

EVALUATION OF IRON SUPPLEMENTATION PROGRAM FOR PREGNANT WOMEN IN GUNUNGGKIDUL, INDONESIA, 2015

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Abstract: Iron supplementation program aims to prevent anemia during pregnancy. Anemia among pregnant women is a risk of miscarriage, premature birth, low birth weight (LBW) and postpartum hemorrhage. The anemia prevalence in Gunungkidul increased from 14.97% in 2014 to 21.88% in 2015. This study aimed to evaluate iron supplementation program for pregnant women in Gunungkidul in 2015. This was a descriptive study involving staff from 30 Public Health Centers (PHC) and Gunungkidul District Health Office (DHO). Data on program resources, planning, implementation and monitoring evaluation were collected using structured questionnaires and checklist sheets. Data on program coverage and anemia prevalence were taken from DHO's reports. There was 62 staff (midwives and nutritionist) working in the program. The number of the estimated pregnant women and iron supplementation needed were calculated at DHO level. Iron supplementation administration was conducted at PHC level, involving midwives, nutritionists, and pharmacists. Iron supplementation coverage was 88.77%, however, the prevalence of anemia was high (21.88%). Furthermore, most midwives and nutritionist could not ascertain whether the administered iron supplementation was actually consumed by pregnant women. Iron supplementation program in Gunungkidul District needs to put efforts to ascertain treatment adherence.

Keywords: Program Evaluation, Iron Supplementation, Anemia, Pregnant Women

Introduction

Anemia is a global public health problem affects one-quarter of the world's population and is concentrated in preschool-aged children and women. Data from World Health Organization of Vitamin and Mineral Nutrition Information System 1993–2005 estimated 42% of pregnant women with anemia worldwide and caused 115,000 maternal deaths per year globally (McLean *et al.* 2009). In Asia, anemia is the second-highest cause of maternal mortality (Sanghvi *et al.* 2010). Anemia among pregnant women is still one of public health problem particularly in developing countries and anemia is still the main nutritional problem during pregnancy in Indonesia that mostly caused by iron deficiency (Ministry of Health of Indonesia, 2015).

Anemia in pregnancy is defined as hemoglobin levels of < 11 g/dl and caused by several conditions such as iron, folate acid, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections, and inherited disorders (World Health Organization [WHO] 2011). Anemia is the risk of miscarriage, premature birth, low birth weight (LBW) in pregnant women, as well as bleeding before, during and after childbirth (postpartum hemorrhage), which may lead to increase the risk of maternal and infant mortality. Anemia during pregnancy will also increase the risk of stunting in children (Zeng *et al.* 2008). Susanti, 2016). A prior

study also showed that maternal anemia will increase the risk of non-communicable diseases when the child grows up and the risk of LBW in the next generation (Kalaivani, 2009).

Iron supplementation program as a public health intervention in Indonesia has been implemented since the early 1990s as one of the efforts to address the problem of anemia during pregnancy. This is a top-down program funded by government (Ministry of Health of Indonesia, 2015). The prevalence rate of anemia during pregnancy had decreased from 50.9% in 1995 to 40% in 2001 and this was assumed as the impact of the iron supplementation program among pregnant woman in Indonesia (Atmarita, 2005). Previous studies in Indonesia also showed a significant relationship between iron tablet consumption and anemia during pregnancy (Suega, 2002; Nora, 2008; Kusumaningrum, 2010).

Anemia among pregnant women is considered as the health priority in Gunungkidul District. Anemia during pregnancy in this area increased slightly from 2013 to 2014 (14.51% to 14.97%) and then increased significantly to 21.88% in 2015. These figures exceeded were higher than the target of Gunungkidul Medium Term Development Plan in 2015 (10.5%) (Isfandyari & Langi, 2016).

This study aimed to evaluate the iron supplementation program for pregnant women in Gunungkidul District in 2015. Findings from this study will assist program manager to identify implementation bottle necks and to improve the program.

