

POTENTIAL DIFFERENCES IN OCCURRENCE OF PRETERM BIRTHS ACCORDING TO QUALITY OF RELATIONSHIP BETWEEN MOTHERS AND FATHERS OF THE CHILDREN

Nika Konrádyová¹, Kvetoslava Rimárová¹, Jana Diabelková¹, Peter Urdzík², Erik Dorko¹, Štefánia Andraščíková³

¹Department of Public Health and Hygiene, Faculty of Medicine, Pavol Jozef Šafárik University in Košice, Košice, Slovak Republic

²Department of Gynaecology and Obstetrics, Faculty of Medicine, Pavol Jozef Šafárik University and Louis Pasteur University Hospital in Košice, Košice, Slovak Republic

³Department of Midwifery, Faculty of Health Care, University of Prešov, Prešov, Slovak Republic

SUMMARY

Objectives: Premature birth is a serious pregnancy complication that is affected by many biological as well as psychosocial factors. Several studies have shown that a mother's positive relationship with her child's father reduces the mother's stress, anxiety and depression during pregnancy, promotes a healthier mother's lifestyle and thus has a positive effect on pregnancy as such. This research was therefore aimed at identifying possible differences in the incidence of premature births in mothers depending on the quality of the relationship with the father of their child.

Methods: The research involved 210 mothers after childbirth in the period from October 2020 to September 2021. A questionnaire aimed at obtaining descriptive data about the mother and her child and a questionnaire aimed at determining the quality of the relationship – Quality of Relationship Inventory (QRI) were distributed. Mann-Whitney U tests were used to determine differences between groups.

Results: Of 210 children, 44 (21%) were born prematurely, 154 (73.3%) mothers were married and 176 (83.8%) lived with the father of their child in the same household. The results showed that the degree of quality of the mother's relationship with the child's father is approximately the same for mothers who gave birth prematurely and for those who gave birth at term, so there were no differences in this factor between the two groups of mothers.

Conclusion: The results of other researchers have shown the positive impact of partners on pregnancy and the overall well-being of the mothers. However, our research has not confirmed the positive effect of the quality of the relationship between mother and father of her child on reducing the incidence of premature births. Further research is needed to clarify how specifically and whether the quality of the relationship between parents can affect the incidence of premature births at all.

Key words: pregnancy, preterm born children, relationship quality

Address for correspondence: K. Rimárová, Department of Public Health and Hygiene, Faculty of Medicine, Pavol Jozef Šafárik University in Košice, Šrobárova 2, 041 80, Košice, Slovak Republic. E-mail: kvetoslava.rimarova@upjs.sk

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INTRODUCTION

Premature birth (partus praematurus) is a significant complication occurring during pregnancy (1). It is a pathological phenomenon, the causes of which can be endocrinological, biochemical, anatomical and the like, while the pathogenesis of this a syndrome with several aetiological and clinical manifestations has not been elucidated to date (2). Vogel et al. (3) point out that it is primarily a failure of gestation to reach a certain amount of time, so it is not just the presence of specific signs or symptoms.

Premature birth occurs between the 29th and 37th completed gestational week (2, 4–6), or earlier than the 259th day from the date of the mother's last menstrual period (3, 7).

Premature birth is also considered an adverse consequence of pregnancy, as the baby has not been able to complete its intra-

uterine development (3), which has many adverse consequences. The risk of preterm birth lies mainly in the fact that it contributes significantly to morbidity and neonatal mortality (1, 2, 8), while the mortality and morbidity rates are indirectly proportional to the gestational age of the child (4). According to some studies, the neonatal mortality of these children is 35% in neonates and 16% in children under 5 years of age (3).

In addition to mortality, health complications in preterm infants include neonatal respiratory problems, jaundice, hypoglycaemia, enterocolitis, sepsis, neurodevelopmental and neurological problems (periventricular leukomalacia, seizures, intraventricular haemorrhage, hypoxic ischaemic encephalopathy), problems with food intake, vision and hearing problems, impaired motor and cognitive functions (8–10). The latest mentioned is also associated with delayed development and the need for a special pedagogical approach in the future (8).

In the long run, premature babies are more likely to be subject to all kinds of diseases compared to full-term babies. There is increased incidence of respiratory problems such as bronchial asthma, growth retardation, short bowel syndrome, and cerebral palsy (11). These children have a higher number of hospital hospitalizations, behavioural problems, socio-emotional problems, and these health complications represent a significant financial and also psychological burden for the family (7, 8, 12).

