Journal of Midwifery & Reproductive Health

JMRH.mums.ac.ir

Determinants of Unintended Pregnancy among Women of Reproductive Age in Developing Countries: A Narrative Review

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ARTICLE INFO

Article type:
Original article

Article History:
Received: 28-Apr-2015
Accepted: 15-Oct-2015

Key words:
Contraception
Determinants
Unintended Pregnancy

ABSTRACT

Background & aim: The current population of the world is seven billion, and developing countries account for its 97%. Approximately 210 million pregnancies annually occur worldwide and 75-80 million of them are reported to be unintended. Multiple factors can contribute to unintended pregnancy, which need to be assessed to design interventions reducing the incidence of unintended pregnancies. This study aimed to identify the determinants of unintended pregnancy among women of reproductive age in developing countries.

Methods: This review of the literature was carried out by retrieving articles from various databases such as PubMed, Google scholar, and Science Direct and using mesh terms and phrases including 'unintended pregnancy', 'contraception', and 'determinants of unintended pregnancy'. The reviewed studies included descriptive studies, population council reports, demographic and health survey reports, the United Nations Children's Fund statistics, and the World Health Organization reports.

Results: The most common determinants of unintended pregnancy in the literature were reported under the headings of sociodemographic, socioeconomic, sociocultural, fertility related, contraceptive methods, and access related factors.

Conclusion: Multiple factors can predict unintended pregnancy, and these findings have significant policy implications. Policymakers and healthcare providers can benefit from the evidence on determinants of unwanted pregnancy to design and implement policies and programs that can support couples to have their desired number of children, without facing unnecessary threats to their health. Furthermore, more studies are needed to be done in future to assess the available cost-effective interventions for reducing unintended pregnancy and ultimately, to improve women's and children's health.

Please cite this paper as:
Ali S, Ali SA, Suhail N. Determinants of Unintended Pregnancy among Women of Reproductive Age in Developing Countries: A Narrative Review. Journal of Midwifery and Reproductive Health. 2016; 4(1): 513-521. DOI: 10.22038/jmrh.2016.6206

Introduction

According to the World Health Organization (WHO) and Population Reference Bureau statistics 2015, the current population of the world is just over seven billion and it annually continues to grow by 75 to 78 million people (1-3). Developing countries account for 97% of this growth due to high birth rates and increase in the proportion of young population (4). The population of most developed countries are estimated to decrease by 2050, while there will be an increase in the population of developing countries (5). Asian and African countries will contribute to 90% of the population growth, this high birth rate is due to low use of contraceptives (5).

Worldwide use of modern methods of birth control has increased slightly from 54% to 57% (6); however, contraceptive prevalence

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rates vary widely across the world (6). In developed countries, more than 80% of women in reproductive age group (15-49 years) use contraceptives (5), while this rate is much lower in African (21%) and Asian (67%) countries (5). The relatively high rates of contraceptive prevalence in Asia are driven largely by its abundant usage in China (85%), Iran (79%), Sri Lanka (68%), Japan (54%), India (54%), Bhutan (66 %), and Indonesia (61%). While lower rates have been reported for Pakistan (35%), Afghanistan (23%), Maldives (35%), and Nepal (48%) (7, 8). Low rates of contraceptive usage might be associated with the increase in the number of unintended pregnancies across the world (9). Almost 210 million women become pregnant annually worldwide (5, 10), out of whom, 75-80 million (35.7-38%) women experience unintended pregnancy, and approximately 42-46 (>50%) millions of these unintended pregnancies are terminated (5, 11, 12). It is anticipated that unmet need for contraceptives, growing number of women of reproductive age (15-49 years), and the desire in reduction of family size will globally increase the number of unintended pregnancies to 92 million by 2015 (13, 14).

Pregnancies are classified as intended and unintended pregnancy. Intended pregnancy occurs with the willingness of couples, and is desired at the time of conception, while unintended pregnancy is unwanted and unplanned at the time of conception and is further classified as mistimed and unwanted pregnancy. Mistimed pregnancy occurs in women who wanted a child later on, but they conceived sooner than they had planned, and unwanted pregnancy is defined as the pregnancy happening in women who already have children and do not want any more children (14).

Multiple determinants of unintended pregnancy have been cited in different studies across the world, but these determinants were not studied collectively, particularly in developing countries. Thus, studying determinants of unintended pregnancy is of great importance, which would help to design useful strategies and cost-effective interventions to reduce the burden of unintended pregnancy.

