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Determinants of Unwanted Pregnancies Among Pregnant Women Attending Primary Health Care Centres in Kirkuk, Iraq: A Cross-Sectional Study

Shakiri AN[1][ID], Ali SM[1][ID]

[1]*Department of Maternal and Neonate Nursing, College of Nursing, University of Kirkuk, Kirkuk City, Iraq*

Abstract

Objective: This study aimed to determine the prevalence of unwanted pregnancies and examine associated socio-demographic and contraceptive-related factors among pregnant women attending primary healthcare centres in Kirkuk, Iraq, between December 2024 and February 2025.

Methods: A cross-sectional analytical study was conducted involving 500 pregnant women selected through purposive sampling across 20 primary healthcare centres and three hospitals. Data were collected via a structured, pretested questionnaire administered through face-to-face interviews. Descriptive and inferential statistics were performed using SPSS version 27. Statistical significance was set at $p < 0.05$ with a 99% confidence interval.

Results: The prevalence of unwanted pregnancies was 30.4%. Most women in this group were aged 24–29 years, resided in urban areas, and had lower educational and income levels compared to those with planned pregnancies. Despite 82.0% of women with unwanted pregnancies reporting previous contraceptive use, over half (52.0%) relied on withdrawal, and 9.6% used lactational amenorrhea methods with high failure rates. A significant association was found between contraceptive method type, duration of use, and pregnancy intention ($p = 0.003$ to 0.008).

Conclusion: Unwanted pregnancies remain a significant concern in Kirkuk, with a substantial proportion linked to reliance on less effective contraceptive methods. Enhanced access to long-acting reversible contraceptives, improved counselling, and integration of comprehensive family planning education into antenatal care are recommended to reduce unintended pregnancies and support reproductive autonomy.

Keywords: Unwanted pregnancy, Family planning, Contraceptive use, Primary healthcare, Iraq

Plain English Summary

This study looked at how common unwanted pregnancies are among pregnant women in Kirkuk, Iraq, and what factors may be responsible. Researchers surveyed 500 women visiting public healthcare centres and found that 30.4% of them were pregnant with babies they did not plan or want at the time. While most of these women had used birth control in the past, many relied on methods like withdrawal or breastfeeding, which are less reliable and more likely to fail. Women with unwanted pregnancies were often younger, had less education, and came from lower-income households. The study highlights the need for better access to effective family planning options, especially long-acting contraceptives like implants and IUDs. It also suggests that counselling on family planning should be included as part of routine pregnancy care to help women make informed choices and reduce the number of unintended pregnancies in the region.

Correspondence:
Shakir Amina N
Department of Maternal and Neonatal Nursing, College of Nursing
University of Kirkuk
Kirkuk City, Iraq
aminanebil98@gmail.com

Introduction

Unintended pregnancy, defined as a pregnancy that is either mistimed or unwanted at the time of conception, remains a critical global public health challenge. It is associated with a range of adverse outcomes, including maternal morbidity and mortality, poor child health, and negative social and economic consequences for individuals and communities (1, 2, 3). Globally, an estimated 40% of pregnancies are unintended, with nearly half resulting in abortion (4). Despite global advancements in reproductive health, including expanded access to contraception, unintended pregnancy rates remain persistently high in many low- and middle-income countries (LMICs), often due to contraceptive failure, discontinuation, or reliance on traditional methods (3, 5, 6, 7).

In the Middle East and North Africa (MENA) region, recent estimates suggest that unintended pregnancies account for between 15% and 58% of all pregnancies, with notably high rates reported in Yemen (58%), Palestine (38%), Syria, and Algeria (31%) (8, 9). A 2023 report by the World Health Organisation further highlights that regional disparities in access to modern contraception, coupled with sociocultural barriers and limited reproductive health education, significantly contribute to the region's high rate of unintended pregnancies (10).

In Iraq, studies indicate considerable variability in the prevalence of unintended pregnancies, with reported rates ranging from 30% to nearly 40% in different settings. For example, a cross-sectional study conducted in Erbil reported a 39.4% prevalence among pregnant women (11). However, existing research in Iraq has been largely limited in scope, with a lack of detailed examination of the socio-demographic and contraceptive-related factors contributing to unintended pregnancies. Furthermore, little is known about how women in diverse regions, such as Kirkuk, with its unique cultural and socioeconomic context, navigate contraceptive choices and how these choices influence pregnancy intention.

