

Paternal Involvement in Maternal Healthcare: A Systematic Review of *Suami* SIAGA in Rural Indonesia

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ABSTRACT

Introduction – Maternal health has remained as a nationwide concern especially due to Indonesia's staggeringly high maternal mortality rate. Community development and promotion on prenatal and antenatal care has been implemented locally especially in rural areas with limited exposure to proper maternal education. Despite that, paternal understanding and involvement in maternal healthcare is a contributing factor that is commonly overlooked. *Suami* SIAGA is a campaign that has previously been enforced in Indonesia to promote paternal involvement pre- and post-birth with the hopes of instilling paternal responsibility and care for their partners for a better maternal outcome.

Purpose – To analyse the effectiveness of the *Suami* SIAGA campaign in rural Indonesia as a campaign aiming to increase paternal involvement in community maternal healthcare

Methodology – Literature search was conducted according to the PRISMA guidelines on international and national databases with additional materials from local university repositories until November 2020. A total of 600 studies were found with only cross-sectional studies being included. Critical appraisal of included studies was performed using the Newcastle-Ottawa Scale for quality assessment

Findings – 4 peer reviewed cross-sectional studies were included in this review with a total of 55.139 couples intervened. The articles showed a positive association between the SIAGA status of husbands and improved participation in maternal healthcare especially in antenatal care visits, routine pregnancy checks and overall involvement in partners' routines.

Value – This review is the first in analysing the *Suami* SIAGA campaign and has valuable information in contributing to Sustainable Developmental Goals 3.7 on sexual and reproductive health

Keywords: antenatal care, paternal, Indonesia, maternal health services, rural population

INTRODUCTION

Maternal health remains as one of the biggest and most persistent public health problems in the world. Every day, 810 pregnant females die from preventable causes and in 2017, more than 295,000 deaths occurred in such fashion. Almost all deaths are contributed from low and lower-income countries. Although a significant improvement has been observed during the last 2 decades, the death count remains intolerable (WHO, 2019). Indonesia, though declared as an upper-middle income country, still faces this problem today. With 117 per 100.000 live births, Indonesia's Maternal Mortality Rate (MMR) is still relatively high compared to other upper-middle income countries around Southeast Asia (The World Bank, 2017). Studies have shown these unnecessary deaths can be effectively

prevented with adequate antenatal care (ANC) (Wondemagegn, Alebel, Tesema, & Abie, 2018).

ANC is a specialized healthcare system for pregnant women. It consists of 6 different aspects, namely health system interventions, nutrition interventions, maternal and fetal assessments, preventive measures, and common pregnancy symptom interventions. All these aspects are divided into eight visits throughout pregnancy trimesters (WHO, 2018). Despite its noble mission, the parity of this program's utilization is clear. Maternal deaths in Indonesia predominantly comprises deaths in rural areas and coincidentally, the frequency of antenatal visits in rural areas in Indonesia compared to those who live in urban areas is lower by 10% (UNICEF, 2016). Factors that contribute to this parity include maternal age, education, socioeconomic status, history of pregnancy-related complications, spouse or partner support, quality of care, and distance to the nearest ANC centre (Ali, Dero, Ali, & Ali, 2018).

One of the most important factors in increasing the frequency of ANC visits is the involvement of the partner. Studies have shown that male company in ANC improves overall maternal outcome in ANC (Suandi, Williams, & Bhattacharya, 2019). Therefore, it is possible the aforementioned shortage of antenatal visits is caused not only because of infrastructure inequality but also because of a deficiency in husband knowledge and attention.

Hence, in an attempt to increase the knowledge and involvement of husbands during pregnancy, the Ministry of Health of Indonesia put campaigns in motion. These efforts started back in 1996 with the Mother-Friendly Movement or Gerakan Sayang Ibu. (Sood, Chandra, Palmer, & Molyneux, 2004). This campaign evolved into *Suami* SIAGA (abbreviation for Siap, Jaga, Antar or Ready, Watch, Drive) or directly translated to Alert Husband (Karlina, 2018). This campaign, along with its missions, suggest that the government acknowledge the impact of conditioning the social environment surrounding the mothers, hence a commitment to not only improve communication between healthcare workers, but their interaction with patients' relatives. However, until now, there is no review that assesses the effect of said campaign toward husband knowledge and overall maternal health. For that very reason, this systematic review was conducted in hopes of being the very first to assess the overall effectiveness of this campaign and its impact on overall maternal health.

