

Original article

Incidence and Risk Factors of Preterm Birth among Women in Tripoli Hospitals, Libya

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Preterm Birth (PTB) is a leading cause of perinatal mortality and long-term morbidity as well as the long-term health consequences and cognitive outcomes. The present study was conducted to determine incidence and risk factors associated with preterm birth in Tripoli, Libya. The study determined the risk factors of preterm birth in Tripoli. A total of 101 cases from Tripoli Hospitals were included in this study. A retrospective study was conducted from July 2021 to October 2021, by using an E-Questionnaire created by google forms which has been distributed online to women who have been through preterm birth, in addition to papered questionnaires distributed on Al-Jalaa' Hospital. Out of 101 cases most of preterm birth were observed in age group between 21 - 30 years old and their weights ranged between 60 kg - 79 kg. we reported that stress 64% ($p = 0.003$), working/standing for a long time 61% ($p = 0.021$) and exposure to pollutants 94% ($p = 0.000$) were the most significant risk factor in PTB. Other factors such as social support 54% ($p = 0.489$) and uterine contractions 58.4% ($p = 0.091$) were less significantly to cause preterm birth. Based on our results, we suggest prompt identification of all risk factors associated with preterm birth to apply immediate and appropriate specific interventions.

Introduction

Preterm Birth (PTB) is defined as delivery before 37 completed weeks of gestation, remains one of the most significant public health challenges globally [1]. Despite advances in maternal and neonatal healthcare, the incidence of preterm birth has not seen substantial reductions in many parts of the world, leading to high rates of neonatal morbidity, mortality, and long-term developmental complications [2]. Preterm birth is responsible for nearly 1 million deaths annually, making it a leading cause of mortality among children under the age of five. Beyond mortality, preterm birth is associated with numerous health issues, including respiratory distress syndrome, brain bleeds, developmental delays, and long-term cognitive or physical impairments [3,4].

The incidence of preterm birth is not uniform globally. According to the World Health Organization (WHO), about 10% of all live births worldwide are preterm, with considerable regional variations [1]. For example, preterm birth rates are higher in low-income countries due to factors like inadequate access to prenatal care, poor nutrition, and limited healthcare infrastructure. In contrast, high-income nations also report significant rates of preterm birth, albeit with better neonatal care facilities that help mitigate some of the complications associated with prematurity [5,6].

Understanding the risk factors associated with preterm birth is crucial for developing targeted interventions and prevention strategies [7]. A wide range of factors, both biological and environmental, contribute to the increased likelihood of a preterm delivery. These factors are complex and often interrelated, with multiple risk factors often present simultaneously in individual women [8]. The recognition of these risk factors allows healthcare providers to identify at-risk pregnancies early and offer appropriate management to reduce the likelihood of preterm birth or improve outcomes for both mother and baby [9].

Globally, the incidence of preterm birth varies from country to country, influenced by numerous determinants, including healthcare infrastructure, socioeconomic conditions, and maternal health. According to WHO estimates, approximately 15 million babies are born preterm each year, and this number is on the rise in some regions, particularly in low- and middle-income countries [1,10]. In the United States, for example, about 9-10% of all births are preterm, a figure that has remained relatively stable over the past several decades. In Europe, preterm birth rates tend to be lower but still significant, with variations between countries reflecting differences in healthcare systems and population health [11,12].

Preterm birth remains a leading cause of neonatal morbidity and mortality globally, with far-reaching consequences for both the infants born prematurely and their families. While the incidence of preterm birth varies by region, the underlying risk factors are well understood and multifactorial, involving a combination

of genetic, biological, social, and environmental influences. Addressing these risk factors, improving access to prenatal care, and implementing public health initiatives aimed at reducing the incidence of preterm birth can significantly reduce both the short-term and long-term impacts on maternal and child health [13,14]. Understanding the complexity of preterm birth is essential for healthcare providers, policymakers, and researchers working to develop effective interventions that can improve outcomes for both mothers and infants. Thus, this study was conducted to determine incidence and risk factors associated with preterm birth in Tripoli, Libya.