Traditional family planning methods, including withdrawal and calendar-based techniques, remain commonly used across Iraq, often due to misconceptions about modern contraceptives, religious influences, or limited access to family planning services (7, 10). These methods have been linked to higher failure rates, especially when used inconsistently or incorrectly (6). Despite this, few Iraqi studies have comprehensively explored the relationship between contraceptive use patterns and pregnancy intention, nor have they addressed the quality and duration of contraceptive use before conception.

This study addresses these gaps by focusing on Kirkuk, a multi-ethnic urban centre in northern Iraq. It aims to (1) determine the prevalence of unwanted pregnancies among pregnant women attending primary healthcare facilities and (2) examine the socio-demographic characteristics and contraceptive-related factors associated with such pregnancies. Findings from this study are expected to inform family planning policy and interventions tailored to the regional needs and sociocultural dynamics of northern Iraq.

Materials and Methods

Study Design and Setting

This study employed a quantitative, cross-sectional analytical design to investigate the prevalence and determinants of unwanted pregnancies among pregnant women attending prenatal care services. Data collection occurred between December 17, 2024, and February 13, 2025, across 20 Primary Health Care Centres, Azadi Teaching Hospital, Kirkuk General Teaching Hospital, and the Maternity, Gynaecology, and Paediatric Hospital in Kirkuk, Iraq.

A purposive sampling method was used to recruit participants. This approach was chosen to ensure the inclusion of pregnant women across a variety of sociodemographic backgrounds and healthcare settings within Kirkuk. However, it is important to acknowledge that purposive sampling limits the generalizability of findings to the broader population, as the sample may not be fully representative. Potential selection bias was minimised by recruiting from multiple sites and ensuring variability in participant characteristics.

Study Population and Eligibility Criteria

A total of 500 pregnant women participated in the study. Eligible participants were pregnant women of any gestational age attending selected prenatal clinics in Kirkuk; women diagnosed with complex pregnancies such as gestational hypertension, pre-eclampsia/eclampsia, gestational diabetes, or anaemia, based on clinical records or physician assessment; and women who self-reported having previously experienced an abortion due to an unintended pregnancy. The exclusion criteria included pregnant women with a recent miscarriage not associated with a prior unwanted pregnancy and women unwilling or unable to provide informed consent.

It is important to clarify that women reporting abortions were included based on self-reported history, and not on clinical verification, due to the legal and ethical constraints surrounding abortion access in Iraq.

Operational Definition of Unwanted Pregnancy

In this study, an unwanted pregnancy was defined as a pregnancy that was not desired at the time of conception, based on the participant's self-report during the interview. This aligns with definitions used in previous epidemiological research (1, 11).

Data Collection Instruments and Procedures

Data were collected using a structured, interviewer-administered questionnaire developed from a review of existing literature. The instrument consisted of three sections:

Socio-demographic characteristics: age, residence, religion, education, income, family structure, and occupation.

Obstetric history: marital age, age at first pregnancy, number of children, gestational age, gravida, para, history of abortion, mode of last delivery, and interpregnancy interval.

Family planning practices: contraceptive use, type of contraceptive methods used, and duration of use before the current pregnancy.

The questionnaire was pretested on a sample of 30 women (not included in the final analysis) to assess clarity, reliability, and content validity. Modifications were made based on feedback from the pilot study. The final version demonstrated acceptable internal consistency, with a Cronbach's alpha (α) of 0.81.

Data were collected through face-to-face interviews conducted in the participants' native language (Arabic or Kurdish). Interviewers were trained healthcare personnel with experience in maternal health to ensure consistency and minimise interviewer bias. For illiterate participants, the consent process and interview questions were read aloud in full, and verbal informed consent was documented following ethical standards.

Statistical Analysis

Data were analysed using IBM SPSS Statistics version 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise data. Inferential statistics included:

Chi-square test, Fisher's exact test, and Fisher-Freeman-Halton exact test to assess associations between categorical variables.

A 99% confidence interval (CI) was used instead of the conventional 95% CI to reduce the likelihood of Type I error and provide more conservative estimates given the public health implications of the findings.

