Under-Utilization of Maternal-Child Healthcare Services and Adverse Outcomes of Unwanted Pregnancies in Urban and Rural Areas of Indonesia

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Abstract

The study examines the association of unwanted pregnancy and the utilization of maternal-child health services, and the adverse health outcomes in urban and rural settings. The study employed data from the 2017 Indonesia Demographic Health Survey that included 13,806 live births; the mothers were not pregnant at the interview and were married participants. The multiple logistic regression analysis concerning residential areas was conducted separately to compare outcomes related to unwanted pregnancy. Non-standard antenatal care visits (adjusted odds ratio [AOR]=1.7; 95% confidence interval [CI]=1.2–2.4), prolonged labor (AOR=1.6; 95% CI=1.2–2.1), the absence of child's birth documentation (AOR=1.3; 95% CI=1.0–1.6), and smaller baby size (AOR=1.2; 95% CI=1.0–1.4) are associated with unwanted pregnancy in urban areas. In rural settings, on the other hand, unwanted pregnancy is associated with non-standard antenatal care (AOR=1.6; 95% CI=1.2–2.2). Therefore, in Indonesia, urban areas lack maternal-child healthcare services utilization and higher adverse events due to unwanted pregnancy than rural areas. An adjustment approach is required in maternal-child health-related programs in both areas, particularly for women living in urban.

Keywords

Adverse outcome; child health; health services; maternal health; unwanted pregnancies

Introduction

Unwanted pregnancy denotes the instance when children are not expected. Such pregnancies have more adverse health outcomes than mistimed pregnancies (Beyene, 2019). Unwanted pregnancy has become a global public health issue and is inversely associated with both the mother's and baby's health outcomes (Rahman et al., 2016; Yazdkhasti et al., 2015). The global rate of unwanted pregnancies is 41% of all pregnancies, despite a reduction of 17% from 1995 to 2008 (Shah & Åhman, 2009). Unwanted pregnancies increase exposure to unsafe abortions. If a woman cannot have an abortion, it may affect her pregnancy and her relationship with her baby (Shreffler et al., 2021). Previous studies have shown that mothers who kept the babies rather than having an abortion suffered significantly due to issues associated with the pregnancy, delivery, and postpartum complications. These issues ranged from anemia, nausea, vomiting, swollen feet, prolonged labor, a high tendency of maternal depression during and after giving birth, mental health issues, and more apparent marital conflicts (Bahk et al., 2015), premature birth (de Oliveira et al., 2019), poor nutrition during pregnancy (Ayele et al., 2020), to low birth weight (Wado et al., 2014). Additionally, because the mother is less interested in having a child, children tend to be neglected and experience physical aggression from their parents if they were born from an unwanted pregnancy (Guterman, 2015).

Unwanted pregnancy is related to the underutilization of healthcare services (Abame et al., 2019; Hajizadeh & Nghiem, 2020; Rahman et al., 2016). By delaying or not seeking antenatal and delivery care, women face a higher risk than those who make use of healthcare services (Rahman et al., 2016). Hajizadeh and Nghiem (2020) showed that unwanted pregnancy, compared with the optimal number of visits, significantly lowered the visitation of antenatal care (ANC). An unwanted pregnancy might not be recognized or realized right away, and even if the mother suspects she is pregnant, she might feel anxious that others will find out. Unwanted pregnancy may also contribute to the conscious or unconscious abandonment of both the woman's and child's health (Rahman et al., 2016).

The area of residence ('urban and rural' hereafter) is widely known to be a significant determinant in many health problems, showing discrepancies in several aspects, including health resources and demographic characteristics. Studies from Egypt and Bangladesh exposed higher incidences of unwanted pregnancies in rural areas compared to urban areas (Bishwajit et al., 2017; Mohamed et al., 2019). The Egypt study suggested 'education gap' as the primary possible determinant of the result; meanwhile, the Bangladesh study highlighted the lack of safe abortion procedures in rural areas. On the contrary, Islam and Sultana (2019) focused on women who resided in urban areas and stressed the importance of rapid urbanization affecting the growth of urban slums. The study also disclosed the probability that the women living in urban slums might have less access to quality health services than those living in rural areas. Hence, the area of residence has always been a determinant of interest in health studies.

