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Community health worker empowerment through collaborative models with community midwifery

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ABSTRACT

From 2007 to 2015, Indonesia's maternal mortality rate (MMR) increased from 228/100,000 to 305/100,000 live births. The government has established a policy to reduce the MMR in rural and remote areas, which includes the maternal waiting home (MWH) program and the placement of community midwifery. However, the use of MWH in Indonesia, such as in South Sulawesi Province, remains low. This study aimed todetermine the impact of the community health worker (CHW) Empowerment Collaboration Model on the use of maternal waiting home (MWH). This was a quasi-experimental study with a control group and pre-post test design. This investigation was conducted at four community health centers in Bulukumba, South Sulawesi. A total of 125 pregnant women were selected for the study and divided into two groups: 66 in the experimental group and 59 in the control group. The collaborative empowerment model for CHWs was implemented in five stages. CHW provided the experimental group with education. In the experimental group, there were statistically significant increases in knowledge, attitude, and MWH use, whereas there were no statistically significant increases in the control group. Community health worker empowerment with a collaboration model significantly improves pregnant women's knowledge, attitudes, and MWH utilization outcomes (210%).

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1. INTRODUCTION

Maternal mortality rate (MMR) is the health indicator for pregnant women during the pregnancy, the labor, and the puerperal. MMR in Indonesia has increased from 228/100,000 in 2007 to 305/100,000 live birth in 2015. Six provinces in Indonesia are responsible for this issue by increasing MMR as much as 52.6%. One of the regions in South Sulawesi [1]. In South Sulawesi, the prevalence of MMR increased to 153/100,000 live birth in 2016 [2]. Sustainable development goals (SDGs) established the MMR target in 2015-2030 under 70/100,000 live birth [3].

The main issues in South Sulawesi's MMR are hemorrhage, hypertension during pregnancy, and others [2]. Postpartum hemorrhage and hypertention during pregnancy contributed to maternal death as

delays in treatment, poor of maternity care, delays in emergency care and delays in the management of deteriorating [4]–[7]. A study from Moyo *et al*. stated that the most contributing factor in maternity death is also late access to health facilities at a 5 km distance [8].

Maternal mortality can be reduced if health care providers meet patients needs without undue deleys using a deley prevention strategy, wichh is consistent with workers expectations [9]. Indonesia has made a lot of effort to prevent MMR by providing adequate maternal and child health care since 1989 through the midwives program. It is to assign trained midwives in every village by giving antenatal and prenatal service, family planning, reproductive system health care, and nutritional counseling [2]. The midwives are part of the community who act as the executors, the managers, and the educators in increasing public health collaborated with the community health workers in the respective areas [10].

The Ministry of Health Indonesia made policy for areas struggling to access health facilities by developing maternal waiting home (MWH) near health facilities, so it sought for pregnant women nearing their expected birth date to stay in MWH with their spouses [1]. In Bulukumba, South Sulawesi, the use of MWH in 2015 is very low; 10 pregnant women per year. Pregnant women do not use MWH because they do not become aware of the existence of MWH, they are part of marginalized women, and low knowledge of the purpose of MWH in the community, besides women are rarely involved in decision making in terms of health [11].

Research on strategies for improving maternal behavior through health education and technology strategies through sending messages has been shown to increase the use of health facilities for childbirth [12]–[14]. Empowerment community is also proven to be able to improve the health of mothers and children, and guide them to make the right decisions through community health worker (CHW) knowledge and training [15]–[19]. But community empowerment through CHW without being equipped with adequate knowledge will reduce the success of the program [20]. Therefore, it is important that CHW obtains training and guidebooks to increase in adequate their knowledge and confidence. This study uses a combination of strategies to enhance community empowerment through the role of CHW, the use of a screening manual and utilizing community midwives who work in this field together for improving the knowledge, attitudes and behavior of pregnant women in utilizing MWH. This study aims to determine the effect of the CHW empowerment collaboration model to enhance the use of MWH.