Binary logistic regression was planned to explore predictors of unwanted pregnancy; however, due to the descriptive scope of the current analysis, this multivariate analysis was not presented in the current manuscript but remains part of the extended study.

A p-value of <0.05 was considered statistically significant, and p < 0.01 was considered highly significant.

Results

Prevalence of Unwanted Pregnancy

A total of 500 pregnant women participated in the study. Among these, 152 women (30.4%) reported that their current pregnancy was unwanted, while the remaining 348 women (69.6%) indicated that their pregnancy was planned. Table 1 presents the distribution of pregnancy intention. In this study, unwanted pregnancy refers to pregnancies that were either mistimed or entirely undesired at the time of conception, based on participants' self-reports.

Table 1. Prevalence of Pregnancy Intention among Participants

Pregnancy Intention	Frequency (n)	Percentage (%)
Planned	348	69.60%
Unwanted	152	30.40%
Total	500	100.00%

Unwanted pregnancy was defined as any pregnancy described by the participant as mistimed or not desired at all at the time of conception.

Socio-Demographic Characteristics

Analysis of socio-demographic characteristics revealed that among the women who reported their pregnancies as unwanted, 61 (12.2%) were within the 24–29-year age group. This group also had a slightly higher mean age (27.5 ± 5.7 years) than their counterparts with planned pregnancies (26.6 ± 5.9 years). Urban residence was predominant among women with unwanted pregnancies, accounting for 128 participants (25.6%), whereas only 11 (2.2%) resided in rural areas. Educational attainment varied across the group: 62 women (12.4%) with unwanted pregnancies had completed only primary education, while 35 (7.0%) had a college-level education.

In terms of economic status and household composition, the average monthly household income among women with unwanted pregnancies was IQD 540,263 ± 453,909. Within this group, 65 women (13.0%) reported an income within the 250,000–749,999 IQD range.

Half of the participants with unwanted pregnancies lived in nuclear families, while the other half belonged to extended family systems. Regarding employment status, 115 women (23.0%) were housewives, and only 29 (5.8%) were employed. Table 2 summarises the socio-demographic characteristics by pregnancy intention.

Table 2: Selected Socio-Demographic Characteristics of Participants by Pregnancy Intention

Variable	Planned (n = 348)	Unwanted (n = 152)	Total (N = 500)
Age 24–29 (n, %)	142 (28.4%)	61 (12.2%)	203 (40.6%)
Urban residence (n, %)	281 (56.2%)	128 (25.6%)	409 (81.8%)
Primary education only (n, %)	142 (28.4%)	62 (12.4%)	204 (40.8%)
Monthly income 250k–749k IQD	152 (30.4%)	65 (13.0%)	217 (43.4%)
Employed (n, %)	73 (14.6%)	29 (5.8%)	102 (20.4%)

Obstetric history
The obstetric history of the participants showed that the average age at first pregnancy among women with unwanted pregnancies was 20.3 ± 3.7 years. Most of these women (94 participants; 18.8%) had experienced their first pregnancy between the ages of 18 and 24. Gravidity and parity were also higher in this group, with mean values of 3.9 ± 2.2 and 2.3 ± 1.7, respectively. A history of abortion was reported by 46 women, representing 9.2% of those with unwanted pregnancies. Interpregnancy intervals averaged 2.89 ± 2.56 years, with the most common range being 1 to 4 years (n = 90; 18.0%). These obstetric indicators are presented in Table 3.

Table 3. Summary of Obstetric History by Pregnancy Intention (Selected indicators)

Indicator	Planned (n = 348)	Unwanted (n = 152)	Mean ± SD (Unwanted)
Age at first pregnancy: 18–24	199 (39.8%)	94 (18.8%)	20.3 ± 3.7 years
Gravidity (mean ± SD)	—	—	3.9 ± 2.2
Parity (mean ± SD)	—	—	2.3 ± 1.7
Prior abortion reported (n)	46 (9.2%)		
Interpregnancy interval 1–4 y	152 (30.4%)	90 (18.0%)	2.9 ± 2.6 years