Hence, this review of the literature aimed to identify the determinants of unintended pregnancy among women of reproductive age in developing countries.

Materials and Methods

To conduct this study the research questions and methods were identified, the relevant studies were retrieved and selected, the data were charted, collated, and summarized, and the results were reported.

The relevant and feasible research question was identified after reviewing the literature. The FINER (feasible, interesting, novel, ethical, and relevant) criterion was used to identify the research question for this narrative review.

Extensive literature review was carried out by retrieving articles from various databases such as PubMed, Google scholar, Science direct, World Bank, and WHO websites. The relevant articles were retrieved from the abovementioned databases and websites using the following words and phrases: ‘unintended pregnancy’, ‘mistimed pregnancy’, ‘intended pregnancy’, ‘unmet need’, ‘contraception’, ‘developing countries’, ’determinants’, ‘predictors of unintended pregnancy’, and ‘risk factors of unintended pregnancy’.

The included articles were descriptive, observational, correlational, and comparative studies. In addition, the 2015 World Population Data sheet, Population Reference Bureau statistics 2015, Family Planning Fact Sheet, South East Asia Regional Training Manual, 2015 World Health Organization and World Bank reports, Pakistan Demographic and Health Survey 2012-2013, Population Council report 2013, Demographic Health Survey reports of different countries, United Nations Children's Fund statistics 2015, Multiple Indicator Cluster Survey report 2014, World Health Report 2015, and in-depth analysis of Pakistan Demographic and Health Survey (PDHS) report 2006–2007 were studied. The literature search was completed within six months (January-July 2012) except for a few articles and reports, which were retrieved later on in 2015.

The inclusion criteria for the articles were as follows: studies done in developing countries from 1980 to 2015, written in English language,

reporting data on unintended pregnancies, contraception, family planning, or determinants of unintended pregnancies.

For the purpose of this study, 110 articles, sheets, and reports were reviewed, and finally, 76 out of 110 articles met the inclusion criteria for this review. The remaining 34 articles were excluded from the study. Out of these 34 excluded articles, 20 (59%) were excluded because of not being relevant to the research question; these articles were either explaining the relationship between intimate partner violence or unintended pregnancy or were focusing on the outcome of unintended pregnancy. Moreover, eight (24%) articles discussed the prevention or reduction of unintended pregnancies through providing effective contraceptive measures. Four (12%) articles were excluded as they were from developed countries and mainly from the United States of America, and two (6%) articles were excluded since their main objective was evaluation of the economic costs of unintended pregnancies. The review was extensively done by primary and secondary authors of this study, and the articles were included in the study only if both of the authors agreed. Finally, the data were collated and summarized under different headings in the results section.

Results

Determinants of Unintended Pregnancies

There are different factors predicting unintended pregnancy and studies have reported different determinants for this issue. These factors are divided into sociodemographic, socioeconomic, fertility related, and access related factors (15). The sociodemographic and socioeconomic factors included couple's age, their socioeconomic status, education, occupational status and autonomy of the mother, and residential area (15). The fertility related factors included mother's age at time of marriage, gravidity, parity, and the number of alive sons (16). Finally, the factors related to family planning methods included knowledge about contraceptive methods, the use of contraceptives, awareness about family planning personnel or centers, and accessibility and availability of family planning centers (16).

Sociodemographic and Socioeconomic Factors

Maternal Age

Based on the literature review, women usually experience unintended pregnancy at the extremes of childbearing age (younger and older ages). Studies from Bangladesh, Nigeria, and Vietnam have found that advancing maternal age (14, 17-19) as well as young maternal age are a risk factor for unintended pregnancies.

According to the literature of developing countries, unintended pregnancy is usually observed in socially disadvantaged women (20). In Bangladesh, Nepal, and Pakistan, the likelihood of unintended pregnancy increases in women of lower socioeconomic status (19, 21). Similarly, studies from Ethiopia, Senegal, and India indicated that impoverished women are more likely to experience unintended pregnancies (22, 23). On the other hand, studies done in Tanzania found no significant associations between socioeconomic status of women and unintended pregnancy (24).

Couple's Educational Status

Education has also been considered as one of the important determinants of unintended pregnancy, but there are conflicting data regarding the association between level of education and unintended pregnancy. There is a rarity of literature from developing countries showing positive association between low level of education and unintended pregnancy, while the majority of the studies from Nepal, China, Nigeria, and Vietnam have found no relationship between educational status of women and unintended pregnancy (12, 14, 25).