Methods

Study design and population

A retrospective study was conducted from July 2021 to October 2021, includes 101 cases from Al-Jalaa' Hospital, Libya.

Data collection

By using an E-Questionnaire created by Google Forms which has been distributed online to women who have been through preterm birth, in addition to papered questionnaires distributed on Al-Jalaa' Hospital. The study is revealed the most factors that appears with premature birth cases.

The questionnaire was divided into three sections, each section was consisting of a number of questions. The first section included general information, the second section questions related to the patient's environment, and the third included questions related to the patient's medical history.

The questionnaire is designed to take no more than 10 minutes to be completed. Furthermore. the survey was conducted in both English and Arabic languages. The questionnaire was distributed to all patients and 15 minutes were given to answer the questionnaire.

Statistical Analysis

Data were entered and analyzed by Microsoft Excel software version 2019 and IBM SPSS Statistics 26. Descriptive statistics were used. Factor appearance proportion tested using a One Sample t Test of Proportions to obtain probability $p < 0.05$.

Results

Out of total 101 cases distributed online and in aljalaa hospital in Tripoli over a period (from July 2021 to October 2021); most of them ranged between 21 and 30 years of age and weights ranged between 60 and 79 kg (Figure 1)

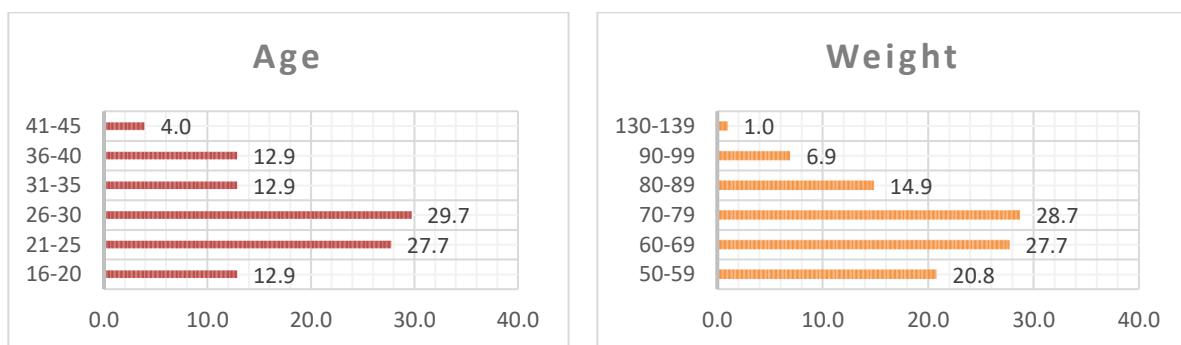


Figure 1. Age and weight of cases

Figure 2-A, showed that most of cases have no domestic violence with 82%, while 10% have emotional violence and 8% have physical violence ($p = 0.000$). Since, approximately half of cases have a social support ($p = 0.489$); as reproted in figure (2-B).