2. RESEARCH METHOD

The quasi-experiment method with the pretest-posttest control group design used in this study.The subject of this research is CHW, and the object used is pregnant women in the work area of Community Health Center in Bontobangun, Lembana, Borong Tappoa, and Tanete, Bulukumba district, Province of South Sulawesi, Indonesia, as the target population done in June 2017 to August of 2018. Province of South Sulawesi is one of the regions with high MMR in Indonesia. Bulukumba District was chosen because this area has a Maternity Waiting Home, which is used by pregnant women is still very minimal and even zero for a year. The Medical Ethics Committee of Universitas Muhammadiyah Yogyakarta Indonesia has approved this study (No. 133/EP-FKIK-UMY/III/2017). This research is the non-random sampling technique to determine the number of the intervention group, which was 66 pregnant women and the control group as much as 59 pregnant women.

This study of the experimental group uses the CHW empowerment collaboration model was carried out through 5 stages as shown in Figure 1. The first stage is CHW get training by trained midwives with effective communication materials and maternal health. In the second phase, CHW made a home visit to pregnant women. The purpose is to examine the problems of pregnancy and use a structured question guide to measure the level of knowledge and attitudes of pregnant women. The results of the home visit are assessed to determine the educational material of pregnant women that needs to be provided (the third stage).

Before giving educational material to pregnant women, CHW consulted the community midwifery (the fourth stage). After meeting with the community midwifery, CHW made another home visit to provide education to pregnant women according to the results of the stage 3/assessment (the 5 stage). Pregnant respondents who came from the control group did not get any intervention, except the first home visit to collect pretest data by untrained CHW. To reduce data retrieval bias, post-tests were conducted by research assistants rather than CHW.

The CHW empowerment training in this study using a Community Health Worker's Guidance Book: A guide to pregnant women data collection, a guide to report and discuss with community midwives, and a guide to education stage. Data collection in this study used a questionnaire to determine changes in knowledge and attitudes of pregnant women related to health and agreed to use MWH with a range of pretest. The intervention was given in three months, from the first stage until the fifth stage. The pre and posttest were collected by assistance researcher. Besides, researchers use a logbook to determine the number of pregnant women who use MWH before the intervention in 2017 and after the intervention in 2018.

The descriptive and bivariate analyses used as the analysis data. The descriptive analysis used for the increased use of MWH variable, meanwhile bivariate analysis is used to know the influence of collaborative model effective towards pregnant women increased knowledge and attitude. The statistical analysis model uses non-parametric tests Spearman Rank statistical test (knowledge variable) and Chi-square statistical test (attitude variable).

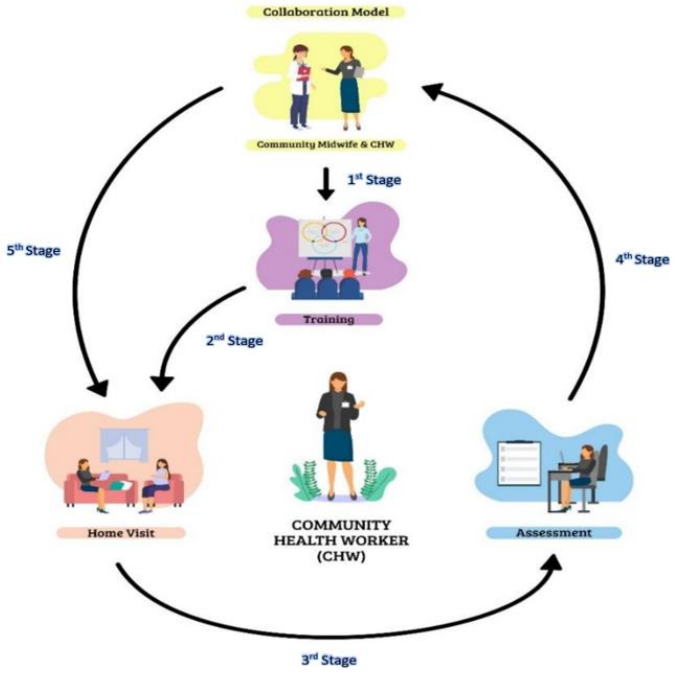

Figure 1. The community health worker empowerment collaboration mode with five stages