METHOD

SEARCH STRATEGY

The systematic review is conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-

Analyses (PRISMA) statement. Initially, we conducted searches on various international databases such as MEDLINE, Cochrane, and ProQuest for relevant journal articles up until November 2020. However, due to very limited results we decided to extend our research on established local databases such as Garuda Dikti, Media Neliti, and Google Scholar. Furthermore, a more extensive search was done on multiple local universities' databases; namely the University of Indonesia e-Library, Airlangga University repository, and the repository of Gajah Mada university. Articles mentioning the *Suami* SIAGA Campaign and its effectiveness towards the husband's role in maternal health were included. Both subject heading and text word searches were utilised and different search terms were implemented for each database. No language restrictions were applied, however the studies included in the review were restricted to Bahasa Indonesia and English; which were the only languages readable by the authors. The search yielded a total of four studies that were selected based on relevancy and eligibility. Table 1 summarizes the search term used and Figure 1 shows the overview of the study selection process using the PRISMA flowchart.

Table 1. Search Terms Used for the Included Databases

Database	Search Terms
Google Scholar	("suami siaga" OR "involving husbands" OR "alert husbands") AND ("kehamilan" OR "antenatal care" OR "maternal health" OR "kesehatan maternal")
Pubmed, Cochrane, Proquest, Universitas Indonesia e-Library	("suami siaga") AND ("maternal health" OR "kesehatan maternal") OR ("effect*")
Universitas Airlangga Repository	("suami siaga") AND ("maternal health" OR "kesehatan maternitas")
Garuda Dikti, Media Neliti, Gajah Mada Repository	("suami siaga")

INCLUSION & EXCLUSION CRITERIA

The inclusion and exclusion criteria were developed based on our initial searches. The inclusion criteria set were: (1) Study design being observational, (2) Intervention being in the form of the *Suami* SIAGA campaign, (3) Output in better understanding of maternal healthcare by the husbands which were elaborated more into number of antenatal care visits, birth preparedness, and overall behaviour towards pregnancy. The authors decided to still include confounding variables such as: education level, occupation, and work hours for a more comprehensive socio-demographic analysis. On the other hand, the exclusion criteria implemented were: (1) studies with irretrievable full text, (2) non-original research articles such as reviews, conferences abstracts or proceedings, advertorials, magazine articles, and letter to the editors, (3) pilot studies, (4) studies in languages other than Bahasa Indonesia or English.

DATA EXTRACTION

Two reviewers (MMAZA & SFM) did data extraction with any differences further resolved via consensus from a third author (IRW). From the 4 included studies, that data extracted include: (1) author and publication year, (2) study design, (3) study location, (4) sample size, (5) subject

characteristics, (6) indicator for measurement, (7) and outcome in the format stated above.

CRITICAL APPRAISAL

The risk of bias assessment was conducted using the modified version of the Newcastle-Ottawa Scale (Modified NOS) particularly made to evaluate bias arising from cross-sectional studies. Each study was evaluated based on three categories: (1) Selection, (2) Comparability, (3) Outcome. All the three criteria were further divided into sub-criteria as shown in Table 3 with each of them amounting to 5,3 and 3 points respectively. The cumulative points were then converted into Agency for Healthcare Research and Quality (AHRQ) with thresholds include Good, Fair, and Poor quality. Assessment of bias was conducted by two independent reviewers (MMAZA & MAN) with any conflicting results discussed hereafter to achieve consensus.

RESULT AND DISCUSSION

SEARCH RESULTS

After exploring international, national, and university databases as well as conducting individual searches we acquired a total of 600 studies using the search terms used in respective databases. 567 studies were excluded based on its title relevance, and 16 studies were excluded based on duplicate titles. Furthermore, 8 studies are assessed for eligibility. However, 4 studies cannot be included due to the fact that the inappropriate study design. After analysing the studies based on its relevancy and eligibility, a total of 4 studies are included in this systematic review.