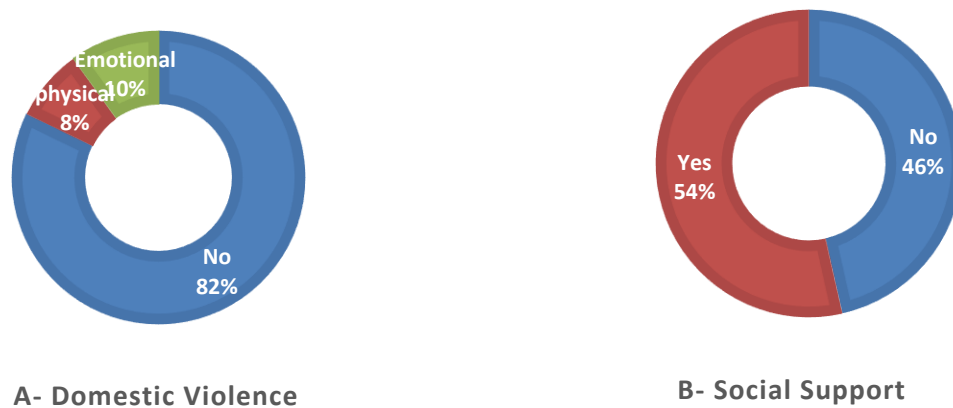


Figure 2. Social status of the included subject

When we asked about getting stressed during pregnancy, nearly 64% ($p = 0.003$) of cases answered with “yes” as revealed in figure (3-A); while 23% ($p = 0.000$) did not receive health care during pregnancy (Figure (3-B)).

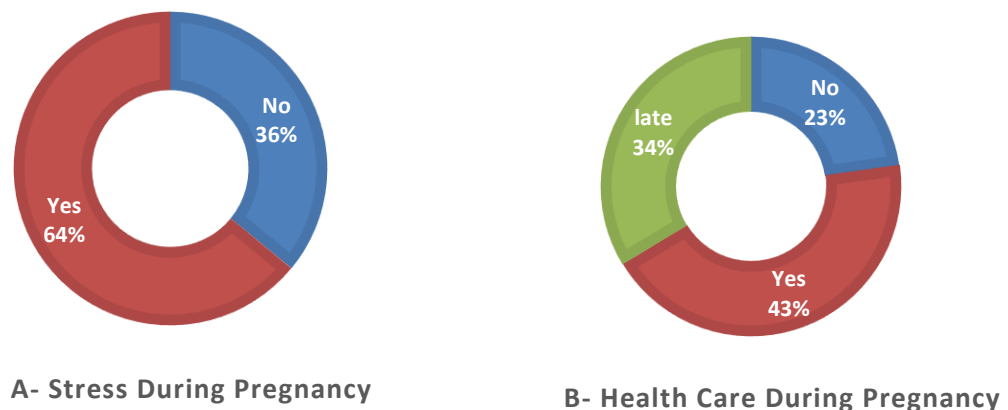


Figure 3. Quires related to stress

Figure 4-A, reported that 61% of cases have worked or stood up for long time during pregnancy ($p = 0.021$), and 94% ($p = 0.000$) of them have exposed for environmental pollutant (Figure 4-B).

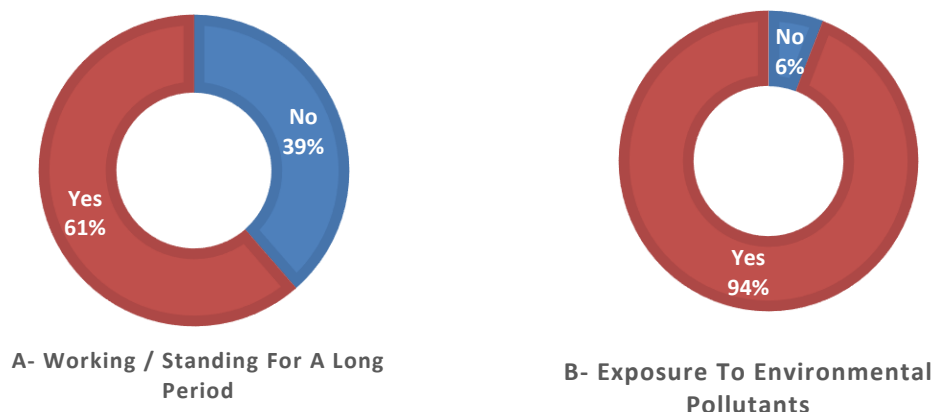


Figure 4. Environmental and social factors

Nearly 60% of cases had infections ($p = 0.000$), more than 50% of them had UTI specifically; while from 12% of cases had deformities ($p = 0.000$) (Figure 5 A&B). Moreover, 18% of cases had chronic diseases ($p = 0.000$) such as; 10% of them was hypertensive, 7% diabetics, and nearly 1% with heart diseases. 75% of cases didn't have Dehydration ($p = 0.000$) (Figure 5 C&D).

