
OBSTETRICS

Rate and Predictors of Infant Abandonment among Unmarried Mothers at a Public Hospital in Kedah, Malaysia: A retrospective study

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ABSTRACT

Objectives: This study aimed to determine the rate of unmarried mothers who decided to abandon their infants at the Hospital Sultan Abdul Halim, Kedah, Malaysia and the predictors that influenced such decisions.

Materials and Methods: A retrospective study was conducted on unmarried mothers who gave birth at the hospital between January 2011 and December 2013. Information about their sociodemographic and clinical characteristics and their decisions on whether to abandon their infants was obtained from medical records. Furthermore, the predictors of infant abandonment were identified through binary logistic regression analysis.

Results: Of the 266 unmarried mothers included in this study, nearly half were aged less than 20. Most of them were Malay, unemployed and first-time mothers with a generally low educational level and income. Fifty (18.8%) of them decided to abandon their children, and the predictors of making such decisions included being aged 30 or above (adjusted odds ratio [aOR] 3.33 [95% confidence interval {CI} 1.21–9.15]), having rape-related pregnancy (aOR 5.89 [95% CI 2.10–16.53]) and having unemployed male partners (aOR 3.10 [95% CI 1.50–6.39]).

Conclusion: This study revealed that infant abandonment was common in the studied area, particularly among unmarried mothers with complex social factors. The factors that can be used to predict decisions on infant abandonment included the mother's age, rape-related pregnancy and employment status of the male partner.

Keywords: abandonment, infant, Malaysia, unmarried mother.

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Introduction

Premarital pregnancy is deemed socially unacceptable, particularly in eastern countries^(1,2). Young women are taught to protect their virginity before marriage, and any deviation from sexual norms may result in embarrassment to their families and social stigma^(3,4). Consequently, women with premarital pregnancies tend to give up their infants for adoption after giving birth^(5,6) or, in a worst-case scenario, infants are abandoned to die^(7,8). In general, the issue of infant abandonment by unmarried mothers is not a focus in the literature. An early study by Ventura found that the proportion of premarital pregnancy increased from 10% in the 7th century to nearly 30% in the late 18th century⁽⁹⁾. Another analysis showed that in 2013, more than 1.6 million births were recorded among unmarried women⁽¹⁰⁾.

Various factors are considered potential risk factors for unmarried mothers who abandon their infants. The association between the mother's age and her decision to abandon her child has been frequently studied. However, findings have been inconsistent⁽¹¹⁻¹³⁾. Other factors that forced the single mother to abandon the infants were low incomes⁽¹²⁾, high educational level⁽¹³⁾, brought up in intact families, and influences from the male partners⁽¹⁴⁾. Women who were raped commonly abandon their newborns^(6,15). Furthermore, parity, initiation of prenatal care and gender of the children, which are pregnancy-related factors, influence mothers' decisions on infant abandonment^(11,13).

Malaysia is known for its diverse cultures and traditions. The Malaysian population consists of the ethnic groups Malay-Bumiputra (68.6% of the population), Chinese (23.4%), Indian (7.0%) and others (1.0%)^(16,17). Despite firm religious beliefs and traditional values, the number of unmarried mothers is rising in Malaysia. The National Obstetrics Registry, a clinical database that compiles nationwide obstetrics data, indicated that between 2011 and 2012, approximately 5,200 cases of premarital pregnancies were recorded in 14 government-funded tertiary hospitals⁽¹⁸⁾. Of these cases, the highest

incidence was reported among women aged 21–30, followed by those aged 10–20 and 31–40. This pressing issue is also reflected by the increasing numbers of illegitimate children born in the country. For the period 2005–2015, the National Registration Department (NRD) reported that 532,158 children were born out of wedlock in Malaysia⁽¹⁹⁾.

The fear of being religiously and socially stigmatised, coupled with uncertainty about raising children without familial and financial support, may cause unmarried mothers to abandon their children⁽²⁰⁾. Poor knowledge and the lack of awareness about adoption may also be contributing factors to such a decision. Although premarital pregnancy and infant abandonment have been substantially discussed, local studies on these topics are limited. In addition, most of the published research has focused on obstetrics and neonatal aspects^(18,21,22). In some studies, only teenagers with premarital pregnancies were included^(19,23). Hence, studying this issue using local data is imperative. Identifying factors that may affect unmarried mothers' decision to abandon their infants is beneficial to addressing this alarming issue. The authors hypothesised that an association exists between maternal factors, male partner characteristics, obstetrics variable and unmarried mothers' decision to abandon their infants. Thus, the objectives of this study were to determine the rate and predictors of infant abandonment among unmarried mothers in a major public hospital in Kedah State, Malaysia.