The 2017 Indonesia Demographic Health Survey (IDHS) indicated that 7.4% of women experienced unwanted pregnancies. Although this amount seems small, the estimate would be 336,000 births, considering the average birth rate of 4.8 million children per year (BKKBN et al., 2018). Moreover, this figure showed an increase from 2013 Indonesian basic health research, which reported 5.8% of women experienced unwanted pregnancies (Guspaneza & Martha, 2019). However, previous studies that employed DHS data referred unwanted pregnancy to women who answered, 'yes' and 'wanted later' when asked 'At the time you

became pregnant, did you want to become pregnant then; did you want to wait until later, or did you want no more children at all?' Women who answered 'wanted later,' as in mistimed pregnancies, were expected to accept the pregnancy and might have no difference in their use of healthcare (Exavery et al., 2014). The prevalence and association of unwanted pregnancy may be different according to this inclusion. This study, therefore, referred unwanted pregnancy to women who answered 'no more' to the same question in the analysis. In addition, to the best of the authors' knowledge, the association of unwanted pregnancy and maternal and child health outcomes in Indonesia was never examined using a representative survey. This study will be the first to determine this association by residential areas.

Methods

The study utilized data from the 2017 Indonesia Demographic Health Survey (IDHS) (SI & NPFPB, 2018). The 2017 IDHS surveys are nationwide representative household surveys involving 49,627 units of data from individual women. The DHS assembles equivalent and reliable statistics on various maternal-child health and health service indicators by utilizing a multistage sampling procedure. To collect the survey data, direct interviews are conducted by trained interviewers. The data collection methods, reliability, and validation assessments are available (see Rutstein & Rojas, 2006). The final sample for this study included a total of 13,806 last birth children aged 0–59 months whose mothers were not pregnant at the time of the interview and who were married. The total sample was the same in all outcome variables, except for basic immunization and baby check-up within the first two months; the sample only included children aged one-year-old and above (10,423 last birth children). Since the comparative aspect of the study used the participants' residential areas, a complete analysis was conducted separately for urban and rural settings.

The study scrutinized the effect of unwanted pregnancy on the utilization of maternal-child healthcare services and its adverse health outcomes. Based on previous research, maternal outcomes in this study included antenatal care visits, prolonged labor, complications during pregnancy, and self-reported postpartum depression. Meanwhile, birth registration, the baby's size at birth, the baby's check-up within the first two months since delivery, and basic child immunization required by the Indonesian government were included as the outcome measures of child outcomes. In Indonesia, basic child immunization is defined as completing 12 doses of five vaccines (bacillus Calmette-Guérin (BCG [tuberculosis vaccine]), diphtheria-pertussis-tetanus (DPT), oral polio vaccine (OPV), hepatitis B (HB), and measles) given ideally before one-year-old. The ANC visit was recoded to binary options of standard and non-standard visit, referring to Indonesia's standard of a minimum of four ANC visits during each pregnancy. Prolonged labor, complications during pregnancy, and postpartum depression were recoded as binary options 'yes' or 'no.' Documenting birth registration and the baby's check-up was also recoded as binary options 'yes' or 'no.' The baby's size at birth was recorded as 'normal' or 'less than average.' Basic child immunization was classified as 'complete' or 'incomplete/unknown.'

Unwanted pregnancy was treated as an explanatory variable, and the classification of wanted and unwanted pregnancy was referred to as 'the intention of the pregnancy.' The DHS classified pregnancy intention from the response to one of the questions asked on the questionnaire: 'At the time you became pregnant, did you want to become pregnant then; did you want to wait until later, or did you want no more children at all?' (Marston & Cleland, 2003). The study only included unwanted pregnancy inferred if the mothers answered, 'no

more for their pregnancy.' Mothers who answered 'wanted to wait' were expected to accept the pregnancy and might have no difference in their use of healthcare.

The mother covariates and household level were controlled, including the mother's age during first birth, highest education level, household wealth index, and the ownership of health insurance (Hajizadeh & Nghiem, 2020). In highly patriarchal societies, the analysis also controlled for the child's gender, as mentioned in other studies (Naveed et al., 2018; Rahman, 2015). The baby's gender could influence the mother's decision or care during pregnancy. This study, however, did not include birth order due to the multicollinearity with pregnancy intention in the analysis.