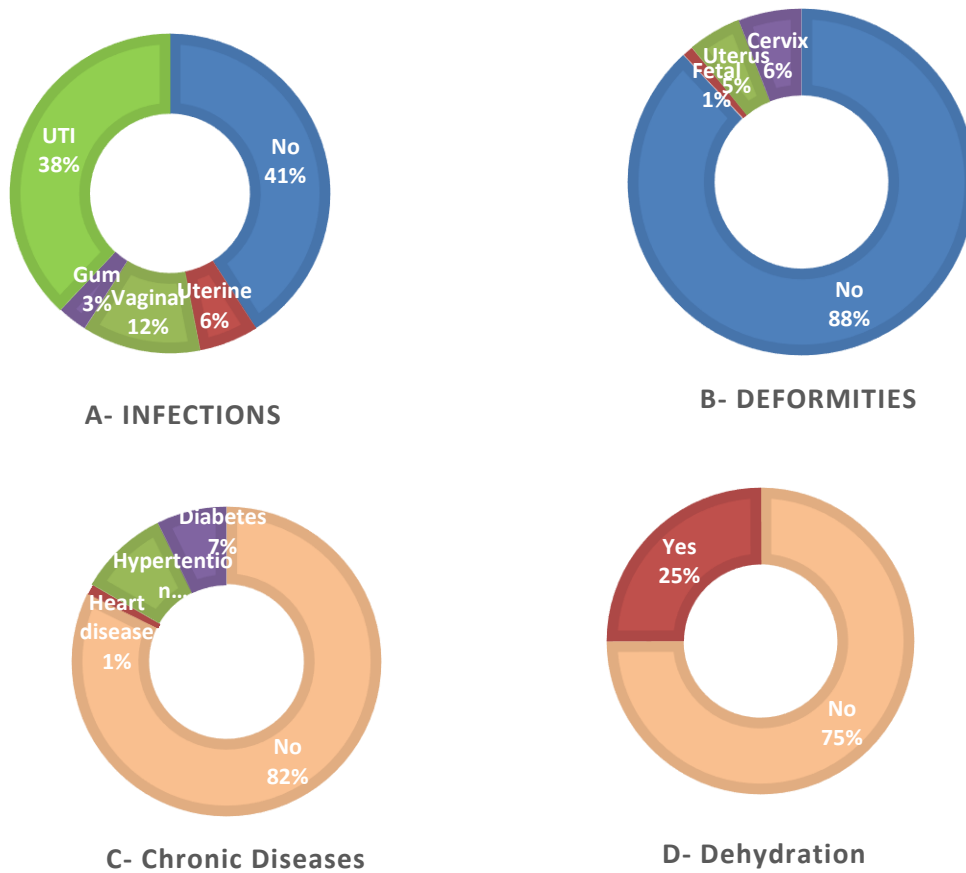


Figure 5. Risk factors

From figure 6, 27% of cases had bleeding during pregnancy ($p = 0.000$), and with no history of preterm ($p = 0.002$).