Method

This was a descriptive study which conducted from May until July 2016. This study involved Gunungkidul DHO and 30 PHCs. Study participants were 62 people. They were two programmers from Maternal and Child Health (MCH) Departement and Nutrition Departement of Gunungkidul DHO and 60 PHC officers which consisted of 30 midwives and 30 nutritionists. Data on program resources, planning, implementation and monitoring evaluation were collected using structured questionnaires and checklist sheets. Data on program coverage and anemia prevalence were taken from DHO's reports, particularly MCH & nutrition data of Gunungkidul DHO in 2015. Evaluation variables were input, process, output, and outcome. Input variable was evaluated from human resources and supporting resources. Process variable was evaluated from planning, development, implementation, until monitoring and evaluation of the program. Output variable was assessed from the coverage of iron supplementation for pregnant women in Gunungkidul in 2015 and outcome variable was assessed by the prevalence rate of anemia among pregnant women in Gunungkidul 2015. The program was evaluated by comparing all variables to the guidelines and targets.

Result

Input

Iron supplementation program in Gunungkidul consisted of 62 staff. The staff characteristics are shown in Table 1. The average of staff age was 43 years old. Most staff were the senior (41-50 years old), female (83.87%), midwives (53.22%) who worked in the average of 12,8 years.

Table 1. Characteristics of Human Resources Related Iron Supplementation Program for Pregnant Women in Gunungkidul District, Indonesia, 2015.

Human resources	Total (n=62)	
	n	%
Age (Average ± SD) 43,42 years (±8,18 years)		
Age group		
21-30 years	6	9.68
31-40 years	15	24.19

41-50 years	28	45.16
≥ 51 years	13	20.97
Sex		
Male	10	16.13
Female	52	83.87
Education level		
D3 Midwifery	32	51.61
D3 Nutritionist	22	35.48
D4 Midwifery	1	1.61
D4 Nutritionist	1	1.61
Bachelor of Public Health	3	4.84
Bachelor of Nutrition	2	3.23
Bachelor (Non-health)	1	1.61
Profession		
Midwives	33	53.22
Nutritionist	25	40.33
Public Health Officer	3	4.84
Other	1	1.61
Length of work (Average ± SD) 12.8 years (±9.1 years)		

Table 2. Supporting Resources of Iron Supplementation Program among Pregnant Women in All Public Health Center in Gunungkidul, Indonesia, 2015

Supporting facilities	Total (n=30)	
	n	%
Guideline book	15	50
Maternal and Child Health (MCH) book	30	100
Minimum Service Standard (MSS) book	25	83.33
MCH-4 sheet (Cohort antenatal care' sheet)	30	100
MCH-10 sheet (Antenatal care registration' sheet)	27	90
Monthly report sheet	21	70
Transportation mean	27	90
Storage for iron supplementation	30	100
Telephone	30	100
Leaflet/pamphlet/brochure related program	38	93.33
Computer/laptop	20	66.67
Public Health Sub-center	30	100
Village Health Center (Poskesdes)	17	56.67
Integrated service post (Posyandu) in Indonesia	30	100

Table 2 shows supporting resources of the program. Half of all PHCs had guideline book (50%), all PHCs had facilities for recording and reporting such as MCH book for pregnant women (100%), cohort antenatal

care' sheet (100%), and most of PHCS had MSS book (88.33%), antenatal care registration' sheet (90%) and monthly report' sheet (70%). Most of the PHCs also had transportation mean (90%), education media related program such as leaflet/pamphlet or brochure (93.33%) and computer/laptop (66.67%), and all PHCs had storage for iron tablets (100%) and telephone (100%). All PHCs had Public Health Sub-center (100%) and Intragated Service Post (100%) as the places to distribute the iron tablets to pregnant women and more than half of PHCs had Village Health Center (56.67).