The study performed multiple logistic regressions to analyze the effect of unwanted pregnancy on ANC visits, pregnancy complications, prolonged labor, childbirth registration, postpartum depression, whether the baby was checked within the first two months since delivery, the baby's size at birth, and the completion of basic child immunization. Additionally, the study was controlled for exogenous independent variables. The analysis applied the standard weights denormalization approach for each observation (ICF International, 2012). The marginal effect employed 95% CI considering the geographical sample clustering effect. The analysis was conducted in R version 3.6.3 (R Core Team, 2019) with aod (Lesnoff & Lancelot, 2012) for the regression analysis.

Results

Sociodemographic characteristics

A descriptive analysis was conducted to stratify the proportion of unwanted pregnancies by the area of residence (Table 1). In urban areas, there was a high occurrence (23.1%) of unwanted pregnancies among mothers with no education. The lowest quintile of the wealth index (11.6%), women aged less than 20 years when they first gave birth (13.2%), those not covered by health insurance (10.6%), and women pregnant with male babies (10.5%) in urban areas appeared to have a higher proportion of unwanted pregnancies. On the contrary, in rural areas, the highest occurrence of unwanted pregnancies was found among the wealthiest members of the population (7.7%), primarily educated mothers (7.6%), and those covered by health insurance (6.2%). According to the statistics, unwanted pregnancy was predominant among young mothers below 20 years of age when they first gave birth and women pregnant with male babies in urban and rural areas.

Table 1: Household and Mother's Characteristics by Pregnancy Intention

Variable	Residency Areas									
	Urban (n=6932)*				*p*-value	Rural (n=6874)*				*p*-value
	Wanted		Unwanted			Wanted		Unwanted		
	n	%	n	%		n	%	n	%	
Education Level										
No Education	20	76.9	6	23.1	0.000	98	93.3	7	6.7	0.000
Primary	1,008	87.8	140	12.2		2,054	92.4	168	7.6	
Secondary	3,806	89.7	438	10.3		3,407	94.2	211	5.8	
Higher	1,412	93.3	102	6.7		899	96.8	30	3.2	
Wealth Index										

Variable	Residency Areas									
	Urban (n=6932)*				*p*-value	Rural (n=6874)*				*p*-value
	Wanted		Unwanted			Wanted		Unwanted		
	n	%	n	%		n	%	n	%	
Poorest	533	88.4	70	11.6		2,631	94.6	151	5.4	
Poorer	952	89.9	107	10.1		1,588	93.6	108	6.4	
Middle	1,321	90.4	141	9.6	0.691	1,120	94.0	71	6.0	0.100
Richer	1,629	90.1	178	9.9		735	93.2	54	6.8	
Richest	1,811	90.5	190	9.5		384	92.3	32	7.7	
Health Insurance										
Covered	4,111	91.4	486	8.6	0.001	3,814	93.8	250	6.2	0.941
Uncovered	2,135	89.4	200	10.6		2,644	94.1	166	5.9	
Age of 1st Birth										
<20	1,374	86.8	209	13.2		2,135	92.1	184	7.9	
20-35	4,790	91.0	475	9.0	0.000	4,272	94.9	231	5.1	0.000
>35	82	97.6	2	2.4		51	98.1	1	0.9	
Child's Gender										
Male	3,185	89.5	374	10.5	0.236	3,332	93.9	201	6.2	0.759
Female	3,061	90.8	312	9.2		3,126	94.0	215	6.0	

*Note: *Weighted Frequency*

Maternal-child health service utilization and adverse health outcomes

The bivariate analysis results showed different outcomes for the mother and child with respect to their areas of residence. Pregnancy intention was associated with antenatal care visits, prolonged labor, birth registration, and baby's size at birth in urban areas. Meanwhile, in rural settings, pregnancy intention was only related to ANC visits (Table 2).