3. RESULTS AND DISCUSSION

3.1. The influence of increased knowledge between intervention group and control group before and after intervention

Table 1 shows the significant increase in pretest-posttest knowledge level in the intervention group with p=0.032 and r_s=0.26. It reveals that the collaborative model was effective in enhancing the knowledge of pregnant women related to health during pregnancy. Meanwhile, there is no significant increase in the pretest-posttest knowledge level in the control group with p=0.365 and r_s=-0.05.

Table 1. Rank spearman analysis towards pregnant women's increased knowledge between intervention group and control group as seen from mean, sd, rs and p-value score

Variable	Group		Mean	SD*	r_s†	p-value
Knowledge	Intervention	Pretest	58.08	4.316	0.26†	0.032ǂ
		Posttest	59.64	4.991		
	Control	Pretest	56.82	3.219	-0.05	0.365
		Posttest	57.86	4.329		

*SD=Standard deviation, †r_s=Spearman rho, ǂρ-value<0.05

3.2. The influence of increased attitude between intervention group and control group before and after intervention

Table 2 shows there is a significant increase in the pretest-posttest of pregnant women's attitudes in the intervention group with p-value=0.037. It reveals that 58 pregnant women agree to use MWH before community health workers' education, and after intervention, it increases into 63 pregnant women. However, there is no significant influence on the control group with p=0.110. It reveals that 29 pregnant women agree to use MWH before community health workers conduct home visits, and after that, it decreases into 22 pregnant women.

Table 2. Chi-square analysis toward pregnant women's attitude in utilizing mwh between intervention group and control group as seen from frequency distribution and p-value score

Variable	Group	Pretest[§]	Posttest[¶] Disagre (%)	Posttest[¶] Agree** (%)	Total (%)	p-value
Attitude	Intervention	Disagree	2 (25)	6 (75)	8 (12.1)	0.037[††]
		Agree	1 (1.7)	57 (98.3)	58 (87.9)[§]**	
		Total	3 (4.5)	63 (95.5)[¶]**	66 (100)	
	Control	Disagree	22 (73.3)	8 (26.7)	30 (50.8)	0.110
		Agree	15 (51.7)	14 (48.3)	29 (49.2)[§]**	
		Total	37 (62.7)	22 (37.3)[¶]**	59 (100)	

[§]Pretest, [¶]Posttest, **Agree, [††]ρ-value<0.05

3.3. The influence of using mwh between intervention group and control group

Table 3 reveals the influence of the use of MWH to intervention group after pregnant women got an education from the community health workers. In the intervention group, MWH in Bontobangun shows an increase from zero to two pregnant women in 2017 to 2018. Moreover, MWH in Kajang shows an increase from 11 to 35 pregnant women. There is no influence on the use of MWH in the control group in MWH in Tanete and Borang Rappoa with the data from 2017 to 2018, which is zero pregnant woman.

Table 3. The use of mwh analysis by pregnant women in 2017 and 2018 between intervention group and control group

Variable	Group	2017[††]	2018[§§]	Total (%)
The use of MWH	Intervention			
	MWH in Bontobangun	0 people	2 people	209
	MWH in Kajang	11 people	35 people	
	Control			
	MWH in Tanete	0 people	0 people	0
	MWH in Borang Rappoa	0 people	0 people	

[††]2017 (before intervention), [§§]2018 (after intervention)