Findings from Ecuador and Bangladesh indicated that women with primary or secondary school education were more likely to have unintended pregnancy, as compared to women with no education (14, 26). Moreover, partner's education is also considered as an important predictor of unintended pregnancy. The literature on this variable is scarce, but few studies from India and Egypt found a significant positive association between low level of literacy of husband and unintended pregnancy (22).

Occupational Status of Woman

Women's occupational status can be divided into two broad categories of currently working women and women who have never worked in their life for earning purposes. Pakistan Demographic and Health Survey has identified that the women at the two extremes of occupational status (currently working and never worked) have the same pattern of contraceptive use. On the other hand, those women who worked only after marriage were mostly reported to use contraceptives, which is indirectly related to the intention of pregnancy (15). Studies from Egypt did not demonstrate any associations between occupational status of women and unintended pregnancy (27).

Place of Residence

Women living in urban areas are more prone to use contraceptive methods, as compared to those who are living in rural areas. Studies from developing countries such as Nepal have found that women in rural areas experience unintended pregnancies more than those living in urban areas, which might be due to insufficient utilization of contraceptive methods (12). Whereas, the results of studies conducted in India showed that women from urban areas experienced more unintended pregnancies, as compared to those living in rural areas (22). Studies performed in Egypt and Nepal found no significant associations between place of residence and unintended pregnancy (27, 28).

Decision-making power/Autonomy of woman

It was found that women's autonomy is related to unintended pregnancy (19, 29). Studies done in Bangladesh and Nepal indicated that women with low decision-making autonomy are more likely to experience unintended pregnancy (19, 29).

Fertility Related Factors

Age at the Time of Marriage

One of the important predictors of unintended pregnancy is age at the time of marriage. Studies from Nepal and Vietnam indicated that age at the time of marriage is inversely related to unintended pregnancy, which means that as the age at the time of marriage increases, the likelihood of unintended pregnancy decreases (13, 29).

Gravidity

Various studies have reported a positive association between gravidity and unintended pregnancy (12, 29, 30).

Parity

Quite the same as gravidity, parity has a positive association with unintended pregnancy. Studies from Pakistan and Nepal have found that women who have more alive children are more likely to experience unintended pregnancy, as compared to women who have less number of alive children (8, 12).

Total Number of Alive Sons

Studies from Bangladesh and Pakistan have suggested that if a women does not have any alive sons prior to the current pregnancy, she will be less likely to have unintended pregnancy, as compared to the woman who have more sons prior to the current pregnancy (8, 19). Similarly, a study performed in Vietnam found that increased number of alive sons was positively associated with unintended pregnancy (18).

Factors Related to Family Planning Methods

Knowledge and Use of Contraceptives

Knowledge about contraceptives plays an essential role in the use of contraceptive methods, and it is one of the important factors associated with unintended pregnancy (8); however, there are mixed results regarding this variable. Studies from Vietnam, Ecuador, and Nigeria found an inverse association between the use of contraceptives and unintended pregnancy (17, 18, 26). On the other hand, studies done in India and Ethiopia showed a positive relationship between use of contraceptives and unintended pregnancy (22, 28). Findings from Tanzania and Ethiopia showed no relationship between the use of contraceptives and unintended pregnancy (23, 24).

Accessibility of Family Planning Centers

Lack of access to family planning services is considered as a crucial factor contributing to

unmet need and unintended pregnancies, and it is positively associated with unintended pregnancy (8, 9). Access has been measured in different ways, including distance or travel time to family planning outlets, knowing the sources of contraceptives, the number of family planning personnel serving the population, and door-to-door visits by healthcare workers (31). The literature on the knowledge about the sources of contraceptives and the number of family planning personnel serving the population is scarce. Thus, the main access related variables highlighted in the literature are distance or travel time and door-to-door visits by healthcare workers.

Generally, utilization of healthcare services is affected by their accessibility and is defined as a decay effect of the distance on the healthcare service utilization (31-34). The latter explains that distance from the services is inversely proportional to healthcare utilization, that is, as the distance increases from the healthcare facilities, utilization of the services is reduced (31-34). This relationship is further aggravated with poor transportation, particularly in developing countries (34).

Availability of vehicles for visiting any facility is important, especially in rural areas, where distances are relatively longer, roads are of poor quality, and public transportation is rarely accessible (35). The same applies to unintended pregnancy, when women do not have access to family planning services, they would be more likely to experience unmet need and unintended pregnancy (36).

