowo, Tsegai, and Sukamdi (2019) demonstrate that community-based women's groups contribute significantly to positive health behavior and improved household nutrition. Similarly, the World Bank (2012) highlights how grassroots platforms enhance access to health services and knowledge for marginalized women. At the national level, Sugiyanto (2015) and Pegu (2015) reveal that grassroots women's organizations such as dasawisma play a vital role in reducing inequalities in health and social participation by leveraging solidarity, trust, and collective responsibility.

Moreover, Mehtap et al. (2016) find that structured participation in women's groups through education, dialogue, and collective action significantly boosts self-confidence and promotes proactive health-seeking behavior. Taken together, these findings affirm that dasawisma operates not only as a health intervention platform but also as a strategic space for cultivating women's agency and empowerment at the community level.

The family group program (dasawisma) acts as a form of social capital, providing women with a platform to share knowledge, support each other, and collectively address health issues in their communities. This type of communal engagement fosters a sense of agency and leadership among women, which is crucial for empowering them to make decisions that improve their health and well-being (Kabeer, 2005).

Limited Impact of Medicinal Herb Gardens and Health Funds

In contrast, the medicinal herb garden and health fund programs did not significantly affect women's health in Papua and Eastern Indonesia. The minimal impact of these programs could be due to several factors:

Medicinal Herb Gardens

While the concept of herbal gardens is beneficial, awareness and utilization of medicinal plants in these regions remain low. This may be due to limited knowledge about the health benefits of herbal remedies or a preference for conventional medicine, which could hinder the full potential of this program.

Health Funds

The health fund program's limited effect may stem from insufficient financial resources allocated to the initiative. In underdeveloped regions like Papua, local governments often face financial constraints, limiting the reach and effectiveness of such programs. Additionally, bureaucratic inefficiencies may also affect the timely disbursement and utilization of funds (Bahrudin *et al.,* 2022).

Role of Education in Health Empowerment

1. Education Emerged as A Significant Factor Influencing Women's Health

Women with higher educational attainment reported better health outcomes, reflecting the role of education in empowering women to access and use health resources effectively (Jayachandran, 2015). Educated women are more likely to seek healthcare, make

informed health choices, and advocate for their own and their families' health needs (Laksono et al., 2022). This finding underscores the importance of integrating educational initiatives into empowerment programs like the PKK.

2. Health Insurance and Accessibility Issues

Despite the availability of health insurance programs like BPJS (Social Security Administrator for Health), ownership of insurance did not significantly impact women's health in these regions. This may be due to financial instability in households, preventing women from consistently paying insurance premiums, or logistical issues that limit access to healthcare services even with insurance coverage (Laksono et al., 2022). Additionally, the distance to healthcare facilities in rural and remote areas like Papua often presents a major barrier to accessing care, further exacerbating health inequities (Asaolu *et al*., 2018).

3. Importance of Geographical and Socioeconomic Factors

The study found that geographical factors, such as distance from healthcare centers and living in urban versus rural areas, significantly affect health outcomes. Women living in urban areas reported better health than those in rural settings, likely due to easier access to healthcare facilities and better infrastructure (Mainuddin et al., 2015). Similarly, households with access to modern amenities like private toilets and fuel (electricity or gas) also demonstrated better health outcomes, indicating that improving household infrastructure can be a critical component of women's health empowerment.

Recommendations for policy and future interventions

To enhance the effectiveness of women's health empowerment programs in Papua and other Eastern Indonesian regions, several policy recommendations can be made:

Strengthening Community-Based Health Programs

Building on the success of the *dasawisma* program, policymakers should consider expanding its scope and reach to cover more women in rural and underserved areas. Training sessions, health check-ups, and peer education within these groups can foster greater health awareness and improve outcomes.

Increase Funding for Health Initiatives

Addressing the limited impact of health funds requires increased financial support from both local governments and external donors. Additionally, better financial management and allocation of resources are necessary to ensure that health funds reach the intended beneficiaries in a timely manner.

Promote Educational Opportunities for Women

Since education is closely linked to better health outcomes, initiatives that promote girls' and women's education should be prioritized. Adult education programs focusing on health literacy could also empower women to make informed health decisions.

Improve Healthcare Infrastructure

To mitigate the negative impact of geographical barriers, efforts should be made to improve healthcare infrastructure in rural areas. Mobile health clinics, telemedicine services, and community health workers could help bridge the gap between women and the healthcare system in remote regions.

Conclusion

This study underscores the essential role of family-based community programs in empowering women's health in Papua and Eastern Indonesia, with the Family Welfare Empowerment (PKK) program emerging as a central driver. The findings demonstrate that the family group program (*dasawisma*) has a significant positive impact on improving women's health, as participants exhibited better health outcomes compared to non-participants. In contrast, the medicinal herb garden and health fund programs showed limited effectiveness, likely due to challenges such as low public awareness, financial constraints, and logistical barriers. The study also identifies education as a key factor in enhancing women's health, as higher educational attainment correlates with better health outcomes. Additionally, geographical barriers, such as distance to healthcare facilities, and socio-economic factors, such as urban residency, were found to be critical determinants of health status.

The study's recommendations emphasize the need to expand successful community-based programs, such as *dasawisma*, and increase funding for health initiatives. Moreover, promoting women's education and enhancing healthcare infrastructure are essential steps to address the existing geographical and socio-economic barriers. Strengthening these areas is expected to significantly improve women's health empowerment, leading to better health outcomes for women and their families in these regions. Despite the valuable insights provided by this study, several limitations must be acknowledged. First, the use of cross-sectional data from IFLS East 2012, which may no longer fully reflect current socio-economic and health dynamics in Eastern Indonesia, limits the ability to capture recent developments. Second, the reliance on self-reported health as the primary outcome variable introduces subjectivity and potential reporting bias, which may affect the accuracy of health assessments. These limitations highlight the need for future research using more recent and longitudinal data, as well as the incorporation of objective health indicators, to strengthen the robustness and generalizability of the findings.

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