The study shows that community empowerment through the collaboration of CHW with community midwives proved to be able to increase pregnant women to use MWH. Community empowerment begins with increasing the knowledge and skills of CHW, including effective communication techniques. This is in accordance with the principle of community empowerment, namely community-based education and partnerships. One important step used in this research is to build the self-confidence of the CHW through communication training and be able to identify the educational needs of pregnant women before giving health promotion to her. Collaboration with local community midwives provides the opportunity for CHW to prepare educational materials properly. These steps make the CHW able to provide good counseling to pregnant women. This model can improve the knowledge and attitude of pregnant women, and have a positive impact on using MWH in Bulukumba, South Sulawesi, Indonesia. Community health workers act as the bridge between the health care providers with the community who struggles in accessing health care. Community health workers are the officers who provide support and help to the community, family, and individuals, especially the mother and the child, through preventive and promotive effort and access curative health care [21], [22]. Community health workers in Ethiopia are the key to increase the health of mothers and newborns in rural areas [23], where pregnant women have limited access to health facilities, so that community-based health care can reach out to underserved populations [24].

World Health Organization (WHO) and UNFPA stated that CHWs who assigned in the community should have the competence in health education and counseling, offer quality care through effective communication, management, and promotion [25], so the CHWs need to have the knowledge, skills, and competences in health through training and work experience [26]. The effort to increase health through CHWs should focus on knowledge and skills about the pregnancy until the puerperium period [27].

Effective communication training is a strategy to increase self-confidence, knowledge, and develop community health workers' competencies [28], [29], and can provide safe care [29] about family planning and pregnancy (get antenatal care (ANC) since early and the benefit of ANC) as well as assisting during pregnancy to labor planning and identify complication for references [24], and improve health behavior, strengthen community relations with health services [30]. CHW who had received training must continue or refresher training because if it is not available, then CHW's skills and knowledge will soon be lost. The health worker must always provide support and oversee any CHW activities in the community, especially in providing health education [31].

The result of this study as shown in Table 1 shows that effective communication training for community health workers applied into education can significantly influence the pregnant women's knowledge level proven by p-value=0.032 ($p<0.05$) and coefficient correlation $r_s=0.26$ which means the better the implementation and application of effective communication training by community health workers, the better the level of knowledge increased of pregnant women. Increased knowledge of pregnant women in the intervention group occurred because the community health workers provided counseling about health during pregnancy. Community health workers who had a home visit and give health counseling for pregnant women had a positive impact on increasing mothers' knowledge about child health [32], [33]. Community health workers are responsible for giving health support to individuals and communities in facilitating health information access in knowledge enhancement in the community about a healthy lifestyle and the utilization of antenatal care for pregnant women [34].

Health education by giving health information makes an individual realizes to change and have knowledge after receiving information about the facts and insight. Knowledge is the part of cognitive is the first stage of absorbing information [35]; for example, in this study, knowing pregnancy danger signs and detection of pregnancy risk. However, theory-based interventions could affect changes in the behavior of a person or society, but the determinants of a person's behavior are not limited to knowledge and awareness, so the method used must include other factors besides increasing knowledge [36].

The result of this study as shown in Table 2, effective communication training for community health workers applied to education significantly influences the attitude of pregnant women toward the utilization of MWH proven by p-value=0.037 ($p<0.05$). WHO exposed that health education strategies target individuals/communities to prevent adverse health behaviors? knowledge, attitude, practices (KAP) model is the basic to enhance knowledge and support behavioral change, so with the knowledge enhancement, it is expected for them to have attitude change as well, and the outcome is behavioral health change [37], [38].

A study conducted in Iran showed that health education is an effective strategy to increase the attitude of pregnant women in choosing the labor method. Attitude is an affective component and shows what individuals like or dislike towards something [35], [39], so pregnant women will have a positive attitude towards MWH and agree to utilize it. Pregnant women who received health education about the danger of pregnancy and labor complications, as well as the benefit of MWH, are potentially going to utilize MWH [11], [40]. It shows that pregnant women understand their pregnancy condition, so it eases the mothers to use MWH.