Table 2: Maternal-Child Health Service and Health Outcomes by Pregnancy Intention

Variable	Residency Areas									
	Urban				*p*-value	Rural				*p*-value
	Wanted		Unwanted			Wanted		Unwanted		
	n	%	n	%		n	%	n	%	
ANC Visit										
Standard	5,944	90,4	631	8.6	0.000	5,893	94.2	363	5.8	0.002
Non-standard	302	84.6	55	15.4		565	91.4	53	8.6	
Pregnancy Complications										
Yes	1,225	90.7	125	9.3	0.852	1,024	93.4	72	6.6	0.760
No	5,021	90.5	526	9.5		5,434	94.0	344	6.0	
Prolonged labor										
Yes	392	87.6	55	12.4	0.004	394	94.2	24	5.8	0.061
No	5,854	90.3	631	9.7		6,064	94.0	392	6.0	
Postpartum depression										
Yes	263	90.0	29	10.0	0.833	141	92.7	11	7.3	0.587
No	5,983	90.1	657	9.9		6,317	94.0	405	6.0	
Birth Registration										
Yes	5,409	90.3	578	9.7	0.007	4,537	94.1	282	5.9	0.225
No	837	88.6	108	11.4		1,921	93.5	134	6.5	

Variable	Residency Areas									
	Urban				*p*-value	Rural				*p*-value
	Wanted		Unwanted			Wanted		Unwanted		
	n	%	n	%		n	%	n	%	
Baby's size at birth										
Average	4,274	90.5	451	9.5	0.026	4,161	93.6	282	6.4	0.174
Smaller	1,972	89.4	235	10.6		2,297	94.4	134	5.6	
Basic Immunization										
Complete	1,060	90.3	114	9.7	0.800	978	94.0	62	6.0	0.668
Incomplete/Unknown	3,688	90.0	408	10		3,853	93.7	260	6.3	
Baby's Checkup										
Yes	3,330	90.2	362	9.8	0.710	4,831	93.8	322	6.2	0.551
No	1,418	89.9	160	10.1		1,380	94.1	87	5.9	

Health service utilization and adverse health outcomes in unwanted pregnancies

The multiple logistic regression highlighted the various impacts of unwanted pregnancy on health service utilization and health outcomes while adjusting for the controlled variables. In urban areas, unwanted pregnancies were related to non-standard ANC visits (AOR=1.7; 95% CI=1.2–2.4), prolonged labor (AOR=1.6; 95% CI=1.2–2.1), the absence of proper birth documentation for their babies (AOR=1.3; 95% CI=1.0–1.6), and further, unwanted pregnancy in urban areas was associated with a smaller-than-average size of babies at birth (AOR=1.2; 95% CI=1.0–1.41) (Table 3).

In rural settings, on the other hand, unwanted pregnancies were significantly associated with non-standard ANC visits (AOR=1.6; 95% CI=1.2–2.2) even after being adjusted for controlled variables (Table 4). It was thus concluded that unwanted pregnancy does not affect child outcomes in rural areas.

Table 3: Multiple Logistic Regression of Unwanted Pregnancy Effect on Maternal and Child Outcomes in Urban Areas