Materials and Methods

Participants and study design

This retrospective study was conducted at the Hospital Sultan Abdul Halim. This government-funded tertiary hospital registers 7,000–9,000 newborns annually, equivalent to 25–40 per day. Additionally, this site is a referral birthing centre that caters to the needs of the mixed urban–rural population in the southern part of Kedah state. For this study, the designation of 'unmarried mother' was determined by the women's marital status at the time of giving birth. The designation for a Muslim mother

was defined as one giving birth without having performed the akad nikah (marriage solemnisation) or when the child was born less than six months after the solemnisation⁽²⁴⁾. For non-Muslims, the designation was defined as a woman giving birth without a formal marriage registration certificate, regardless of whether she lived with her partner or not. All unmarried mothers who gave birth at this centre were included in data analysis. Unmarried mothers who were not Malaysian citizens or delivered stillborns were excluded.

All unmarried mothers giving birth at this centre received standard obstetrics and neonatal care, similar to that provided to other mothers. Before being discharged from the postnatal ward, they were referred to the hospital's Social Welfare Unit, where their plans for themselves and the infants were assessed. One of the questions asked was regarding the mothers' decision of raising the children (unmarried motherhood) or abandoning them (for either adoption or foster care). Information about family background and male partners was also collected and recorded in the patient medical records for future reference. The patients' medical records were kept at the Medical Record Unit upon patient discharge.

Data collection

According to the list provided by the hospital's Social Welfare Unit, 306 unmarried mothers gave birth at this hospital between January 2011 and December 2013. Thirty-one mothers were excluded because they were not Malaysian citizens, and nine were excluded because they delivered stillborns. Accordingly, data analysis was performed among 266 mothers with premarital births. The data of each mother were extracted from their medical records, including age, ethnicity (Malay/non-Malay), educational level (primary/secondary/tertiary), employment status (employed/unemployed), family background (whether parents were divorced or not) and average monthly income. Incomes were presented in Malaysian ringgit (MYR 1 is approximately equal to USD 0.24) and categorised on the basis of the Household Income

Survey of the Department of Statistics, Malaysia⁽²⁵⁾.

Obstetrics information, namely, parity, initiation of antenatal visit (early/delayed), child's gender and mode of delivery (vaginal/instrumental/caesarean delivery) were also obtained. Early antenatal visit was defined as the first visit made to the health clinic within the first trimester of pregnancy⁽²⁶⁾. In addition, we gathered information about the characteristics of the male partners, including age and employment status. We also determined whether the premarital pregnancy resulted from rape. All information was cross-checked with the hospital birth registration records to minimise incomplete data.

Sample size and statistical analysis

Sample size was estimated using the population proportion formulae⁽²⁷⁾. A study by Bachrach et al⁽¹³⁾, indicated that 2% of children born to unmarried mothers were abandoned. If the Type I error probability and precision were 0.05 and 0.05, respectively, and an additional 20% dropout rate was considered, then the sample size needed was 39 samples.

The data was analysed by using IBM SPSS version 20.0 (IBM Corp., Armonk, NY, USA). All the categorical data were presented as frequencies and percentages. Univariable analysis was performed using binary logistic regression, and the decision to abandon the infants was considered the outcome variable. The results were presented as crude odds ratios (ORs) and 95% confidence intervals (CIs). Variables with p value less than 0.25 from the univariable analysis were chosen for multivariable logistic regression analysis⁽²⁸⁾. To identify independent predictors for infant abandonment, we removed the selected variables in a stepwise method at several steps, until only those factors significant at the 0.05 level remained in the final model.

Ethical approval

The study was conducted in compliance with the ethical principles outlined in the Declaration of Helsinki and the Malaysian Good Clinical Practice

Guidelines. No personal information of the participants was disclosed or could be identified in any part of the study. The Medical Research and Ethics Committee of the Ministry of Health, Malaysia, approved this work (NMRR-13-1360-18553).

Results

During the three-year study period, 28, 527 deliveries were recorded, 306 (0.13%) of which were by unmarried mothers. Only 266 medical records were included in the data analysis. Nearly half of

the 266 unmarried mothers included were aged less than 20; the youngest and oldest mothers were aged 14 and 44, respectively. Most of the unmarried mothers were Malay and unemployed, had secondary educational level and an average monthly income of less than MYR 1,000. More than 80% of these women were first-time mothers, and 75.6% attended their first antenatal visit during the first trimester. The infants were equally distributed by gender. Other demographic characteristics are summarised in Table 1.