Process

Iron supplementation program among pregnant women is a top-down program from Ministry of Health of Indonesia. In early 2015, Gunungkidul DHO calculated the approximate amount of iron tablets needed by pregnant women during 2015. The result of this calculation was sent to Yogyakarta Province Health Office. According to their program planning, DHO was required to provide approximately 900,000 iron tablets. However, they only managed to procure approximately 650,000 iron tablets (450,000 iron tablets from the national budget and 200,000 from the local budget). Therefore, there was iron tablet stock out at the end of 2015. This was due to iron tablet stock out from the national level.

In the implementation of the program, most pregnant women obtained 30 iron tablets in the second trimester of pregnancy (43.33%) and obtained 90 iron tablets in the third trimester of pregnancy (86.66%). Midwives always checked the levels of hemoglobin (Hb) of pregnant women before the iron tablets given (93.33%) and after the total 90 iron tablets given (90%). Program implementation required the collaboration of midwives, nutritionists, and pharmacists. All midwives (100%) and most nutritionist (90%) in PHCs also gave counseling to pregnant women after giving the iron tablets. Furthermore, midwives made a record number of iron tablets given to pregnant women in MCH handbook, cohort antenatal care' sheet, and antenatal care registration' sheet.

Monitoring and evaluation of this program were integrated with other nutrition programs. Forms of monitoring were carried out during supervision to PHC to check stock iron tablets remaining and for monitoring the coverage of iron supplementation during the data validation activities. Supervisions conducted in five PHCs and data validation was performed four times during 2015.

Some respondents (38,71%) stated that there were obstacles of iron supplementation program in pregnant woman 2015. The main obstacle was non-adherence of iron tablets consumption because the taste is bitter or fishy. It also caused nausea and vomiting. Most respondents were difficult to ensure whether the iron tablets actually consumed by pregnant women or not.

Output and outcome

The output was the coverage of iron supplementation and the outcome was the prevalence rate of anemia among pregnant women in Gunungkidul in 2015. The coverage of iron supplementation for 30 tablets and total 90 tablets to pregnant women in all PHCs in Gunungkidul in 2015 can be seen in table 3.

Table 3. Coverage of Iron Supplementation Program among Pregnant Women in All Public Health Center in Gunungkidul, Indonesia, 2015

Public health center	Pregnant women	Pregnant women with iron supplementation			
		30 tablets		90 tablets	
		n	%	n	%
Panggung II	191	191	100	171	89.53
Panggung I	138	138	100	116	84.06
Purwosari	299	299	100	251	83.95
Paliyan	379	313	82.59	298	78.63

Saptosari	484	480	99.17	453	93.60
Tepus I	138	136	98.55	113	81.88
Tepus II	244	176	72.13	199	81.56
Tanjung sari	352	352	100	311	88.35
Rongkop	261	209	80.08	234	89.66
Girisubo	263	263	100	217	82.51
Semanu I	413	412	99.76	386	93.46
Semanu II	353	353	100	331	93.77
Ponjong I	423	423	100	403	95.27
Ponjong II	200	154	77.00	156	78.00
Karangmojo I	403	302	74.94	322	79.90
Karangmojo II	329	329	100	255	77.51
Wonosari I	398	298	74.87	376	94.47
Wonosari II	704	624	88.64	633	89.91
Playen I	367	367	100	338	92.10
Playen II	327	327	100	323	98.78
Patuk I	164	164	100	160	97.56
Patuk II	198	198	100	170	85.86
Gedangsari I	252	219	86.90	209	82.94
Gedangsari II	247	247	100	228	92.31
Nglipar I	182	162	89.01	154	84.62
Nglipar II	225	225	100	198	88.00
Ngawen I	275	275	100	266	96.73
Ngawen II	194	191	98.45	174	89.69
Semin I	403	403	100	345	85.61
Semin II	280	280	100	276	98.57
Gunungkidul district	9086	8510	93.66	8066	88.77

Table 3 shows that 17 of 30 PHCs had 100% coverage of iron supplementation for 30 tablets in 2015 and the coverage of iron supplementation of 30 tablets in Gunungkidul District 2015 reached 93.66%. The coverage of iron supplementation for total 90 iron tablets in Gunungkidul District in 2015 was 88.77%. Eleven of 30 PHCs had more than 90% coverage of total 90 iron tablets.