Variable	Outcome Variables							
	Maternal Outcomes (Adjusted OR (95% CI Lower-Upper)				Child Outcomes (Adjusted OR (95% CI Lower-Upper)			
	Non-Standard ANC	Pregnancy Complications	Prolonged Labor	Self-reported Post-partum Depression	Unregistered Birth	The baby did not have a check-up	Less than average baby size	Incomplete / unknown Immunization
Exposure variable								
Pregnancy								
Unwanted	1.7(1.2-2.4)*	1.0(0.8-1.3)	1.6(1.2-2.1)*	1.1(0.7-1.6)	1.3(1.0-1.6)*	0.9(0.7-1.0)	1.2(1.0-1.4)*	1.1(0.8-1.3)
Wanted	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Controlled variables								
Sex of Child								
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	1.0(0.8-1.3)	1.0(0.9-1.1)	0.9(0.7-1.0)	1.0(0.8-1.3)	1.0(0.9-1.2)	1.1(1.0-1.3)	0.9(0.8-1.0)*	1.2(1.1-1.4)*
Mother's Education								
No Education	6.8(2.4-19.3)*	1.6(0.5-4.9)	3.7(2.3-6.5)*	1.1(0.2-5.8)	4.1(1.8-9.5)*	2.5(1.1-6.0)*	1.1(0.9-1.4)	2.7(0.7-10.2)
Primary	6.0(2.3-15.5)*	1.4(0.5-4.1)	3.5(2.4-6.0)*	0.7(0.1-3.8)	3.3(1.4-7.4)*	2.1(0.9-5.0)	1.0(0.4-2.3)	2.5(0.7-9.2)
Secondary	5.2(3.2-8.6)*	1.3(0.5-4.0)	2.5(2.0-5.2)*	0.4(0.1-0.7)	2.5(1.1-5.6)*	2.1(0.9-4.9)	0.9(0.7-1.0)	1.7(0.5-6.5)
Higher	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age of 1st Birth								
<20	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
20-35	1.6(1.2-2.1)*	1.0(0.9-1.3)	0.9(0.7-1.2)	0.8(0.5-1.0)	1.5(1.3-1.8)*	1.1(0.9-1.3)	1.2(1-1.3)*	1.5(1.3-1.8)*
>35	6.0(6.5-75.3)	1.6(1.0-2.7)*	0.1(0.0-1.4)	0.5(0.2-1.8)	1.5(0.7-3.2)	0.7(0.4-1.2)	2.4(1.2-4.3)*	1.5(0.7-3.2)
Health Insurance								
Uncovered	1.3(0.9-1.7)	1.2(1.0-1.4)*	1.3(1.1-1.6)*	1.1(0.8-1.4)	1.3(1.1-1.5)*	1.1(0.9-1.2)	1.0(0.9-1.1)	1.2(1.1-1.4)
Covered	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Wealth Index								
Poorest	5.2(1.9-13.5)	1.3(1.0-1.8)	0.9(0.5-1.4)	0.9(0.5-2.0)	4.1(3.0-5.4)*	1.0(0.7-1.3)	1.2(1.0-1.3)*	1.0(0.7-1.3)
Poorer	3.5(2.3-5.3)	1.5(1.2-2.1)*	1.4(0.9-2.2)	1.5(0.8-3.0)	2.8(2.2-3.6)*	1.2(0.9-1.6)	0.9(0.7-1.1)	0.9(0.7-1.2)
Middle	2.2(1.5-3.3)	1.3(1.0-1.8)*	1.1(0.7-1.8)	1.2(0.6-2.4)	2.6(2.0-3.3)*	1.2(0.9-1.5)	1.2(1.0-1.4)	0.9(0.6-1.1)
Richer	1.9(1.3-2.9)	1.1(0.8-1.5)	0.9(0.6-1.5)	1.9(1.0-3.8)	1.8(1.4-2.4)*	1.0(0.8-1.3)	1.0(0.9-1.2)	0.7(0.5-1.0)
Richest	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref

*Note: The effect of unwanted pregnancy and controlled variables are adjusted odds ratio (AOR) with 95% Confidence Interval (CI); *p-value of <0.05; 'Ref' = Reference group*

Table 4: Multiple Logistic Regression of Unwanted Pregnancy Effect on Maternal and Child Outcomes in Rural Areas