Contraceptive Use Patterns and Pregnancy Intention
Contraceptive use before conception was reported by a substantial majority of women who experienced unwanted pregnancies. Specifically, 125 out of 152 women (82.0%) indicated that they had used some form of contraception before becoming pregnant, while the remaining 27 (18.0%) had not used any method. Notably, more than half of the contraceptive users in this group, 65 women (52.0%), relied on the withdrawal method, a traditional technique associated with high failure rates. Other methods reported included combined oral contraceptive pills (24 women; 19.2%), lactational amenorrhea method (12 women; 9.6%), progesterone-only pills (9 women; 7.2%), intrauterine devices (9 women; 7.2%), and injectables (3 women; 2.4%). A few participants used condoms (2 women; 1.6%) or contraceptive suppositories (1 woman; 0.8%). The duration of contraceptive use also varied. Among women with unwanted pregnancies who reported prior contraceptive use, 36 (28.8%) had used contraception for less than one year, while 68 (54.4%) had used it for one to three years. Only a small number reported durations longer than three years.
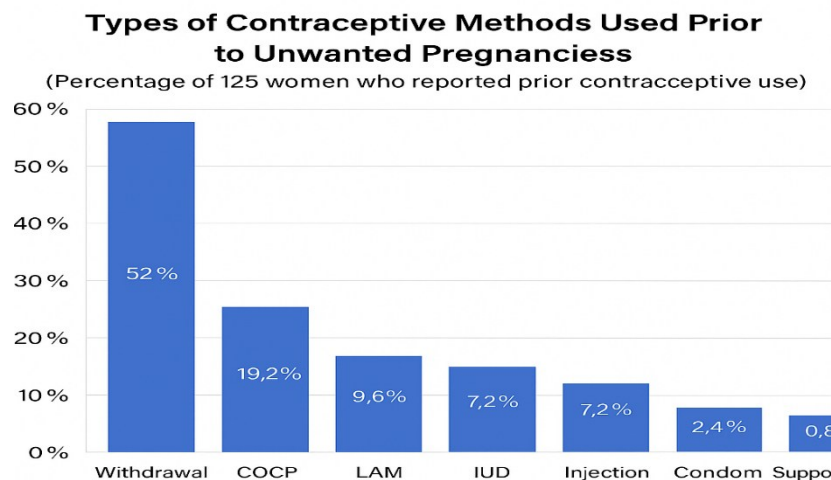
Statistical analysis revealed a significant association between contraceptive use and pregnancy intention. Women who had not used any contraceptive method were more likely to experience unwanted pregnancies (p = 0.003). In addition, both the type of contraceptive method used and the duration of use showed statistically significant associations with pregnancy intention (p = 0.008 and p = 0.005, respectively). Table 4 presents the associations between contraceptive-related variables and the occurrence of unwanted pregnancies. Figure 1 visually summarises the distribution of contraceptive methods used before conception among women who reported unwanted pregnancies.

Table 4: Association between Contraceptive Use and Pregnancy Intention (Unwanted)

Variable	Frequency (n)	Percentage (%)	p-value
Used any contraceptive	125	82.00%	0.003*
Used withdrawal method	65	52.00%	0.008*
Used <1 year	36	28.80%	0.005*

| Did not use any contraception | 27 | 18.00% | — |

p < 0.01 = statistically significant

Types of Contraceptive Methods Used Prior to Unwanted Pregnanciess
(Percentage of 125 women who reported prior contracceptive use)

Figure 1: Types of Contraceptive Methods Used Before Unwanted Pregnancies

Together, these findings suggest a complex relationship between contraceptive behaviour and unintended pregnancy. While most women had attempted to prevent pregnancy, the predominant reliance on less effective methods such as withdrawal and short-term use of contraceptives may have contributed to the high incidence of unintended conceptions observed in this population.

Discussion
This study examined the prevalence and determinants of unwanted pregnancies among pregnant women attending primary healthcare centres in Kirkuk, Iraq. With a reported prevalence of 30.4%, the findings highlight a significant public health concern. Although this rate is slightly lower than that reported in a similar study conducted in Erbil (39.4%) (11), it underscores the ongoing challenge of unintended pregnancies within northern Iraq and raises questions about regional disparities in contraceptive access, cultural practices, and reproductive health education.