Effective communication training applied to education takes effect on the enhancement of MWH utilization in the intervention group (MWH in Bontobangun and MWH in Kajang); meanwhile, there is no enhancement at all in control group (MWH in Tanete and MWH in Borang Rappoa) as shown in Table 3. There are no pregnant women utilized MWH in Bontobangun in 2017, and it increased to two pregnant women in 2018; meanwhile, MWH in Kajang has increased its utilization from 11 to 35 pregnant women since 2017-2018. Health education is a process in which people learn how to maintain the health of both individuals and the community. This makes people aware of their health, lifestyle, physical, and social settings. So health education is not limited to just transferring knowledge, but it is possible to apply knowledge effectively in considering, thinking, making decisions, and taking actions related to health [41]. Someone will consider behavior where knowledge is the basis of attitude before deciding to do something. So that attitudes based on relevant knowledge will result in better behavior [42]. In contrast to research in the Pune District of Maharashtra that pregnant women who get health education produce positive attitudes in improving health but in practice changes in behavior do not change much due to social-economic influence, lack of accessibility and other cultural, social factors [43].

The limitation of this study is related to evaluation tools for community health workers in effective communication training. The researchers do not have the exact measuring instrument to assess the health workers in giving health education, so it cannot know whether the community health workers are trained well to provide health education for pregnant women. We recommend other researchers to conduct further research so that they can control potential confounders.

4. CONCLUSION

This study reveales that effective communication training for community health workers and effective application of health education can enhance knowledge and attitudes of pregnant women. It also enhances the use of the Maternal Waiting Home. Besides, regular training and assistance from health workers are also needed to monitor the community health workers' skills, especially in providing health education to the community.

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REFERENCES

[1] Ministry of Health, "Indonesia Health Profile in 2017," 2018. [Online]. Available: https://www.kemkes.go.id/downloads/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-Indonesia-tahun-2017.pdf

[2] South Sulawesi Public Health Office, "Health Profile of South Sulawesi Province in 2016," 2017. [Online]. Available: https://dinkes.sulselprov.go.id/document/Profil%20Kesehatan

[3] World Health Organization, *Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals.*. Geneva: World Health Organization, 2015. [Online]. Available: https://apps.who.int/iris/handle/10665/200009

[4] D. A. Schwartz, "Hypertensive Mothers, Obstetric Hemorrhage, and Infections: Biomedical Aspects of Maternal Death Among Indigenous Women in Mexico and Central America," in Maternal Death and Pregnancy-Related Morbidity Among Indigenous Women of Mexico and Central America: An Anthropological, Epidemiological, and Biomedical Approach, D. A. Schwartz, Ed. Cham: *Springer International Publishing*, 2018, pp. 35–50. doi: 10.1007/978-3-319-71538-4_3.

[5] S. Voillequin, P. Rozenberg, P. Ravaud, and A. Rousseau, "Promptness of oxytocin administration for first-line treatment of postpartum hemorrhage: a national vignette-based study among midwives," *BMC Pregnancy and Childbirth*, vol. 22, no. 1, p. 353, Dec. 2022, doi: 10.1186/s12884-022-04648-5.

[6] A. H. Dagne and S. B. Zewude, "Postpartum haemorrhage and associated factors among mothers who gave birth in South Gondar Zone public health facilities, Ethiopia: a cross-sectional study," *Postgraduate Medical Journal*, vol. 98, no. 1162, pp. 598–603, Aug. 2022, doi: 10.1136/postgradmedj-2020-139382.

[7] M. A. Mahmood *et al.*, "Health system and quality of care factors contributing to maternal deaths in East Java, Indonesia," *PLOS ONE*, vol. 16, no. 2, p. e0247911, Feb. 2021, doi: 10.1371/journal.pone.0247911.