Doorstep Family Planning Services by Health Workers

There is a scarcity of studies on this variable and based on the available literature it was found that door-to-door facilities provided by female healthcare workers at home has no association with unintended pregnancy and evidence regarding this type of predictor is not very conclusive (12). Thus, conducting further studies is recommended to determine the association between doorstep services and unintended pregnancy.

Discussion

In different studies from across developing countries, several predictors have been reported for unintended pregnancy, which call attention to policy implications and designing interventions to reduce the incidence of unintended pregnancy and to improve women's health.

With respect to the sociodemographic factors, women at extremes of childbearing age had experienced unintended pregnancy. These findings could be explained by young women's desire to have some years of inter-pregnancy interval, but due to unmet need for contraceptives, they usually end up with mistimed pregnancies.

On the other hand, advancing age has a positive association with unintended pregnancy. The effect of age on unintended pregnancy can be explained by the fact that as women grow older, they do not want any more children, but due to unmet need for contraceptives these women experience unintended pregnancies (8, 13). Studies conducted in Ecuador, Iran, Nigeria, Vietnam, China, and Bangladesh among married pregnant women, who were in reproductive age group, showed that as women's age advances, the likelihood of unintended pregnancy increases (7, 18).

Moreover, educational status has a mixed effect on unintended pregnancy, and there is no conclusive evidence to make any conclusions regarding the association between education and unintended pregnancy. It has been found that highly educated women have usually more knowledge about the use and benefits of contraceptives, which helps them in family planning. Some studies suggested that the higher women's educational status is, the lower are the chances of unintended pregnancies (14, 21), while some other studies show either no significant association (12, 30, 37) or positive association between educational level and unintended pregnancy (38, 39). In addition, the available literature on husband's education showed that it is an important predictor of unintended pregnancy.

With regard to socioeconomic status of woman, it has been found that low-income women are more likely to experience unintended pregnancy, as compared to affluent ones. A study done in Tanzania found no association between this variable and unintended pregnancy, which

could be because of the different settings or difference in measurement of the socioeconomic variable. Most of the studies calculate this variable after analyzing the proxy variables of socioeconomic status, and few studies measure this variable by asking the income of the household. Categories of this variable (poor, middle and rich) are arbitrary; therefore, the results need to be interpreted cautiously.

Place of residence has mixed effects on unintended pregnancy and some of the previous studies found that women from urban areas are at higher risk of unintended pregnancy, while other some studies found that women from rural area are more at risk of unintended pregnancy. This could be due to different settings or preferences for contraceptive use in rural and urban areas. Moreover, there might be some interaction between place of residence and contraceptive usage, which add together and predict the risk of unintended pregnancy; nevertheless, no studies have assessed the interaction between these two variables.

The literature regarding occupational status of women was not enough to assess its association with unintended pregnancy and more studies are required to study this variable. The available literature from Demographic and Health Surveys found a relationship between occupational status and contraceptive prevalence, but not with unintended pregnancy.

With respect to women's autonomy, men are usually considered as the main decision-makers in developing countries, and they decide when and where woman should seek healthcare (19, 40). Hence, women are often given less power in the male-dominant societies to decide for themselves, and they have to depend on the male partners/relatives for their survival and other life matters. Besides, social norms limit women's freedom to make important decisions (19). In some regions of South Asia, women have substantially lower social status and autonomy than men (41, 42). It has been found that low social status and autonomy seems to be associated with low fertility control (43). Such women are more likely to experience unintended pregnancy (12), as compared to those who have some autonomy (19).

With respect to fertility related factors, age at the time of marriage has been considered as an important determinant of unintended pregnancy. Studies have reported a significant inverse association between age at the time of first marriage and unintended pregnancy (12, 30). This means that the lower the age at time of marriage, the higher is the likelihood of unintended pregnancy. This association might be due to the fact that low age at the time of marriage leads to earlier initiation of sexual intercourse, which exposes women to becoming pregnant several times (44). Previous studies reported significantly higher rates of unintended pregnancy in women marrying at a younger age, as compared to woman marrying later in life (12, 18, 26, 30, 45).

Gravidity and parity were found to be proportional to unintended pregnancy. These variables are closely related with each other and once the women have enough children, the intention for the next pregnancy decreases.