Premature births and low birth weight are influenced by multifactorial aetiology (5, 7), so there is a large number of different factors that may be involved. However, their aetiology and mechanisms of action are still unclear, so it is not surprising that up to two-thirds of preterm births are triggered for unknown reasons (3). The most common biological factors include the overall health of the mother and especially her genitourinary system (13–16), the presence of infections – mainly genital (4), diabetes, blood pressure, obesity, anaemia (4, 5, 7, 13–15, 17), mother's age which is too low or too high (5, 7), artificial insemination (3, 12), but also tobacco and drug use before and especially during pregnancy (18).

Biological and health factors are not the only ones that should be addressed in the study of preterm birth (19). In addition, psychosocial factors play an important role, such as the socioeconomic status of the mother and her family (3, 17), marital status, education, whether pregnancy is wanted or unwanted, adverse life events (3), the presence of mental health problems such as epilepsy, bipolar personality disorder, depression, anxiety and stress (16, 19–21), sufficient social support, ethnicity, and the like (19).

Special category is the mother's relationship with her child's father. It has been shown that if there is a positive and intimate relationship between expectant parents, mothers experience less stress during pregnancy and increase their motivation for a proper lifestyle during pregnancy and visits to prenatal counselling (22, 23), which will be reflected in the overall health of the mother and the born child. In addition, men can encourage their partners to reduce their workload during pregnancy, are helpful in preparing for childbirth, and are a source of emotional support (22). Women who have a positive relationship with their partner tend to use alcohol and drugs to a much lesser extent than women who have a conflict with their partner (24). Other positive consequences of the presence of fathers included the mother's readiness for childbirth and active participation and interest in postnatal health care. One of the most significant consequences was the reduction of postnatal depression (23). For this reason, the presence of partners during pregnancy is also recommended by the World Health Organization (22).

As it is proven that a positive relationship between a mother and her child's father has many benefits related to proper lifestyle, health and overall wellbeing of the mother, the aim of this research is to determine whether there is a difference in the incidence of premature births depending on the quality of the relationship between parents.

MATERIALS AND METHODS

Data Collection and Demography

The cross-sectional study was conducted from October 2020 to September 2021. In this study we assessed a group of 210 mothers hospitalized in Louis Pasteur University Hospital in Košice

after labour. Mothers with multiple pregnancies were excluded from the research.

The complex questionnaire was used for data collection. It consisted of two parts. First was focused on collecting demographic data: age, permanent residence of mother, family status, and information about newborn – gestational week, Apgar score, sex, birth weight, and birth length.

Another part of the administered questionnaire was the Quality of Relationship Inventory (QRI). The QRI is a self-report questionnaire that consists of 25 items. Every item is evaluated on a 4-point Likert scale ranging from 1 (not true) to 4 (almost always true). This questionnaire is aimed at assessing the perceived social support of the emotionally closest person, in this case the woman's partner. According to its authors, Pierce et al. (25), there are three subscales in the questionnaire:

- Support (S) – 7 items (presence of the partner when person is in need);
- Conflict (C) – 12 items (the extent to which a relationship is a source of conflict, anger and ambivalent emotions);
- Depth (D) – 6 items (importance of the relationship for an individual, the degree of attachment to the partner and the feeling of security in the relationship).

The individual subscales are evaluated by means of the average point value of the items belonging to them. A higher average value indicates a higher rate for each component of the relationship.

The lowest value of Cronbach's alpha measured for individual subscales was 0.84 (25), which indicates high reliability. The three-factor structure of this questionnaire was also confirmed by Reiner et al. (26). The QRI has proven useful in both clinical and nonclinical research on close relationships (26).

The study was approved by the Ethics Committee of the Louis Pasteur University Hospital, Košice, Slovak Republic. Questionnaires were administered to mothers after labour and fulfilment was purely based on the mothers' voluntariness.

Statistical Analyses

Descriptive statistics were used for description of demographic characteristics of the sample. Due to non-compliance with the conditions for the use of parametric statistics, differences in quality of the relationship of mother with father of the child between mothers with and without premature baby were tested by the Mann-Whitney U test.

All statistical calculations were made with the software SPSS package (Statistical Package for the Social Sciences IBM-SPSS, version 21.0). The level of significance was set at $p \leq 0.05$.

RESULTS

Our sample consists of 210 mothers after labour hospitalized in Louis Pasteur University Hospital in Košice. Average age in our sample was 31.48 years ($SD=4.86$, min. 20, max. 45). All respondents were from region of Eastern Slovakia, concretely 121 mothers were from city of Košice (57.6%), 32 from vicinity of Košice (15.2%), 9 from Prešov (4.3%), 8 from Trebišov (3.8%), 8 from Michalovce (3.8%), 5 from Humenné (2.4%), and the rest from other regions of Eastern Slovakia like Gelnica, Svidník, Levoča, Stará Ľubovňa, Rožňava, Spišská Nová Ves, etc.