[8] N. Moyo, M. Makasa, M. Chola, and P. Musonda, "Access factors linked to maternal deaths in Lundazi district, Eastern Province of Zambia: a case control study analysing maternal death reviews," *BMC Pregnancy and Childbirth*, vol. 18, no. 1, p. 101, Dec. 2018, doi: 10.1186/s12884-018-1717-1.

[9] A. Dewi *et al.*, "Reducing Maternal Mortality: A Qualitative Study of Health Workers' Expectation in Urban Area, Indonesia," *Open Access Macedonian Journal of Medical Sciences*, vol. 9, no. T4, pp. 18–26, Mar. 2021, doi: 10.3889/oamjms.2021.5752.

[10] E. D. Wahyuni, *Community Midwifery Care*, (*in Indonesia: Asuhan Kebidanan Komunitas)*, 1st ed. Jakarta, 2018. [Online]. Available: https://kink.onesearch.id/Record/IOS15522.slims-175.

[11] T. Vermeiden, F. Braat, G. Medhin, A. Gaym, T. van den Akker, and J. Stekelenburg, "Factors associated with intended use of a maternity waiting home in Southern Ethiopia: A community-based cross-sectional study," *BMC Pregnancy and Childbirth*, vol. 18, no. 1, 2018, doi: 10.1186/s12884-018-1670-z.

[12] T. Alhaidari *et al.*, "Feasibility and acceptability of text messaging to support antenatal healthcare in Iraqi pregnant women: a pilot study," *Journal of Perinatal Medicine*, vol. 46, no. 1, pp. 67–74, Jan. 2018, doi: 10.1515/jpm-2016-0127.

[13] A. Dewi, S. Supriyatiningsih, and D. Sugiyo, "Collaboration Model for Community Health Worker Empowerment to Enhance the Use of Maternity Waiting Home," in *Strengthening Hospital Competitiveness to Improve Patient Satisfaction and Better Health Outcomes*, 2019, pp. 244–244. doi: 10.26911/the6thicph.04.06.

[14] J. Izudi, D. G. Akwang, S. I. McCoy, F. Bajunirwe, and D. T. Kadengye, "Effect of health education on birth preparedness and complication readiness on the use of maternal health services: A propensity score-matched analysis," *Midwifery*, vol. 78, pp. 78–84, Nov. 2019, doi: 10.1016/j.midw.2019.08.003.

[15] S. Kane *et al.*, "Limits and opportunities to community health worker empowerment: A multi-country comparative study," *Social Science & Medicine*, vol. 164, pp. 27–34, Sep. 2016, doi: 10.1016/j.socscimed.2016.07.019.

[16] S. Kelkar and M. Mahapatro, "Community health worker: A tool for community empowerment," *Health and Population: Perspectives and Issues*, vol. 37, no. 1–2, pp. 57–65, 2014.

[17] C. Lumsden, H. Andrews, C.-S. Leu, and B. Edelstein, "Changes in knowledge and beliefs of community health workers following an oral health intervention training program," *Journal of Prevention & Intervention in the Community*, vol. 47, no. 1, pp. 54–65, Jan. 2019, doi: 10.1080/10852352.2018.1547309.

[18] A. Plowright, C. Taylor, D. Davies, J. Sartori, G. L. Hundt, and R. J. Lilford, "Formative evaluation of a training intervention for community health workers in South Africa: A before and after study," *Plos One*, vol. 13, no. 9, p. e0202817, Sep. 2018, doi: 10.1371/journal.pone.0202817.

[19] O. A. Daniel, T. A. Akingbade, M. N. A. Azman, and J. K. R. Maay, "Implementation strategy of primary health care in Ovia communities," *International Journal of Public Health Science (IJPHS)*, vol. 10, no. 3, pp. 508-514, Sep. 2021, doi: 10.11591/ijphs.v10i3.20853.