The prevalence rate of anemia among pregnant women in Gunungkidul District 2015 was 21.88%. The comparison between the output (the coverage of iron supplementation for 90 tablets) and outcome (the prevalence rate of anemia) of Iron Supplementation Program in Gunungkidul District can be seen in Figure 1.

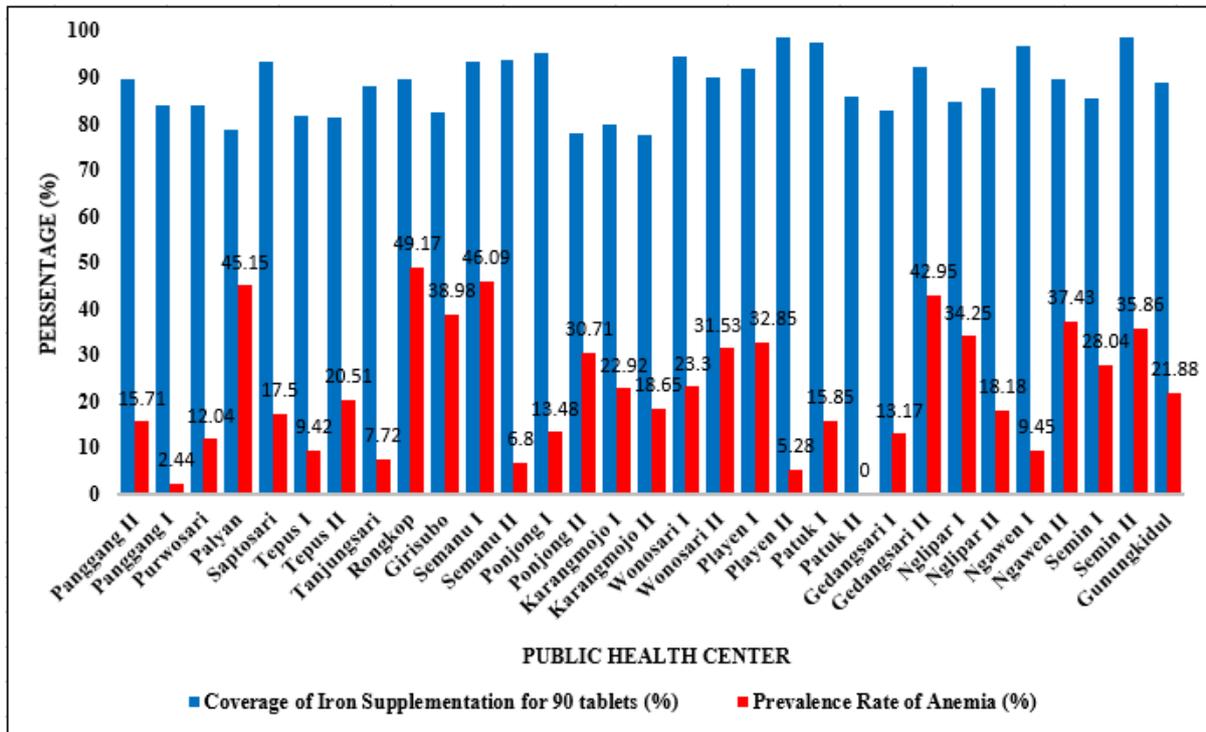


Figure 1. Output and Outcome of Iron Supplementation Program in All Public Health Centers in Gunungkidul, Indonesia, 2015.