Socio-demographic Factors
The study found that women with unwanted pregnancies were slightly older on average and predominantly resided in urban areas. Lower levels of maternal education were also more common among this group. These patterns are consistent with prior studies from Iraq and the broader MENA region, which link lower education and socioeconomic status to increased rates of unintended pregnancy (2, 8, 9, 12). Urban residence, while typically associated with better access to healthcare, may also be accompanied by higher social pressures or unmet contraceptive needs due to gaps in service quality or awareness (1, 10).

Notably, household income levels among women with unintended pregnancies were predominantly in the low-to-lower middle range, aligning with evidence that economic insecurity can increase reproductive vulnerability (13). However, these findings should be interpreted with caution, as the cross-sectional design does not allow for conclusions about causality.

Contraceptive Practices
A striking observation in this study is the paradoxical finding that 82% of women who experienced unwanted pregnancies had used contraceptives before conception. However, over half relied on the withdrawal method, and nearly 10% used lactational amenorrhea. These methods, although widely practised, are known for high failure rates when not strictly and correctly applied (6, 7). The low uptake of long-acting reversible contraceptives (LARCs) and modern methods such as IUDs or injectables may reflect limited availability, misinformation, or cultural and religious hesitancy, as reported in other Iraqi and regional studies (9, 14, 15).

The significant association between short duration of contraceptive use and the occurrence of unwanted pregnancy further reinforces the need to not only promote access but also enhance adherence and method continuation. These findings suggest that interventions must go beyond the distribution of methods to include sustained education and personalised counselling.

Implications and Recommendations
The results of this study point to critical opportunities for public health action. Community-based education programs tailored to both women and their partners could demystify modern contraceptive methods and promote consistent, informed use. Promoting LARCs, such as IUDs and implants, through culturally sensitive messaging could improve uptake and reduce reliance on high-failure methods.

Furthermore, integrating comprehensive family planning counselling into routine antenatal care services may provide an effective platform for reaching women during a receptive period. Strengthening health worker capacity to offer client-centred contraceptive guidance, especially within urban primary care centres, should be prioritised. At the policy level, expanding the availability of subsidised or free modern contraceptives in public facilities across northern Iraq could address accessibility barriers for low-income populations.

Study limitations
Several limitations should be acknowledged. The reliance on self-reported data introduces the potential for social desirability bias, particularly regarding sensitive issues such as abortion and pregnancy intention. Cultural stigma may have led to underreporting of unwanted pregnancies or contraceptive non-use. In addition, the use of a cross-sectional design limits the ability to draw causal inferences between the identified factors and pregnancy intention. The purposive sampling method, while allowing for diversity in recruitment, may restrict generalizability to the broader population.

Conclusion
This study found that 30.4% of pregnancies among women attending primary healthcare centres in Kirkuk were unwanted, with most women relying on less effective contraceptive methods such as withdrawal and lactational amenorrhea. Despite high contraceptive use, poor adherence and method choice contributed to unintended pregnancies. Healthcare providers should prioritise counselling on modern contraceptives, particularly long-acting reversible methods, while policymakers should integrate comprehensive family planning services into antenatal care and strengthen public health education initiatives.

List of Abbreviations
COCP: Combined Oral Contraceptive Pill
IUD: Intrauterine Device
LAM: Lactational Amenorrhea Method
POP: Progesterone-Only Pill
SPSS: Statistical Package for the Social Sciences
WHO: World Health Organisation
MENA: Middle East and North Africa
LARC: Long-Acting Reversible Contraceptive
IQD: Iraqi Dinar

Declaration
Ethics Approval and Consent to Participate
Ethical approval for this study was obtained from the Research Ethics Committee of the College of Nursing, University of Kirkuk. Written authorisation to collect data was also granted by the Kirkuk Health Directorate. Verbal informed consent was obtained from all participants before data collection, and for illiterate participants, the study details were read aloud, and consent was documented in the presence of a witness. All procedures were conducted per the Declaration of Helsinki and local ethical guidelines.

Consent for Publication
All authors have reviewed and approved the final version of the manuscript and consent to its publication under the terms of the Creative Commons Attribution Non-Commercial 4.0 International License.

Availability of Data and Materials
The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

Competing Interests
The authors declare that they have no competing interests.

Authors' Contributions
SAN conceptualised the study, designed the methodology, collected data, and drafted the manuscript. ASM led the statistical analysis, interpreted the findings, and revised the manuscript critically. Both authors read and approved the final manuscript.