[20] S. Ariff *et al.*, "Evaluation of health workforce competence in maternal and neonatal issues in public health sector of Pakistan: an Assessment of their training needs," *BMC Health Services Research*, vol. 10, no. 1, p. 319, Dec. 2010, doi: 10.1186/1472-6963-10-319.

[21] ILO, *International Standard Classification of Occupations 2008 (ISCO-08)*. 2012. [Online]. Available: https://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_172572/lang--en/index.htm

[22] B. Gilmore and E. McAuliffe, "Effectiveness of community health workers delivering preventive interventions for maternal and child health in low- and middle-income countries: a systematic review," *BMC Public Health*, vol. 13, no. 1, p. 847, Dec. 2013, doi: 10.1186/1471-2458-13-847.

[23] M. Dynes *et al.*, "Strengthening maternal and newborn health in rural Ethiopia: Early results from frontline health worker community maternal and newborn health training," *Midwifery*, vol. 29, no. 3, pp. 251–259, Mar. 2013, doi: 10.1016/j.midw.2012.01.006.

[24] A. B. Comfort, R. C. Juras, S. E. K. Bradley, J. Ranjalahy Rasolofomanana, A. Noeliarivelo Ranjalahy, and C. C. Harper, "Do home pregnancy tests bring women to community health workers for antenatal care counselling? A randomized controlled trial in