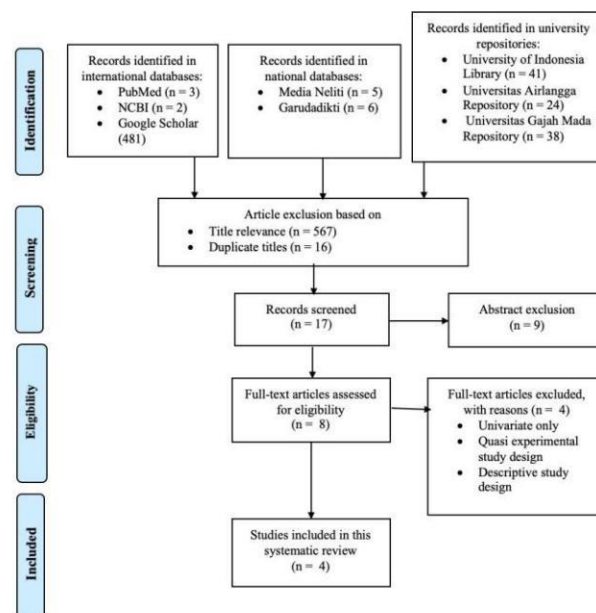


Figure 1. Overview of Study Selection Process

CHARACTERISTICS OF INCLUDED STUDIES

In order to maintain uniformity, four cross-sectional studies were reviewed. The studies included were all conducted in Indonesia, published between 2010 until 2020. This review involves a sum of 55,139 study participants, primarily relying on primary data obtained from a questionnaire that classifies the husband's alertness into SIAGA and non-SIAGA husbands. The summary of the characteristics and results of the studies is provided in Table 2. In terms of outcomes, all of the studies included in this review show a positive association between the husband's alertness towards maternal health.

From Table 3, critical appraisal yielded mixed results of quality. Studies conducted by Puspita, Widodo, & Mulyasari (2013) and Kurniati, Chen, Efendi, Ku, & Berliana were considered good, while studies conducted by Fazdria, Emilda, & Sukamdewi (2015) and Rakhmawati & Indawati (2013) were classified as Fair and Poor respectively.

husband", with SIAGA being an abbreviation of three Indonesian words, "*Siap*", "*Antar*", and "*Jaga*". "*Siap*" means to be alert, which is described as taking immediate action when confronting a danger sign, and accompanying or finding company for one's wife for four recommended antenatal care visits. "*Antar*" means to prepare transportation and potential blood donors. "*Jaga*" means to "guard," which is described as always being with your wife during and after delivery.

Table 2. Summary of Study Characteristics

Study Details						Outcomes			Commentaries
Author	Study Design	Location	Sample Size	Subjects Characteristics	Measurement Instruments	Variables measured	Value	p value (SUAMI SIAGA Association)	
Fazdria; 2014	Cross-sectional	Langsa city, Indonesia	43	Husbands whose wives delivered the babies at Langsa Hospital	Questionnaire and interview	SUAMI SIAGA prevalence	14 (32.5%)	NA	SUAMI SIAGA status is positively correlated with better knowledge, behavior, and education but not working hours
						Knowledge*	Good (37.2%)**	0.036	
						Behavior*	Negative (72.0%)**	0.000	
						Education*	Low (79.0%)**	0.040	
						Working hours	>40 hrs/week (72.0%)**	0.160	
Kurniati; 2017	Cross-sectional	Indonesia	54,913	Married women and men	IDHS 2012 (Indonesia Demographic and Health Survey) data	SUAMI SIAGA prevalence	1086 (86.4%)	NA	Wives who are in older age group, received higher or at least secondary education tend to have SIAGA husband. Moreover, SIAGA husbands tend to live in urban area, received at least secondary education, in younger age groups, higher in wealth index, had wives that at least received secondary education, and in younger age groups. SUAMI SIAGA also more likely to show up during the delivery or ANC
						Husband Factors			
						Age	30-40 (54.8%)**	p > 0.05	
						Residence location	Urban (55.4%)**	p > 0.05	
						Education	Secondary (58.4%)**	p > 0.05	
						Wealth	Richest (21.9%)**	p > 0.05	
						Wife Factors			
						Age*	15-29 (57.1%)**	p < 0.05 OR: 41-49: 24 (1.1-5.5) p < 0.01 OR:	
						Education*	Secondary (57.3%)**	Secondary: 1.8 (1.2-2.7) Higher: 2.8 (1.4-5.6)	
						Decision-making inputs (related to wife's healthcare)	Husband and wife (52.3%)**	p > 0.05	
Puspita; 2015	Cross-sectional	Pojoksari village, Indonesia	37	Pregnant women in third trimester	Questionnaire about husband involvement & KIA (Kartu Identitas Anak or Child Identity Card)	Parity	1 (41.1%)	p > 0.05	Husband's SUAMI SIAGA status is positively correlated with ANC visit frequency adequacy. Subject sociodemographic is not represented clearly, analysis was partially carried out by narrative analysis
						SUAMI SIAGA prevalence	18 (48.6%)	NA	
						ANC visit adequacy*	Inadequate (51.3%)**	0.029	
						Education	NA*	NA	
						Behavior	NA*	NA	
Rakhmawati; 2013	Cross-sectional	Sumokali village, Indonesia	146	Fertile age couples with 1 under-one-year-old infant AND Puerperal women	Questionnaire & Institutional data	Income (Husband)	NA*	NA	Maternal outcomes appeared worse in the SIAGA group due to them being less aware than the comparator arm at the start of the study. Association analysis was carried out fully using narrative analysis thus no p value available
						SUAMI SIAGA prevalence	21 (28.8%)		
						Husband factors			
						Age	26-35 (61.6%)**	NA	
						Education	High school (38.3%)**	NA	
						Occupation	Self-employed (30%)**	NA	
						Income (monthly)	≤ Rp1.700.000,00 (67.1%)**	NA	
						Wife factors			
						Age	20-35 (56.1%)**	NA	
						Parity	> 1 (71.2%)**	NA	
						Maternal health problems	None (80%)	NA	
						Delivery problems	None (87.6%)	NA	
						Past abortion history	None (93.1%)	NA	