Variable	Outcome Variables							
	Maternal Outcomes (Adjusted OR (95% CI Lower-Upper)				Child Outcomes (Adjusted OR (95% CI Lower-Upper)			
	Non-Standard ANC	Pregnancy Complications	Prolonged Labor	Self-reported Post-partum Depression	Unregistered Birth	The baby did not have a check-up	Less than average baby size	Incomplete / unknown Immunization
Exposure variable								
Pregnancy								
Unwanted	1.6(1.2-2.2)*	1.0(0.8-1.3)	1.4(0.9-2.1)	1.1(0.7-1.6)	1.2(0.9-1.5)	0.9(0.7-1.1)	1.1(0.9-1.4)	1.0(0.8-1.3)
Wanted	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Controlled variables								
Sex of Child								
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	1.3(1.1-1.6)*	0.9(0.8-1.1)	1.0(0.8-1.2)	1.0(0.8-1.3)	0.9(0.8-1.1)	1.2(1.0-1.3)*	1.3(1.2-1.5)*	1.1(1.0-1.2)
Mother's Education								
No Education	1.6(0.7-2.9)	1.2(1.0-1.5)	2.1(0.6-7.5)	1.1(0.2-5.9)	2.1(1.2-3.5)*	1.3(0.7-2.6)	1.0(0.9-1.1)	1.3(0.6-2.9)
Primary	1.7(0.8-3.4)	1.0(0.5-2.2)	1.7(0.5-5.9)	0.7(0.1-3.8)	2.1(1.3-3.5)*	1.1(0.6-2.0)	1.1(0.8-1.3)	1.6(0.7-3.7)
Secondary	1.4(0.7-2.9)	1.0(0.8-1.3)	0.9(0.3-3.2)	0.4(0.1-2.3)	1.9(1.2-3.3)*	1.1(0.6-2.0)	1.0(0.8-1.3)	1.3(0.6-3.1)
Higher	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age of 1st Birth								
<20	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
20-35	1.5(1.2-1.8)*	1.0(0.9-1.2)	1.0(0.8-1.2)	0.8(0.5-1.0)	1.4(1.3-1.6)*	1.1(0.9-1.2)	1.0(0.9-1.1)	1.1(1.0-1.3)
>35	1.3(0.4-4.1)	1.8(0.9-3.6)	0.6(0.1-2.5)	0.5(0.2-1.8)	1.5(0.7-3.2)	0.6(0.3-1.2)	1.1(0.6-2.1)	1.8(0.8-3.9)
Health Insurance								
Uncovered	1.2(1.1-1.4)*	1.2(1.1-1.4)*	1.2(1.0.-1.5)*	1.1(0.8-1.4)	1.0(0.9-1.1)	1.0(0.9-1.1)	1.0(0.9-1.1)	1.2(1.0-1.3)*
Covered	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Wealth Index								
Poorest	4.4(2.4-8.0)*	1.5(1.2-1.9)*	1.9(1.4-2.7)*	1.9(1.0-3.7)	6.1(4.4-8.3)*	1.4(1.1-1.8)*	1.0(0.8-1.2)	1.4(1.2-1.7)*
Poorer	2.4(1.7-3.4)*	1.4(1.1-1.7)*	1.3(0.9-1.7)	1.2(0.6-2.4)	3.9(3.2-4.8)*	1.6(1.3-2.0)*	1.1(1.0-1.3)	1.3(1.1-1.6)*
Middle	1.8(1.4-2.4)*	1.3(1.1-1.5)*	1.5(1.2-1.9)*	0.9(0.5-2.0)	3.6(3.1-4.3)*	1.3(1.1-1.5)*	1.0(0.9-1.2)	1.2(1.0-1.5)
Richer	1.5(1.2-1.8)*	1.1(0.9-1.4)	1.4(1.1-1.8)	1.5(0.8-3.0)	2.3(2.0-2.7)*	1.3(1.1-1.6)*	1.2(1.0-1.4)*	1.3(1.0-1.7)
Richest	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref

*Note: The effect of unwanted pregnancy and controlled variables are adjusted odds ratio (AOR) with 95% Confidence Interval (CI); *p-value of <0.05; 'Ref' = Reference group*

Discussion

While pregnancy usually comes with positive expectations for most women, pregnancy also presents physiological and psychological challenges. In the case of unwanted pregnancy, there are fewer positive expectations and more severe implications, ranging from physical health issues to economic and social consequences for both women and their families (Dibaba et al., 2013a). The findings in the study revealed that in urban areas, unwanted pregnancies are associated with more adverse outcomes and less utilization of maternal and child health care than in rural areas.

The multiple logistic regression analysis points to significant associations of unwanted pregnancies with less adequate antenatal care visits in rural and urban areas. The result is consistent with a meta-analysis study that identifies the higher odds of inadequate ANC visits among mothers with an unwanted pregnancy in low- and high-income countries (Dibaba et al., 2013b). Abame et al. (2019) stated that 69% of mothers with unwanted pregnancies have fewer ANC visits than the average population and experienced more than four delays when initiating an early ANC visit (Abame et al., 2019; Yargawa et al., 2021). Research conducted in Bangladesh found that 55% of women with unwanted pregnancies attended ANC visits only once during pregnancy (Mkandawire et al., 2019; Rahman et al., 2016). In addition, in rural areas, the wealth quintile is significantly associated with inadequate ANC. Mondal et al. (2020) stated that the poor quintile group had an almost two-fold risk of receiving inadequate ANC and postnatal care and four times higher risk of delivering at home.