References

1. Bearak J, Popinchalk A, Ganatra B, Moller AB, Tunçalp Ö, Beavin C, Kwok L, Alkema L. Unintended pregnancy and abortion by income, region, and the legal status of abortion: estimates from a comprehensive model for 1990–2019. The Lancet Global Health. 2020 Sep 1;8(9):e1152-61. https://doi.org/10.1016/S2214-109X(20)30315-6

2. Black K, Habib MA, Raynes-Greenow C, Bhutta ZA, Nausheen S, Sajid M, Soofi S. Prevalence and determinants of unintended pregnancies amongst women attending antenatal clinics in Pakistan. https://doi.org/10.1186/s12884-017-1339-z

3. Sodeinde K, Osinaike O, Adeniyi-Ebiesuwa A, Oduye A, Ajayi E, Akande B, Ige-Edaba E, Odusanya K, Ogunmoye A, Orafu E, Oyedepo E. Contraceptive Utilization and Perceived Spousal Involvement among Female Employees of Child-bearing Age in a Private University in Ogun State, Nigeria: Utilization and Perceived Spousal Involvement in Contraceptive. Babcock University Medical Journal. 2024 Jun 30;7(1):1-0. https://doi.org/10.38029/babcockuniv.med.j..v7i1.328

4. Bearak J, Popinchalk A, Alkema L, Sedgh G. Global, regional, and subregional trends in unintended pregnancy and its outcomes from 1990 to 2014: estimates from a Bayesian hierarchical model. The Lancet Global Health. 2018 Apr 1;6(4):e380-9. https://doi.org/10.1016/S2214-109X(18)30029-9

5. Samson T, Omoyajowo A, Adeleke O. Contraceptive use and its associated factors in Nigeria: Evidence from during and after COVID-19. Babcock University Medical Journal. 2025 Jul 15;8(1):348-55. https://doi.org/10.38029/babcockuniv.med.j..v8i1.718

6. Polis C, Bradley SE, Bankole A, Onda T, Croft TN, Singh S. Contraceptive failure rates in the developing world: an analysis of demographic and health survey data in 43 countries.

7. World Health Organization. High rates of unintended pregnancies linked to gaps in family planning services: New WHO study. World Health Organization, Geneva, Switzerland. 2019 Oct 25.

8. Mohamed EA, Hamed AF, Yousef FM, Ahmed EA. Prevalence, determinants, and outcomes of unintended pregnancy in Sohag district, Egypt. Journal of the Egyptian Public Health Association. 2019 Mar 13;94(1):14. https://doi.org/10.1186/s42506-019-0014-9

9. Islam N, Mahmood S, Kabir H, Chowdhury SR, Elshaikh U, Alhussaini N, Islam MS, Tania MJ, Chivese T. Prevalence of unintended pregnancy in the MENA region: a systematic review and meta-analysis. BMJ open. 2025 Apr 1;15(4):e084016. https://doi.org/10.1136/bmjopen-2024-084016

10. WHO. Regional estimates of unintended pregnancy and contraceptive prevalence in the Eastern Mediterranean Region. World Health Organization; 2023.

11. Salih RK, Zangana J. A Cross Sectional Study about Unintended Pregnancy among Women in Erbil, Kurdistan Region of Iraq. https://doi.org/10.26655/JMCHEMSCI.2022.2.4

12. Dawood Ahmed S. Depression among Pregnant Women of Displaced Families in Kirkuk Governorate. Kirkuk Journal of Medical Sciences. 2021 Sep 30;3(1):63-71. https://doi.org/10.32894/kjms.2021.169519

13. Musick K, England P, Edgington S, Kangas N. Education differences in intended and unintended fertility. Social forces. 2009 Dec 1;88(2):543-72. https://doi.org/10.1353/sof.0.0278

14. Perappadan BS. Unintended pregnancy puts mother, child at risk: WHO study. The Hindu. 2019 Oct 28 [cited 2024 Dec 20]. Available from: https://www.thehindu.com/news/national/unintended-pregnancy-puts-mother-child-at-risk-who-study/article29816086.ece

15. Yaba Mohammed-Amen H, Mohammed Ali S. Factors influencing modern contraceptive usage among women aged 15-49 years: a cross-sectional study. https://doi.org/10.20473/jn.v19i3.56756