Table 1. Demographic characteristics of unmarried mothers who gave birth at Hospital Sultan Abdul Halim, Kedah, Malaysia.

Variables	n	(%)
Maternal characteristics		
Age group (years)		
< 20	129	(48.5)
20 – 29	108	(40.6)
≥ 30	29	(10.9)
Ethnicity		
Malay	207	(77.8)
Non-Malay	59	(22.2)
Highest educational attainment*		
Primary	18	(6.8)
Secondary	220	(83.7)
Tertiary	25	(9.5)
Employment status**		
Employed	77	(29.6)
Unemployed	183	(70.4)
Estimated household income (in RM)		
< 1000	151	(56.8)
1000 – 2999	98	(36.8)
≥ 3000	17	(6.4)
Parents ^a divorced		
Yes	17	(6.4)
No	249	(93.6)
Rape-related pregnancy		
Yes	21	(7.9)
No	245	(92.1)

Table 1. Demographic characteristics of unmarried mothers who gave birth at Hospital Sultan Abdul Halim, Kedah, Malaysia. (Cont.)

Variables	n	(%)
Male partner characteristics		
Age group (years)		
< 20	29	(10.9)
20 – 29	180	(67.7)
≥ 30	57	(21.4)
Employment status		
Employed	200	(75.2)
Unemployed	66	(24.8)
Obstetrics information		
Parity		
1	215	(80.8)
2 or more	51	(19.2)
Timing for first antenatal visit		
Early (within 1st trimester)	201	(75.6)
None / Delayed	65	(24.4)
Mode of delivery		
Vaginal	191	(71.8)
Instrumental	12	(4.5)
Caesarean	63	(23.7)
Gender of infant		
Male	131	(49.2)
Female	135	(50.8)

* data missing for 3 cases, ** data missing for 6 cases

n = frequency; % = percent; RM = ringgit Malaysia; a = parent of unmarried mother

Of all the unmarried mothers, 50 (18.8%) decided to abandon their children. Table 2 shows the percentage of unmarried mothers who decided to abandon their infant on the basis of the demographic characteristics. In the univariable analysis, the factors that were found to affect the mothers' decisions included being aged 30 or above and having rape-related pregnancies (Table 3). By contrast, the mothers' ethnicity, educational level, employment status, income level and family background were not associated with their decisions. Unemployed male partners were linked to the abandonment decision. Additionally,

although majority was a first-time mother, it was not a predictor in the women's decision making. In the multivariate analysis (Table 3), the following factors were shown to independently affect the mothers' decisions to abandon their infants: being aged 30 or above (adjusted odds ratio [aOR] 3.33 [95% CI 1.21–9.15]), having rape-related pregnancy (aOR 5.89 [95% CI 2.10–16.53]) and having unemployed male partners (aOR 3.10 [95% CI 1.50–6.39]). Moreover, the influences of having an income of less than MYR 1,000 and more than MYR 3,000 on the mothers' decisions were marginally significant.

Table 2. Percentage of unmarried mothers with decision to abandon their infants at Hospital Sultan Abdul Halim, Kedah, Malaysia.

Variables	Decision to abandon the infant	
	Yes, n (%)	No, n (%)
Maternal characteristics		
Age group (years)		
< 20	23 (17.8)	106 (82.2)
20 – 29	17 (15.7)	91 (84.3)
≥ 30	10 (34.5)	19 (65.5)
Ethnicity		
Malay	40 (19.3)	167 (80.7)
Non-Malay	10 (16.9)	49 (83.1)
Highest educational attainment*		
Primary	4 (22.2)	14 (77.8)
Secondary	40 (18.2)	180 (81.8)
Tertiary	6 (24.0)	19 (76.0)
Employment status**		
Employed	13 (16.9)	64 (83.1)
Unemployed	37 (20.2)	146 (79.8)
Estimated household income (MYR)		
< 1,000	32 (21.2)	119 (78.8)
1,000 – 2,999	13 (13.3)	85 (86.7)
≥ 3,000	5 (29.4)	12 (70.6)
Parents ^a divorced		
Yes	2 (11.8)	15 (88.2)
No	48 (19.3)	201 (80.7)
Rape-related pregnancy		
Yes	9 (42.9)	12 (57.1)
No	41 (16.7)	204 (83.3)
Male partner characteristics		
Age group (years)		
< 20	6 (20.7)	23 (79.3)
20 – 29	31 (17.2)	149 (82.8)
≥ 30	13 (22.8)	44 (77.2)
Employment status		
Employed	30 (15.0)	170 (85.0)
Unemployed	20 (30.3)	46 (69.7)

Table 2. Percentage of unmarried mothers with decision to abandon their infants at Hospital Sultan Abdul Halim, Kedah, Malaysia. (Cont.)