Legends:

* Significantly associated with SUAMI SIAGA

** Mode value is represented due to categorical/ordinal nature

Data is mentioned but not clearly stated, thus conclusion cannot be taken

FUNDAMENTALS OF *SUAMI* SIAGA CAMPAIGN

The SIAGA campaign, a part of the Maternal and Neonatal Health (MNH) program by the Ministry of Women's Empowerment, was the first campaign aimed towards increasing awareness on maternal and newborn care via the promotion of birth preparedness and complication readiness (BP/CR). "*Suami* SIAGA" translates to mean "I'm an alert

The desired response of the *Suami* SIAGA Campaign was that husbands should was that husbands should (1) encourage their wives to seek antenatal and delivery care from professionals, (2) accompany their wives during antenatal care visits and delivery, and (3) to work with community members to develop plans in case of an obstetric emergency, most prominently regarding transportation.

Media used for the the *Suami* SIAGA campaign were primarily PSA television, radio broadcasts and print materials, including brochures, stickers, and interpersonal communication materials used as facilities for service providers, as well as a variety of supplementary materials, including hats, pins, T-shirts, and mobile van broadcasts. Ninety episodes of an existing drama series entitled *Lilin-Lilin di Depan* as well as a separate new three-episode television mini-series, *Kembang untuk Nur* (“Flower for Nur”) were produced with specific messages about *Suami* SIAGA. In addition to these media activities, providers in select districts were trained in interpersonal communication skills and given cue cards to communicate to couples about delivery preparation (JHU/CCP, 2000). Additionally, a community mobilization activity dubbed SIAGA Campaign Day helped enhance campaign activities, while mini-grants were disbursed to 90 villages in nine districts in the three priority provinces (East Java, South Sulawesi, and South Sumatra), to develop a transportation system for pregnant mothers.

Table 3. Summary of Critical Appraisal using Modified NOS for Cross-Sectional Studies

Categories	No.	Quality assessment criteria	Fazdria et al; 2014	Kurniati et al; 2017	Puspita et al; 2015	Rakhmawati et al; 2013
Selection (5)	1	Representativeness of the sample	*	**	*	*
	2	Sample Size	*	*	*	*
	3	Non-Respondents	*	*	*	*
	4	Ascertainment of the exposure (risk factor): **Validated measurement tool *Non-validated measurement tool	-	**	**	*
Comparability (2)	5	The study controls for the most important factor (select one)	*	*	*	*
	6	The study control for any additional factor	-	*	*	*
Outcome (3)	7	Assessment of outcome: **Independent blind assessment **Record linkage *Self Report	*	**	*	*
	8	Statistical test	*	*	*	-
AHRQ Standard - Quality			Fair	Good	Good	Poor

An effectively conveyed SIAGA campaign has been proven to improve one's knowledge towards specific danger signs during pregnancy, childbirth, and postpartum period. A study involving 3,364 subjects demonstrated that around 53% of all of the study participants affirmed that they were aware of *Suami* SIAGA at the end of the study. The effectiveness of the SIAGA campaigns is also supported by the statement, present in the study stating that women and husbands who were exposed to the SIAGA campaign were more likely to conduct four or more ANC visits than those not exposed. This shows that effective health communication plays a role in influencing the community's awareness, particularly in increasing overall maternal health (Sood et al., 2004). Thus, to further cement these claims, a systematic study from multiple articles was conducted.