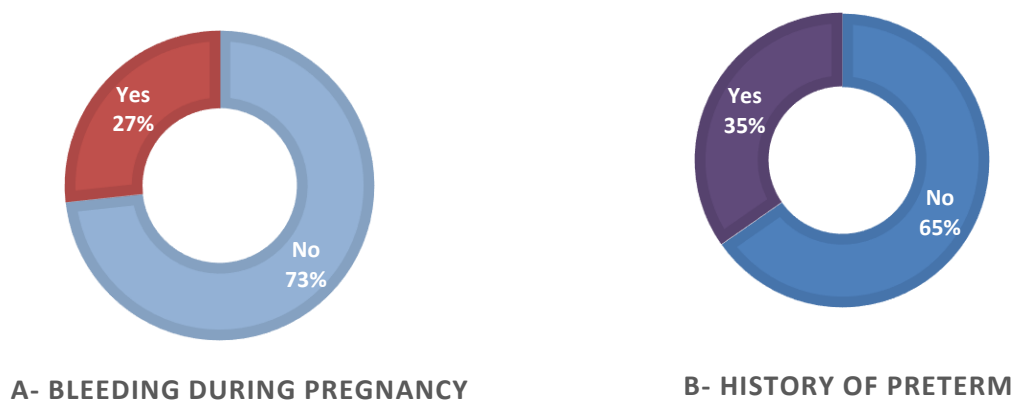


Figure 6. History for preterm birth

About 21% of cases had a short period between pregnancies ($p = 0.000$) and 20% had multiple pregnancies ($p = 0.000$). 96% of them had no vitro fertilization ($p = 0.000$), and about 41% of them has uterine contraction ($p = 0.091$). Meanwhile, only 12% of cases had placenta previa or abruption (Figure 7)