In urban areas, unwanted pregnancies were found to be independent factors for prolonged labor, smaller baby size at birth, and the absence of birth registration. One hospital-based study in Bangladesh indicated that unwanted pregnancies had higher odds of obstetric complications, including prolonged labor, obstructed labor, breech presentation, bleeding, and premature rupture of membrane (Rahman et al., 2019). Despite poorly understood mechanisms about the relationship, Dott et al. (2010) explained the association of unwanted pregnancy with unhealthy maternal behavior. Mothers who are not emotionally ready and exhibit harmful maternal behavior—smoking, ignoring the baby, using illegal drugs, etc.—and ensuring inadequate ANC would increase obstetric complications. Previous literature repeatedly mentioned low birth weight as an adverse outcome in women with an unwanted pregnancy (Hall et al., 2017; Rahman et al., 2019; Wado et al., 2014). In line with the unhealthy behavior of the mothers mentioned before, this result is also encouraged by Kimmel et al. (2016), who showed that eating disorders in mothers are possibly aligned with an unplanned pregnancy. Eating disorders may entail less eating, affecting fetus nutrition and influencing the baby's size at birth.

Unwanted pregnancies in urban areas are also associated with the absence of birth registration. Previous studies indicated that women's autonomy has a significant role in unregistered children's birth (Mohanty & Gebremedhin, 2018; Mondal et al., 2020). A study of women's autonomy in Bangladesh indicated that maternal autonomy is highly related to pregnancy intention. Unintended or unwanted pregnancies are prevalent if the mother has a lack of autonomy in the household. The logistic regression result also displays a higher probability of the absence of birth documentation in poor households (Rahman, 2012). A study on the association of maternal autonomy with birth registration conducted in India indicated that the ability of women to move around might be correlated with wealthier households since direct or indirect costs heavily discourage low-income households from

registering births officially. In Indonesia, the urban poor mostly have less access to public facilities, including health and governmental facilities, due to a lack of official identification (Mohanty & Gebremedhin, 2018).

In rural settings, unwanted pregnancies do not appear as primary determinants of most mother and child health care utilization and their health outcomes. The regression analysis uncovered that health insurance is the main factor for most maternal health outcomes; meanwhile, low education and poor household are the main determinants of child outcomes. These results indicate that household factor veiled the individual elements in rural areas thus may be related to the overall women's autonomy. In addition, rural women with a low level of education tend to express their intention less than women in urban areas (Acharya et al., 2016; O'Donnell et al., 2018). The incidence of unwanted pregnancies in rural areas might be underestimated. The results from a recent study of six Asian countries also indicated that a higher incidence of unwanted pregnancies in rural areas was more commonly reported than those in urban areas (Sarder et al., 2021).

As far as we know, this is the first study concerning unwanted pregnancy as the independent variable for maternal and child health care and outcomes using the 2017 Indonesian Demographic Health Survey. Further, the study separately analyses the type of residence based on previous reports showing the significance of urban-rural settings in unwanted pregnancy prevalence. The study, however, has limitations. The inaccuracy of birthweight information in IDHS 2017 causes the use of the baby size perception at birth, leading to a bias in the study. Referring to previous works of literature using DHS data, many infants in developing countries are not weighed at birth and thus will not have a recorded birth weight. It is challenging to use birth weight. However, in a study utilizing several DHS data, the results indicate that a mother's perception of size is a good proxy for birth weight in extensive nationally representative surveys (Channon, 2011; Channon et al., 2011). Second, due to collinearity with some questions of women's autonomy and birth order, the study could not include the two variables as control. Thus, further analysis on women's autonomy needs to be conducted separately.

Conclusion

This study aimed to descriptively compare how unwanted pregnancies and associated health outcomes were distributed in rural and urban areas. Unwanted pregnancies were significantly associated with fewer antenatal care visits than the standard number of visits in urban and rural settings. This finding indicated that maternal healthcare utilization is directly linked to pregnancy intention – whether wanted or unwanted – irrespective of the locations of the women. In urban areas, unwanted pregnancies have significant effects on more adverse health outcomes. The issue shines a spotlight on the urgent need for awareness on the higher incidence of unwanted pregnancies in Indonesia due to the impact of rapid urbanization, especially among those with inadequate resources to survive in the city. The rapid growth of slums and the tendency of individuals to adopt unhealthy behaviors could lead to adverse health events and cause a higher cost burden on health.

This study suggests a direct relationship between the adverse health outcomes of women, and pregnancy status, especially where they cannot access comprehensive health facilities and healthcare professionals. Moreover, the demography characteristics of having an unwanted pregnancy came out differently in both settings. This finding highlights the need for an

adjustment approach in programs related to maternal-child health in both areas, which cannot be generalized; thus, the promotion and prevention strategy would be more effective in reducing maternal and child mortality.

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