ASSOCIATION BETWEEN SIAGA HUSBANDS AND MATERNAL HEALTH

From the four articles that were in line with our inclusion criteria, some trends were identified regarding the impact of

the SIAGA status on husbands towards different aspects of maternal health. All four articles showed a positive association between the SIAGA status and improved participation in maternal health. The most notable is the improvement in husband's awareness about ANC visits and routine pregnancy checks among SIAGA husbands (Fazdria et al., 2015; Kurniati et al., 2017; Puspita et al., 2015; Rakhmawati & Indawati, 2013). In Kurniati et al. (2017), men in the SIAGA group were more likely to be present during wives ANC by a whopping 2.3 OR, and similar probabilities can be found in Rakhmawati & Indawati (2013), which states that 43% of SIAGA husbands accompany their pregnant wives, more than 1.5 times more likely than mid-SIAGA husbands (28.8%) and non SIAGA husbands (27.4%). Meanwhile, Puspita et al. (2015) suggests a positive correlation between the SIAGA status and increased frequency of ANC visits ($p = 0.029$).

Furthermore, three of four studies show that the SIAGA campaign improves husbands' involvement in the daily routines of their wives (Fazdria et al., 2015; Kurniati et al., 2017; Rakhmawati & Indawati, 2013). In Fazdria et al. (2015) 77.7% of husbands that are considered SIAGA have decent-to-good knowledge about pregnancy, which includes awareness of the huge number of risks associated with pregnancy. Also, good attitudes towards pregnancy are relatively present within all SIAGA husbands. From Kurniati et al. (2017), a high proportion of men (86%) in this study is classified as *Suami* SIAGA reflecting their willingness to involve in the birth preparedness including planning place of delivery, skilled birth attendant, delivery fund, transportation to the birth-place, and blood donation. In addition to that, men in the SIAGA group were more likely to be present during wives ANC (OR 2.3; 95% CI: 1.4 3.7). SIAGA husbands also tend to take their spouses to give birth at a health facility, although this result was not significant (OR 1.1; 95% CI: 0.8 1.6). Furthermore, Puspita et al. (2015) claims that 92.2% husbands play a pivotal role in maternal health. This is directly represented by the positive correlation between SIAGA husbands and the frequency of involvement in ANC. Finally, in Rakhmawati & Indawati (2013), the SIAGA status of husbands were further separated into three categories: SIAGA, mid-SIAGA, and non-SIAGA husbands. The survey conducted showed that 43.8% husbands which are considered SIAGA husbands played a bigger role in accompanying their pregnant wives compared to mid-SIAGA husbands (28.8%) and non-SIAGA husbands (27.4%).

IMPORTANCE OF SIAGA HUSBANDS INVOLVEMENT IN MATERNAL HEALTH

The husband's knowledge and awareness are a factor to be reckoned in maternal health and outcome. In the study conducted by Kurniati, et al. (2017) it was shown that the SIAGA status of the husbands was a significant predictor of ANC visits. Such result happens to be present in the study conducted by Puspita, et al. (2015) further signify these findings. Paternal involvement is said to be associated with maternal psychosocial stress, prenatal care behaviors, and substance use (Bond, 2010). All of the factors related to the associations were found in all four studies gathered, further validating the importance of paternal involvement in Indonesia. Also, the effect of paternal involvement is found at the community level.

Based on a review that assess the effectiveness of health campaign interventions and its direct correlation towards ANC visits, two studies conducted in Nepal involving primary health programs in the form of facility-based couples' education as well as community-based education in Pakistan have shown that there is no change in ANC visits after the respective interventions. In contrast, six out of the eight studies compared in the review demonstrated a substantial increase of ANC visits when multi-component interventions with male involvement were conducted. Thus, it could be inferred that a direct involvement of husbands plays a huge role in the quality of ANC. The review also stated the fact that there is no further change in the frequency of ANC visits if the intervention stopped; further proving that a multi-component intervention, directly involving the family member, such as *Suami SIAGA*, is effective (Tokhi et al., 2018).