Most of the PHCs in Gunungkidul had a high rate of anemia prevalence. Rongkop PHC (49.17%) had the highest anemia prevalence compared to the other PHCs in Gunungkidul in 2015. In another hand, Panggang I PHC (2.44%) had the lowest anemia prevalence among pregnant women. There was 0% of anemia prevalence in Patuk II PHC for they did not measure the hemoglobin concentration of pregnant women during 2015. Figure 2 shows that most PHCs in Gunungkidul District had not only good coverage of iron supplementation but also a high prevalence of anemia.

Discussion

Iron supplementation program was supported by adequate resources in Gunungkidul DHO and most of the PHCs. When there was no stock of iron tablets in DHO at the end of 2015, some PHCs provided the iron tablets using PHC own budget. The output showed the good coverage of iron supplementation both 30 tablets and total 90 tablets in Gunungkidul District. The numbers exceeded the target of minimum service standards of Gunungkidul DHO (90% for 30 iron tablets and 82% for 90 iron tablets). In another hand, outcome showed the high prevalence of anemia among pregnant women in Gunungkidul District in 2015. This number had exceeded the minimum targets of Local Government Medium-term Development Plans (10,5%) and District Health Office (DHO) (15%) in 2015. This study indicated that the good coverage of iron supplementation was not followed by the low anemia prevalence among pregnant women in Gunungkidul District in 2015.

Interviews showed most midwives and nutritionists could not ascertain whether the iron supplementations actually consumed by pregnant women or not. They stated that most pregnant women did not like the taste of the iron tablets because it tasted bitter, fishy, and then caused nausea and vomiting. The interviews also showed that the implementation of iron supplementation was not timely as the guidelines. According to the guideline, the 30 iron tables should be given to pregnant women during the first trimester of pregnancy because of hemoglobin levels in pregnant women decreased in the first trimester (Ministry of Health of

Indonesia, 2015). But most midwives gave the 30 iron tablets at the second trimester of pregnancy. When there was no stock of iron tablets in DHO at the end of 2015, some PHCs provided the iron tablets using PHC own budget.

These findings are in contrast with the previous study that showed iron supplementation during pregnancy was effective to prevent maternal anemia (Peña-Rosas *et al.* 2012). A study in Yogyakarta City showed the iron supplementation for pregnant women was not effective to reduce the anemia prevalence in pregnancy because of the low coverage of iron supplementation in the last five years (Maitri *et al.* 2017). Other study showed that the adherence of iron tablet consumption was the most important factor affecting anemia during pregnancy (Ar & Rahmah, 2010). Direct observation to monitor the administration of iron supplementation improved the adherence of iron tablets consumption among pregnant women (Bilimale *et al.* 2010). Short Message Service (SMS) reminder improved the adherence of iron consumption among pregnant women (Ermiati *et al.* 2017).

In addition, WHO showed that anemia among pregnant women can be caused not only by iron deficiency but also by other deficiencies (folate acid, vitamin B12 and vitamin A deficiencies), chronic inflammation, parasitic infections, and inherited disorders (World Health Organization [WHO] 2011). Another study also showed that food consumption of vegetables and fruits (≥ 30 times/month) was a protective factor against the iron deficiency anemia in pregnant women (Darlina, 2013). In other hands, other study showed that there was no correlation between the consumption of iron tablet with hemoglobin levels (Wara, 2006).

Limitations of this study were not involving the pregnant women as respondents of evaluation.

Conclusion

Input, process and output variables showed a good program performance but outcome indicator showed a high rate of anemia. High coverage of iron supplementation was not followed by the low prevalence of anemia among pregnant women in Gunungkidul District in 2015. Efforts are needed to be put on ensuring the adherence of pregnant women to take all the administered iron supplements. Direct observation of iron tablets consumption during pregnancy should be done. A text message can be used to remind the iron tablet consumption to pregnant women, DHO needs to ensure the iron supply through better logistic planning & budgeting, the guideline books should be distributed to all Health Centers and further researches are needed to analyze the iron consumptions adherence and factors associated with anemia in Gunungkidul.

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