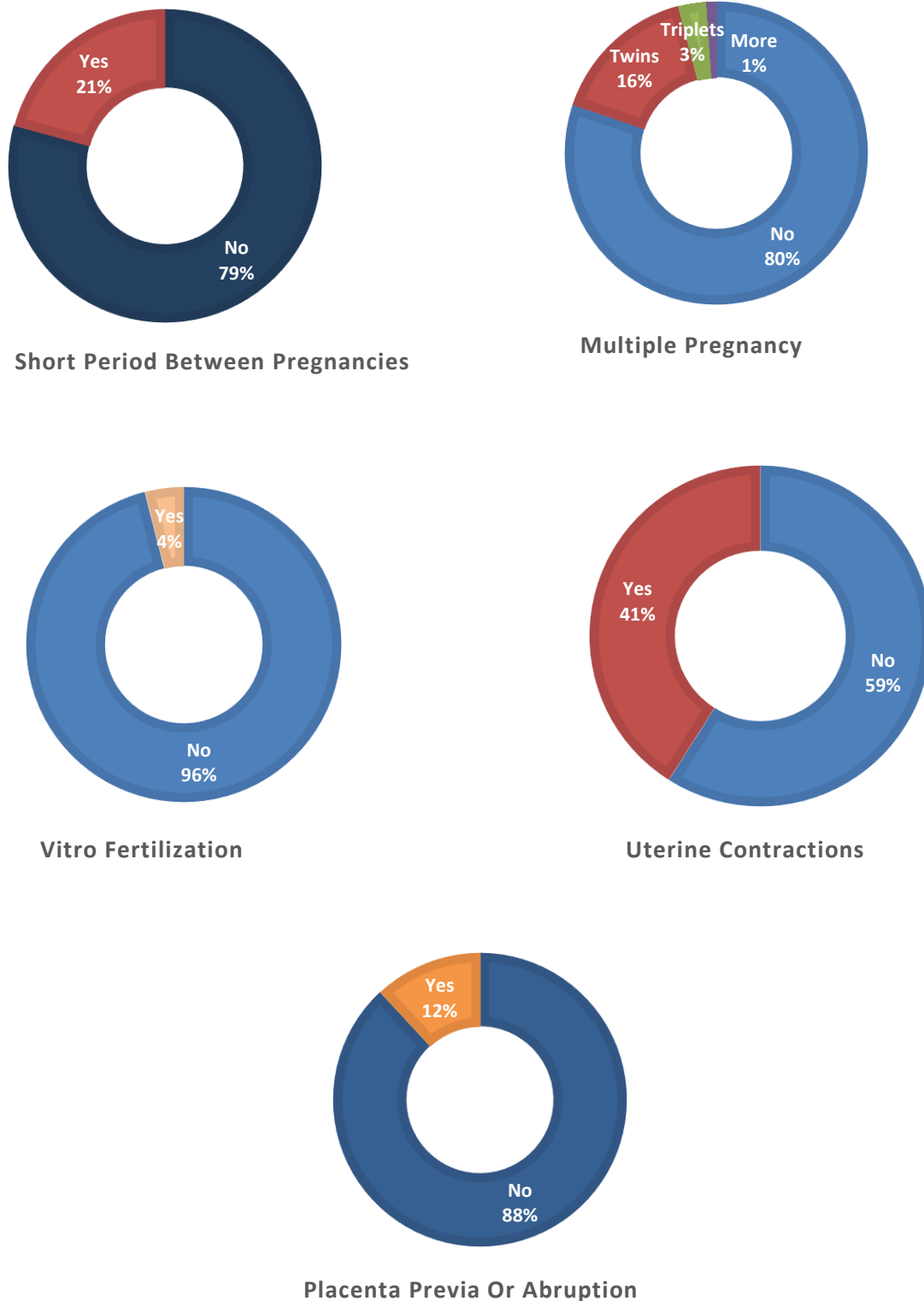


Figure 7. Complication during pregnancy

Discussion

Preterm birth is one of the most important problems in modern obstetric, and it is a leading cause of perinatal mortality and morbidity around the world [15]. This study asserts with numerous previous studies from around the world, in terms of the risk factors of preterm birth. The studies denote that certain factor such as: health care during pregnancy, infections, stress, history of preterm, and many medical and environmental factors contribute in increasing preterm birth. In this study we attempt to list all possible risk factors that lead to preterm birth, and discover the ones with the great impact on this medical phenomenon and that's via the collected data from 101 women with preterm birth [11-15].

As mentioned above, the mean age of women with preterm birth is 27.8 years old. This is close to what was stated in the study of Bekele et al., 2017 [15], where 61% of cases ranged between 25 and 34 years old, whereas its similar to Rao et al. 2014 [16] in which the mean age of mothers was 27.6 years old, in an effort to study the environmental factors, it turns out that 17.8% of cases encountered domestic violence Which is less than the percentage that appeared in Bekele et al, 2017 [15] which was 28.5%. According to the study of Lu et al., 2015 [17], 74% of cases had health care during pregnancy, which agrees with our study. Whereas 77.3% of mothers had health care during pregnancy too. According to studies by Hamad et al, 2007 [18] and Alijahan & Hazarti, 2014 [19] found that 6.5% and 77% have worked hard during pregnancy. That disagrees with this study in which we found that 61.4% of mothers responded that they worked hard during pregnancy.

When it comes to medical risk factors, our study manifested that 59.4% of mothers had infections, and 63% of them had UTI. On the contrary, in the study of Pararas et al., 2006 [20] mentioned that 40% of cases in Germany had infections. According to Bekele et al., 2017 [15] stated that 38% of mothers had UTI, whereas in the study of Rao et al., 2014 [16] 10.4% of cases had UTI and 9.7% had other infections. These percentages were small compared to our case study.

In terms of chronic diseases in this study, 8.9% of cases have hypertension, and 6.9 have diabetes. While in a study by Bekele et al, 2017 [15], 33% of cases have hypertension, and 43% have diabetes which were high scores. On the other hand, a study by Alijahan and Hazarti, 2014 [19], stated that 13% of cases have hypertension and 4.4% have diabetes. Whereas the study of Rao et al., 2014 (16) referred that 21.4% of cases have hypertension and 8.4% have diabetes.

In terms of bleeding in the study of Alijahan & Hazarti, 2014 [19] displayed that 5.6 % of cases had bleeding during pregnancy, while the percentage was 26.7% in this study. Moving to the preterm birth history factor, the percentage was 48.5% of cases who experienced pre term births, according to the study of Bekele et al., 2017 [15], and its 7.2% in Alijahan & Hazarti, 2014 [19]. While the percentage was 34.7% in our study.