Variables	Decision to abandon the infant	
	Yes, n (%)	No, n (%)
Obstetrics information		
Parity		
1	40 (18.6)	175 (81.4)
2 or more	10 (19.6)	41 (80.4)
Timing for first antenatal visit		
Early (within 1 st trimester)	33 (16.4)	168 (83.6)
None / Delayed	17 (26.2)	48 (73.8)
Mode of delivery		
Vaginal	32 (16.8)	159 (83.2)
Instrumental	4 (33.3)	8 (66.7)
Caesarean	14 (22.2)	49 (77.8)
Gender of infant		
Male	24 (18.3)	107 (81.7)
Female	26 (19.3)	109 (80.7)

* data missing for 3 cases, ** data missing for 6 cases

n = frequency; % = percent; RM = ringgit Malaysia; a = parent of unmarried mother

Table 3. Univariable and multivariable analysis of unmarried mothers with decision to abandon their infants at Hospital Sultan Abdul Halim, Kedah, Malaysia.

Variables	Crude OR (95% CI)	p value	Adjusted OR (95% CI) ^b	p value
Maternal characteristics				
Age group (years)				
< 20	1.16 (0.59, 2.31)	0.669	0.93 (0.44, 1.99)	0.859
20 – 29	1.00 (ref.)		1.00 (ref.)	
≥ 30	2.82 (1.12, 7.10)	0.028	3.33 (1.21, 9.15)	0.020
Ethnicity				
Malay	1.17 (0.55, 2.52)	0.681		
Non-Malay	1.00 (ref.)			
Highest educational attainment*				
Primary	1.27 (0.40, 4.11)	0.672		
Secondary	1.00 (ref.)			
Tertiary	1.23 (0.47, 3.22)	0.678		

Table 3. Univariable and multivariable analysis of unmarried mothers with decision to abandon their infants at Hospital Sultan Abdul Halim, Kedah, Malaysia. (Cont.)

Variables	Crude OR (95% CI)	p value	Adjusted OR (95% CI) ^b	p value
Employment status**				
Employed	1.00 (ref.)			
Unemployed	1.20 (0.59, 2.40)	0.610		
Estimated household income (MYR)				
< 1,000	1.76 (0.87, 3.55)	0.115	2.03 (0.93, 4.42)	0.076
1,000 – 2,999	1.00 (ref.)		1.00 (ref.)	
≥ 3000	2.72 (0.82, 9.00)	0.100	3.57 (0.96, 13.24)	0.057
Parents ^a divorced				
Yes	1.00 (ref.)			
No	1.79 (0.40, 8.10)	0.449		
Rape-related pregnancy				
Yes	3.73 (1.48, 9.43)	0.005	5.89 (2.10, 16.53)	0.001
No	1.00 (ref.)		1.00 (ref.)	
Male partner characteristics				
Age group (years)				
< 20	1.25 (0.47, 3.34)	0.650		
20 – 29	1.00 (ref.)			
≥ 30	1.42 (0.69, 2.95)	0.346		
Employment status				
Employed	1.00 (ref.)		1.00 (ref.)	
Unemployed	2.46 (1.28, 4.73)	0.007	3.10 (1.50, 6.39)	0.002
Obstetrics information				
Parity				
1	0.94 (0.43, 2.03)	0.869		
2 or more	1.00 (ref.)			
Timing for first antenatal visit				
Early (within 1 st trimester)	1.00 (ref.)		1.00 (ref.)	
None / Delayed	1.80 (0.93, 3.51)	0.083	1.86 (0.89, 3.90)	0.101
Mode of delivery				
Vaginal	1.00 (ref.)		1.00 (ref.)	
Instrumental	2.48 (0.71, 8.75)	0.157	3.40 (0.88, 13.08)	0.075
Caesarean	1.42 (0.70, 2.87)	0.330	2.03 (0.92, 4.48)	0.081
Gender of infant				
Male	1.00 (ref.)			
Female	1.06 (0.58, 1.97)	0.845		

* data missing for 3 cases, ** data missing for 6 cases, n = frequency; % = percent; CI = confidence interval; OR = odds ratio; ref. = reference group; MYR = Malaysian ringgit, a = parent of unmarried mother, b = Enter method for multiple logistic regression model was applied. Adjusted for maternal age group, household income, rape-related pregnancy, male partner employment status, timing for first antenatal visit and mode of delivery.