EXTERNAL AND INTERNAL FACTORS INFLUENCING SIAGA HUSBANDS

Moreover, certain factors were also identified which were associated with the SIAGA status of husbands. In all the studies, education status remained a prevalent factor which was correlated with the SIAGA status of husbands (Fazdria et al., 2015; Kurniati et al., 2017; Puspita et al., 2015; Rakhmawati & Indawati, 2013). Educational status was further elaborated; touching on previous formal education and general knowledge about pregnancy (Fazdria et al., 2015). A positive correlation was shown between well-educated husbands with their SIAGA status (Fazdria et al., 2015; Kurniati et al., 2017; Puspita et al., 2015; Rakhmawati & Indawati, 2013). This claim is further supported by a separate study conducted by Jungari & Paswan (2019) which analysed the association between husband's knowledge of general pregnancy and maternal health. Within this cross-sectional study, husband's education levels were significantly associated with an increase in wife's utilization of ANC care services (OR: 2.64; 95% CI: 0.847 8.24) (Jungari & Paswan, 2013).

REVITALISATION AND APPLICABILITY OF THE CAMPAIGN TODAY

Other than education, Rakhmawati & Indawati (2013) showed that the majority of non SIAGA husbands were associated with being in the age range of 26-35 and a relatively lower income (<Rp1.700.000,00). Furthermore, Kurniati et al. (2017) stated multiple other variables that may influence the SIAGA status. Several variables that may affect a husband in becoming SIAGA include: husband factors (age, place of residence, education, wealth index), wife factors (age, education), women empowerment factors (involvement of women in decision-making about their own health care), child-wish factors (whether husbands wish to have another child within two years or after more than two years or are undecided) and parity (number of children ever born). Interestingly, only variables that involve wife participation were significant in this study compared to the other confounding variables (Kurniati et al., 2017).

Similar to the *Suami SIAGA* Campaign, Gerakan Sayang Ibu is also one of governmental efforts to improve the quality of life of pregnant women in hopes of reducing mortality rates among mothers due to childbirth, postpartum, as well as pregnancy itself. This program aims to spread awareness to the family and society on how to

create a hospitable and responsive environment that is able to prevent and overcome various problems faced by these women. In this movement, a series of efforts including community organizations and promotion through social media. Similar to the *Suami SIAGA* Campaign, issues that are taken into account revolve around increasing awareness regarding women's quality of life, exclusive breastfeeding, prevention of maternal death, as well as the female reproductive system. In addition to that, the availability of ambulances and facilities for antenatal care is also supported by this campaign. This campaign yielded a positive result, as shown through the increase in antenatal visits by pregnant women, specifically in the first and fourth trimester (Masrizal, 2016).

The Indonesian government has classified the COVID-19 pandemic as a non-natural disaster, stated through the Presidential Decree of the Republic of Indonesia No. 12 in the year 2020. Thus, steps to prevent and control of COVID-19 infection is a priority, especially to vulnerable groups, one of which are pregnant women. During the pandemic, pregnant women are prone to stress, which in turn could reduce their immune system, further making these women more vulnerable towards the COVID-19 virus infection (Aritonang et al., 2020)

A study conducted in Serang, North Sumatra aims to analyze the effectiveness of a public health campaign towards pregnant women in order to reduce such stress by raising their awareness of the COVID-19 pandemic itself. After conducting interviews with the local pregnant women, factors that exacerbate stress to them is the concern that the virus could be transmitted to their newborn. In contrast, these women tend to come to health facilities without masks, refusing to follow health protocols. Interventions done in this study includes a community outreach program in the local health facility where volunteers campaign on the importance of COVID-19 prevention to these women during antenatal visits. The study also advised that these interventions should also involve a larger scope of people living with these pregnant women, including husbands, children, as well as family members. From this study we could infer that during the pandemic, paternal involvement during maternity is more focused towards keeping these women away from the virus (Aritonang et al., 2020)

STRENGTH AND LIMITATION

The strengths and weaknesses of the studies included in this systematic review have been taken to consideration. The strength of the selected studies lies in the fact that All of the studies included demonstrated clarity in sampling, with appropriate data and sample size representation. Moreover, almost all of the studies conducted the chi square test to analyze the data obtained. One study qualitatively analyzed the data using cross tabulation, instead using chi square test to conduct the bivariate analysis (Rakhmawati & Indawati, 2013). A solid and clear recommendation is offered at the end of each study. Finally, all four studies have shown low risk of bias based on the NIH quality assessment. Nevertheless, there are several limitations in these studies, one study, conducted by Rakhmawati & Indawati (2013) pointed out survivorship bias without further validation. Some of the studies might include authors own interpretations and assumptions in discussions. Although the sample sizes are variable, there are more small sample

sized studies than the relatively big one. One study also is sourced from secondary data that might limit the variables studied (Kurniati et al., 2017).