Madagascar," *Health Policy and Planning*, vol. 34, no. 8, pp. 566–573, Oct. 2019, doi: 10.1093/heapol/czz080.
[25] World Health Organization, *Strengthening the capacity of community health workers to deliver care for sexual, reproductive, maternal, newborn, child and adolescent health*. Geneva: World Health Organization, 2015. [Online]. Available: https://apps.who.int/iris/bitstream/handle/10665/174112/WHO_FWC_MCA_15.04_eng.pdf?sequence=1&isAllowed=y
[26] S. Javanparast, F. Baum, R. Labonte, D. Sanders, Z. Rajabi, and G. Heidari, "The experience of community health workers training in Iran: a qualitative study," *BMC Health Services Research*, vol. 12, no. 1, p. 291, Dec. 2012, doi: 10.1186/1472-6963-12-291.
[27] J. T. Fullerton, A. Ghérissi, P. G. Johnson, and J. B. Thompson, "Competence and Competency: Core Concepts for International Midwifery Practice," *International Journal of Childbirth*, vol. 1, no. 1, pp. 4–12, Jan. 2011, doi: 10.1891/2156-5287.1.1.4.
[28] D. Sánchez *et al.*, "The Potential in Preparing Community Health Workers to Address Hearing Loss," *Journal of the American Academy of Audiology*, vol. 28, no. 06, pp. 562–574, Jun. 2017, doi: 10.3766/jaaa.16045.
[29] World Health Organization, *Module 4 Competencies for midwifery practice*. Department of Making Pregnancy Safer Family, Women's and Children's Health, 2011. [Online]. Available: www.who.int/making_pregnancy_safer
[30] H. B. Perry, R. Zulliger, and M. M. Rogers, "Community Health Workers in Low-, Middle-, and High-Income Countries: An Overview of Their History, Recent Evolution, and Current Effectiveness," *Annual Review of Public Health*, vol. 35, no. 1, pp. 399–421, Mar. 2014, doi: 10.1146/annurev-publhealth-032013-182354.
[31] World Health Organization, *Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers*. Geneva: Evidence and Information for Policy, Department of Human Resources for Health, 2007.
[32] M. Sheth and M. Obrah, "Diarrhea prevention through food safety education," *The Indian Journal of Pediatrics*, vol. 71, no. 10, pp. 879–882, Oct. 2004, doi: 10.1007/BF02830824.
[33] T. H. Hadiyanta, W. Istiono, and I. D. P. Pramantara, "Impact of Training by Family Doctor on Cadre Performance in Counseling at Posbindu Dusun Tahunan of Gunungkidul Regency," *Review of Primary Care Practice and Education (Kajian Praktik dan Pendidikan Layanan Primer)*, vol. 1, no. 2, p. 31, Mar. 2018, doi: 10.22146/rpcpe.33884.
[34] S. Javanparast, A. Windle, T. Freeman, and F. Baum, "Community Health Worker Programs to Improve Healthcare Access and Equity: Are They Only Relevant to Low- and Middle-Income Countries?," *International Journal of Health Policy and Management*, vol. 7, no. 10, pp. 943–954, Jul. 2018, doi: 10.15171/ijhpm.2018.53.
[35] M. Sharma and J. A. Romas, *Theoretical Foundations of Health Education and Health Promotion, 2nd editio*. Jones & Bartlett Learning, 2010.
[36] M. Abbey, L. K. Bartholomew, M. A. Chinbuah, M. Gyapong, J. O. Gyapong, and B. van den Borne, "Development of a theory and evidence-based program to promote community treatment of fevers in children under five in a rural district in Southern Ghana: An intervention mapping approach," *BMC Public Health*, vol. 17, no. 1, p. 120, Dec. 2017, doi: 10.1186/s12889-016-3957-1.
[37] World Health Organization, *Health education: theoretical concepts, effective strategies and core competencies.* . Cairo: WHO Regional Office for the Eastern Mediterranean, 2012. Accessed: Jan. 11, 2023. [Online]. Available: https://apps.who.int/iris/bitstream/handle/10665/119953/EMRPUB_2012_EN_1362.pdf?sequence=1&isAllowed=y
[38] H. Adnani, A. Subiyanto, D. Hanim, and E. S. Sulaeman, "Perception Factors, Intentions and Attitudes with Market Community Participation to Prevent Occupational Diseases," *International Journal of Public Health Science (IJPHS)*, vol. 7, no. 1, p. 39, Mar. 2018, doi: 10.11591/ijphs.v7i1.9175.
[39] J. Malakouti, N. Alidoost, H. Mohaddesi, N. Sattarzadeh Jahdi, M. Asghari Jafarabadi, and H. Salehi Pourmehr, "The evaluating effect of education on knowledge and attitude of nulliparous women toward the delivery method [Farsi]," *Journal of Urmia Nursing & Midwifery Faculty*, vol. 12, no. 7, pp. 568–575, 2014.
[40] M. J. Ruiz, M. G. van Dijk, K. Berdichevsky, A. Munguía, C. Burks, and S. G. García, "Barriers to the use of maternity waiting homes in indigenous regions of Guatemala: a study of users' and community members' perceptions," *Culture, Health & Sexuality*, vol. 15, no. 2, pp. 205–218, Feb. 2013, doi: 10.1080/13691058.2012.751128.
[41] D. Przybylska, A. Borzęcki, B. Drop, P. Przybylski, and K. Drop, "Health Education as an Important Tool in the Healthcare System," *Polish Journal of Public Health*, vol. 124, no. 3, pp. 145–147, Dec. 2014, doi: 10.2478/pjph-2014-0032.
[42] L. R. Fabrigar, R. E. Petty, S. M. Smith, and S. L. Crites, "Understanding knowledge effects on attitude-behavior consistency: The role of relevance, complexity, and amount of knowledge," *Journal of Personality and Social Psychology*, vol. 90, no. 4, pp. 556–577, 2006, doi: 10.1037/0022-3514.90.4.556.
[43] R. M. Chawla, P. Mitra, S. H. Shetiya, D. R. Agarwal, D. S. Narayana, and N. A. Bomble, "Knowledge, Attitude, and Practice of Pregnant Women regarding Oral Health Status and Treatment Needs following Oral Health Education in Pune District of Maharashtra: A Longitudinal Hospital-based Study," *The Journal of Contemporary Dental Practice*, vol. 18, no. 5, pp. 371–377, May 2017, doi: 10.5005/jp-journals-10024-2049.

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