Discussion

The rate of unmarried mothers who decided to abandon their infants found in our study was 18.8% (50/266), or nearly 1 in 5 premarital birth cases. This value was higher than that in a previous survey⁽¹³⁾, thereby indicating that the issue of infant abandonment among unmarried mothers requires increased attention from local authorities. According to the study analysis, the pertinent variables that can be used to predict decisions on infant abandonment include the mother's age, rape-related pregnancy and employment status of the male partner. Our study revealed that women 30 years old or above were likely to abandon their children. Even after adjusting for other factors in the model, unmarried mothers in this age group were still found to be 3.3 times more likely to abandon their infants in comparison with women from other age groups. To date, existing research on the association between mother's age and the decision to abandon has yielded contradictory findings⁽¹¹⁻¹³⁾. Old unmarried women are likely to abandon their children because they may receive less family support in childcare and financial assistance than do young unmarried mothers. The decision to abandon an illegitimate infant for adoption requires a complex evaluation process, including the consideration of the child's future needs^(13,14). Thus, old unmarried mothers who are relatively psychologically mature are more likely to opt for infant abandonment than their young counterparts.

Rape-related pregnancy influences a mother's decision to abandon her child^(6,15), and our study confirms this effect. Many possible reasons exist for making such a decision. After the traumatic experience of being raped, a pregnancy and birth that are beyond a woman's control can be additionally challenging events. In a qualitative study on ten women who were raped before their first childbirth, the women cited that the rape events flashed through their minds during childbirth⁽²⁹⁾. Besides, the newborns can remind the mothers of the rape perpetrators. Additionally, women with a history of sexual trauma are 12 times more likely to experience traumatic childbirths than those without such experiences⁽³⁰⁾. With such a high level of stress, a child born to a mother who has experienced rape is

likely to be abandoned for adoption. Fear of social stigma or rejection by their own family may also affect the mothers in choosing not to raise an illegitimate child.

The present study also found that the employment status of the male partners independently influence mothers' decision on infant abandonment. Raising a child alone requires various life adjustments for an unmarried mother, particularly with respect to financial aspects⁽³¹⁾. Having an unemployed partner may increase the financial burden, especially if the woman is also unemployed. Thus, unmarried mothers may see adoption as a good choice for the children's development and future needs. However, we were unable to investigate further the influences of partner-related characteristics on the mothers' decisions because of limited information provided by the mothers about their male partners, particularly educational level, family background and socioeconomic status. This gap warrants further studies in future.

The results of this study provided necessary information for healthcare providers about the characteristics of unmarried mothers who were likely to abandon their infants. As recommended by the American College of Obstetricians and Gynecologists⁽³²⁾, healthcare providers are responsible for educating these mothers on the options available. Although abandonment of illegitimate infants is not technically a medical matter, healthcare providers, especially those who deal with antenatal and postnatal care, must equip themselves with knowledge on infant abandonment among unmarried mothers. These mothers may need information and advice about their options from healthcare staff after giving birth. Failure to assist these women places children at risk of abandonment after the mother is discharged from the hospital. A counselling session during antenatal visit follow-ups for unmarried mothers may be particularly useful. With our findings, unmarried mothers at risk of infant abandonment can be identified early during pregnancy and thus provided support. Guidance and information at the early stage of pregnancy can help mothers make the best decisions for themselves and their children. Involvement of professionals with relevant expertise, including the NRD and the Department of Social

Welfare, is also essential to supporting mothers with the difficult decision of infant abandonment beyond hospital care.

Several limitations were identified in this study. First, the data collected were sampled from a single hospital, thereby limiting the generalisation of the study findings. Unmarried mothers may have delivered at nearby private hospitals; hence, their birth information was not obtained by this study. Nevertheless, the large study sample size and the mixed urban–rural population made our data analyses useful to providing insights into this topic. A population-based study would be an appropriate future research approach to generating an improved overview of infant abandonment. Second, the information retrieved was limited only to the period before the mother was discharged from the hospital. No data were available to confirm whether these mothers implemented their decision to abandon their infants after being discharged from the hospital. Following discharge, the influences of close relatives, the mother's mental health and societal perception may change a woman's decision. How these external factors influence mothers' decisions about infant abandonment is an essential area to be explored in future research.

Conclusion

In conclusion, a high proportion of unmarried mothers choose to abandon their infants. This group of mothers requires significant attention from healthcare providers and other local authorities. Maternal age of 30 or above, rape-related pregnancy and having an unemployed male partner were the significant predictors for an unmarried mother to opt for infant abandonment. A multidisciplinary team must assist the mother with decisions not only during hospital care but also for continuous follow-up when she is discharged.

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Potential conflicts of interest

The authors declare no conflict of interest.

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