The strength of this review lies on the uniformity of the study design across the four studies. This homogeneity made it possible for easy comparison between the dependent and confounding variables. Thus, helping in the analysing process and resulting in a justified and accountable conclusion being drawn from the four studies. Moreover, the qualitative outcomes of similar variables and its correlation with the main independent variable (SIAGA status) across the four studies are intersecting with one another, hence making the outcomes more easily comparable. Looking into the sample characteristic of the studies, the majority are centralized in the rural regions of Indonesia. This could be a strength of this review if the analysis is used for future interventions that target the similar demographic. Most importantly, from our prior research across multiple databases, there has not been an identical or similar review analysing the association between the SIAGA campaign and its impact on maternal health.

However, a difference in result presentation of the studies may limit the qualitative analysis of the review. Only two studies expressed p values and OR while one only mentioned p values and the other solely compared percentages using a tabulation table. Nonetheless, this setback can be compensated by the high OR and significant results obtained individually from the results. Another limitation would be that only one study bridged the confounding variables with the SIAGA campaign and how it was related to maternal health. However, the relation between the confounding variables and maternal health can still be justified by referencing a previous study which has proven a significant positive correlation with an OR of >1.

CONCLUSION AND RECOMMENDATION

The *Suami* SIAGA campaign initiative is positively beneficial to maternal health. It is a prime example of communication media with consequential impact on healthcare and sets a precedent for all following health promotion campaigns. However, the enforcement of this campaign is still narrow in scope, as reflected by the low prevalence of SIAGA status among husbands and the disparity of this status among different regions. This is especially significant in Indonesia, where the Maternal Mortality Rate is still relatively high, parity of antenatal care is prevailing, and husband involvement in maternal care is lacking. Therefore, the urgency for a widespread campaign is clearly needed to alleviate the national burden. *Suami* SIAGA effectively increases awareness and involvement of males in maternal healthcare, as most evident in the rise of antenatal care sessions when husbands participate, better encouragement and attitude of their wives, and improved facilities during the pregnancy, childbirth, and postpartum period. It has great potential to transform the attitude and contributions of males in healthcare as well as promote the implementation of communication on a nationwide basis.

It is recommended that the *Suami* SIAGA campaign is implemented again in the future, but on a larger scale, and involving populations with less access such as lower income areas. Furthermore, the campaign could be widely

disseminated through more varying forms of media. With the rapid advancement of health technology, digital mediums could be incorporated beyond television, radio, and mass media events. Even so, currently popular methods used to spread health information must be maintained or revitalized, and health workers who work closely with the community should also actively promote the campaign message.

It is also important to recognize that a concerted effort from different parties is required for the sustainability of an impactful campaign. The party with the highest level of responsibility is the government, which has the most access to implementation of this campaign in institutions around the country. It is highly recommended for their interventions to emphasize further the importance of maternal and paternal contributions in antenatal care, and on a broader scale, educate husbands regarding their roles and responsibilities as the head of the household in Indonesia's patriarchal community.

Further research would be beneficial in better and wider utilization of *Suami* SIAGA. More variables affected by and affecting the SIAGA status may be explored, such as the use of postpartum family planning, the impact of domestic behaviour regarding respect and abuse during pregnancy, and the cost-efficiency of the campaign. Additionally, more interventional or experimental research should be conducted in regions that are still lacking in maternal health education.

CONFLICT OF INTEREST

The authors declare no conflict of interest

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AUTHOR CONTRIBUTION

According to the Contributor Roles Taxonomy (CRediT) author statement: MMAZA was responsible for Conceptualization, Methodology, Writing - Original Draft, Visualization, Project administration. IRW, SFM, & MAN was responsible for Writing-Original Draft, Investigation, Visualization.

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