Regarding multiple pregnancies, the study of Bekele et al., 2017 [15] showed that 30.3% of cases experienced multiple pregnancies. Whereas, the percentage was 53.9% according to Alijahan & Hazarti, 2014 [19] and with a percentage of 19.8% of cases in this study. Eventually regarding the rapture of uterus, the percentage was 17.5% in the study of Rao et al., 2014 [16] and it's 28.7% according to the study of Alijahan & Hazarti, 2014 [19]. However, in this study we discovered that 6.9% of mothers had rapture of the uterus.

Conclusion

Based on our results, we suggest prompt identification of all risk factors associated with preterm birth to apply immediate and appropriate specific interventions. PTB is a complex phenotype and this report clearly does not suggest that these findings are the answer to all the racial disparity. However, data from these studies provide a foundation and direction for future research in the area of racial disparity. We also recommend, confirming the evidence of other studies that different risk factors may lead to preterm birth. All these procedures could reduce the rate of PTB and the associated neonatal morbidity and mortality.

Conflict of interest. Nil

References

1. Beck S, Wojdyla D, Say L, Betran AP, Merialdi M, Requejo JH, Rubens C, Menon R, Van Look PF. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. *Bulletin of the world health organization.* 2010;88:31-8.
2. Abuagela M, Said A. Using Web-Based Questionnaires for Collecting Data on Risk Factors of Preterm Birth in Tripoli hospitals, Libya. *AlQalam Journal of Medical and Applied Sciences.* 2023 Mar 5:89-94.
3. Asid M, Morgham A, Osman N, Ali K, Meeloud L, Sultan M. Evaluation of Pregnancy Outcome of Placenta Previa in Aljala Maternity Hospital. *AlQalam Journal of Medical and Applied Sciences.* 2021 Sep 13:200-8.
4. Tucker J, McGuire W. Epidemiology of preterm birth. *Bmj.* 2004 Sep 16;329(7467):675-8.
5. Kodama Y, Sameshima H, Ikenoue T. Temporal trends in perinatal mortality and cerebral palsy: A regional population-based study in southern Japan. *Brain and Development.* 2016 Apr 1;38(4):386-91.

6. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. *The lancet*. 2008 Jan 5;371(9606):75-84.
7. Ferré C. Effects of maternal age and age-specific preterm birth rates on overall preterm birth rates—United States, 2007 and 2014. *MMWR. Morbidity and mortality weekly report*. 2016;65.
8. Hollier LM. Preventing preterm birth: what works, what doesn't. *Obstetrical & gynecological survey*. 2005 Feb 1;60(2):124-31.
9. Gee RE, Winkler R. Quality measurement: what it means for obstetricians and gynecologists. *Obstetrics & Gynecology*. 2013 Mar 1;121(3):507-10.
10. Onishi J. Epidemiology and Incidence of Preterm Delivery. *Preterm Labor and Delivery*. 2020:17-25.
11. Boobpamala S, Jindapaisan S, Wanniyom N, Thessawadwong R. Effectiveness of the preterm labor prevention program for high-risk pregnant women: A randomized controlled trial. *Pacific Rim International Journal of Nursing Research*. 2024;28(1):71-87.
12. Van Zijl MD, Koullali B, Mol BW, Pajkrjt E, Oudijk MA. Prevention of preterm delivery: current challenges and future prospects. *International journal of women's health*. 2016 Oct 31:633-45.
13. Suhag A, Reina J, Sanapo L, Martinelli P, Saccone G, Simonazzi G, Giraldo-Isaza M, Potti S, Hoffman MK, Berghella V. Prior ultrasound-indicated cerclage: comparison of cervical length screening or history-indicated cerclage in the next pregnancy. *Obstetrics & Gynecology*. 2015 Nov 1;126(5):962-8.
14. O'Brien JM, Lewis DF. Prevention of preterm birth with vaginal progesterone or 17-alpha-hydroxyprogesterone caproate: a critical examination of efficacy and safety. *American Journal of Obstetrics and Gynecology*. 2016 Jan 1;214(1):45-56.
15. Bekele I, Demeke T, Dugna K. Prevalence of preterm birth and its associated factors among mothers delivered in Jimma university specialized teaching and referral hospital, Jimma Zone, Oromia Regional State, South West Ethiopia. *J Women's Health Care*. 2017;6(1):1-0.
16. Rao CR, de Rooter LE, Bhat P, Kamath V, Kamath A, Bhat V. A Case-Control Study on Risk Factors for Preterm Deliveries in a Secondary Care Hospital, Southern India. *International Scholarly Research Notices*. 2014;2014(1):935982.
17. Lu L, Qu Y, Tang J, Chen D, Mu D. Risk factors associated with late preterm births in the underdeveloped region of China: A cohort study and systematic review. *Taiwanese Journal of Obstetrics and Gynecology*. 2015 Dec 1;54(6):647-53.
18. Abu Hamad KH, Abed Y, Abu Hamad B. Risk factors associated with preterm birth in the Gaza Strip: hospital-based case-control study. *EMHJ-Eastern Mediterranean Health Journal*, 13 (5), 1132-1141, 2007. 2007.
19. Alijahan R, Hazrati S, Mirzarahimi M, Pourfarzi F, Hadi PA. Prevalence and risk factors associated with preterm birth in Ardabil, Iran. *Iranian journal of reproductive medicine*. 2014 Jan;12(1):47.
20. Pararas MV, Skevaki CL, Kafetzis DA. Preterm birth due to maternal infection: causative pathogens and modes of prevention. *European Journal of Clinical Microbiology and Infectious Diseases*. 2006 Sep;25:562-9.

المستخلص

الولادة المبكرة هي أحد الأسباب الرئيسية للوفيات حول الولادة والأمراض طويلة الأمد بالإضافة إلى العواقب الصحية طويلة الأمد والنتائج المعرفية. أجريت الدراسة الحالية لتحديد معدل الإصابة وعوامل الخطر المرتبطة بالولادة المبكرة في طرابلس، ليبيا. حددت الدراسة عوامل الخطر للولادة المبكرة في طرابلس. تم تضمين ما مجموعه 101 حالة من مستشفيات طرابلس في هذه الدراسة. أجريت دراسة بأثر رجعي من يوليو 2021 إلى أكتوبر 2021، باستخدام استبيان إلكتروني تم إنشاؤه بواسطة نماذج جوجل والذي تم توزيعه عبر الإنترنت على النساء اللاتي تعرضن للولادة المبكرة، بالإضافة إلى استبيانات ورقية تم توزيعها على مستشفى الجلاء. من بين 101 حالة، لوحظت معظم حالات الولادة المبكرة في الفئة العمرية بين 21 و 30 عامًا وتراوح أوزانهم بين 60 كجم و 79 كجم. لقد أؤدنا أن الإجهاد بنسبة 64% (ص = 0.003)، والعمل/الوقوف لفترة طويلة بنسبة 61% (ص = 0.021) والتعرض للملوثات بنسبة 94% (ص = 0.000) كانت عوامل الخطر الأكثر أهمية في الإصابة بالسل الرئوي. وكانت عوامل أخرى مثل الدعم الاجتماعي بنسبة 54% (ص = 0.489) وانقباضات الرحم بنسبة 58.4% (ص = 0.091) أقل أهمية في التسبب في الولادة المبكرة. وبناءً على نتائجنا، نقترح التعرف السريع على جميع عوامل الخطر المرتبطة بالولادة المبكرة لتطبيق التدخلات الفورية والمناسبة المحددة.