Additionally, women with alive sons were more likely to experience unintended pregnancy, as compared to women with no sons. Male child preference is common in Asian countries, particularly in rural areas (18). Women who have a living male child may be interested in preventing pregnancy for the sake of a longer inter-pregnancy interval, or may no longer desire fertility, but with limited contraceptive use or access, it is possible for this subgroup to experience unintended pregnancy. These findings are consistent with the previous studies (18), and PDHS 2012-2013 data also showed that 60% of the women with three sons did not want to become pregnant any more (8).

Knowledge about contraceptives was suggested to be negatively associated with unintended pregnancy. Various studies found that women who have more knowledge about contraceptives are less likely to experience unintended pregnancy, as compared to those who do not have adequate knowledge about these methods (12). Moreover, the use of contraceptive methods is positively associated with unintended pregnancy. Studies have also found a strong positive association between users of modern contraceptives and unintended pregnancy (14, 26, 46), which can be explained

by the fact that users of these methods might have high expectations about preventing pregnancies; thus, they are more likely to view their pregnancy as unintended.

Lack of access to family planning services is considered as an essential factor contributing to unmet need and unintended pregnancy. Access is defined as the "extent to which an appropriate package of contraceptive methods can be obtained by individuals in a given location" (47). Unintended pregnancy and its negative consequences can be prevented by access to effective contraceptive services. The availability of effective birth control methods, regardless of age or ability to pay, is an essential first step (48), which can be achieved by investing in programs aimed at providing doorstep contraceptive services to women (40). Access to family planning services can be viewed as a multi-dimensional paradigm, which consists of certain important elements, namely, economic, administrative, cognitive, psychological, and geographic accessibility (47). Geographic accessibility is generally defined as "the extent to which family planning service delivery and supply points are located so that a larger proportion of the target population can reach them with an acceptable level of effort (47)." So far, little has been done regarding geographic access to family planning services. Findings from ten countries (Colombia, Dominican Republic, Ecuador, Egypt, Guatemala, Thailand, Togo, Tunisia, Uganda, and Zimbabwe) revealed that distance from family planning services is inversely proportional to contraceptive prevalence rate. This means that as the distance from the family planning facilities increases, the contraceptive prevalence rate decreases among the married women of rural areas (49). The results showed that when the distance from the services is within 0-4 km, 5-14 km, and 15+ km the contraceptive prevalence rate is 36%, 33%, and 31%, respectively (49). Another study conducted in Nepal showed that the respondents who were living near family planning services (<30 min travel distance) experienced significantly much lower unintended pregnancies (38%), as compared to those who resided at farther distances (>1 h travel distance) from the family planning services (54%) (12). Similarly, findings of a study conducted in Bangladesh showed that rural women living 5 miles away from a clinic were less likely to use contraceptives than those living within 3-4 miles away from that clinic (36).

Moreover, the effect of door-to-door visits on contraceptive use and unintended pregnancies is mixed. For instance, in Philippines, the frequency of midwives' visits to a supply point had a significant positive impact on clinical measures of contraceptive prevalence (50). Actual frequency of mobile team visits had a strong effect on the use of intrauterine devices in Indonesia (51). In Egypt, the number of family planning workers had little effect on use the contraceptives, but the actual number of family planning extension workers serving a village made current contraceptive use more likely among women aged over 25 (52). According to Easterlin and colleagues, neither family planning nor medical personnel in Egypt had a significant relationship with contraceptive use and unintended pregnancy (31).

Despite the extensive literature review, there are some limitations to this study. One of the important limitations of this review was that it included all the articles irrespective of time and region as determinants of unintended pregnancy could vary over time. Moreover, different countries might have different predictors and determinants for unintended pregnancy, depending upon the epidemiologic and demographic variations in those particular countries. Another limitation of this review was to include more cross-sectional studies, which might not have shown the causal relations between various determinants and unintended pregnancy. Thus, further studies are required to evaluate the causal association between various determinants and unintended pregnancy.

However, extensive review of the literature, exploring all the possible determinants and predictors of unintended pregnancy, use of a variety of databases, and reviewing and screening the included articles by two of the authors are among the strengths of this study.

Conclusion

Multiple factors can predict unintended pregnancy, and these findings have significant policy implications. Policymakers and

healthcare providers can benefit from the evidence on determinants of unwanted pregnancy to design and implement policies and programs that can support couples to have their desired number of children, without facing unnecessary threats to their health. Furthermore, more studies are needed to be done in future to assess the available cost-effective interventions for reducing unintended pregnancy and ultimately, to improve women's and children's health.

Conflicts of Interest

The authors declare no conflicts of interest.

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