Prevalent amount of the mothers – 154 (73.3%) were married (Table 1), 51 were living in cohabitation with father of their child (24.3%), 4 were divorced and living in new relationship (1.9%), and 1 was living without partner (0.5%). From the household point of view, 176 mothers (83.8%) live in one household only with father of their child and probably other children, 17 (8.1%) live with their partner in household of her parents, 14 (6.7%) live with their partner in household of his parents, and 2 (1%) do not live with father of their child. Data from one respondent were missing (0.5%).

The mothers had 210 children in total (multiple pregnancies were excluded from the study sample), 104 were female newborns (49.5%), and 106 male newborns (50.5%). The sample included 44 (21%) of preterm born children, and 166 (79%) children were born on time or later (Table 1). Average gestational week is 38.68 (SD=2.01, min. 25, max. 42).

The QRI was evaluated based on the instruction for use. A score was calculated for each of three dimensions. Table 2 represents descriptive values for these subscales in groups of mothers with and without preterm born child. Statistical means in all three subscales (C, D, S) are confirming very small differences between mothers with preterm born babies versus normal born baby. Data confirmed the highest probability that between these 2 compared groups are no statistical differences. It was also confirmed in the following statistical analysis.

In the next step we analysed the normality of the sample distribution (Table 3). The results confirm that data in selected subscale (C, D, S) do not have normal distribution in both mothers' groups. As shown, none of the samples were normally distributed ($p \leq 0.05$).

As the data were not normally distributed, the basic requirement for the use of parametric statistical procedures was not met,

Table 1. Basic social characteristic of examined sample (N=210)

| | | n | % |
|-----------------------------|------------------------------------|-----|------|
| Marital status of mothers | Married | 154 | 73.3 |
| | Single in relationship | 51 | 24.3 |
| | Divorced | 4 | 1.9 |
| | Single mothers | 1 | 0.5 |
| Household of mothers | Living only with partner | 176 | 83.8 |
| | Living with partner at his parents | 14 | 6.7 |
| | Living with partner at her parents | 17 | 8.1 |
| | Not living with partner | 2 | 1.0 |
| | Missing | 1 | 0.5 |
| Gender of newborns | Female | 104 | 49.5 |
| | Male | 106 | 50.5 |
| Gestational age of newborns | Preterm | 44 | 21.0 |
| | Normal | 166 | 79.0 |

Preterm born: gestational week ≤ 37

Table 2. Descriptive values for subscales of QRI in groups of mothers with and without preterm newborns

| | | Mean (SD) | Minimal value | Maximal value |
|-------|------------------|--------------|---------------|---------------|
| QRI-S | Preterm born | 26.44 (2.15) | 19 | 28 |
| | Non-preterm born | 26.21 (2.91) | 11 | 28 |
| QRI-D | Preterm born | 22.65 (1.49) | 19 | 24 |
| | Non-preterm born | 22.23 (2.38) | 7 | 24 |
| QRI-C | Preterm born | 24.67 (6.35) | 17 | 42 |
| | Non-preterm born | 24.10 (5.93) | 12 | 47 |

QRI-S – Quality of Relationship Inventory Support Scale; QRI-D – Quality of Relationship Inventory Depth Scale; QRI-C – Quality of Relationship Inventory Conflict Scale

Table 3. Normality tests for subscales of QRI in groups of mothers with and without preterm newborns

| | | Kolmogorov-Smirnov test | | |
|-------|------------------|-------------------------|-----|---------|
| | | Stat | DF | p-value |
| QRI-S | Preterm born | 0.279 | 34 | <0.001 |
| | Non-preterm born | 0.285 | 143 | <0.001 |
| QRI-D | Preterm born | 0.240 | 34 | <0.001 |
| | Non-preterm born | 0.266 | 143 | <0.001 |
| QRI-C | Preterm born | 0.192 | 34 | 0.003 |
| | Non-preterm born | 0.157 | 143 | <0.001 |

QRI-S – Quality of Relationship Inventory Support Scale; QRI-D – Quality of Relationship Inventory Depth Scale; QRI-C – Quality of Relationship Inventory Conflict Scale

Table 4. Results of Mann-Whitney U tests for dimensions of QRI

| | | n | Mean rank | Mann-Whitney U test | Z test criterion | p-value |
|-------|------------------|-----|-----------|---------------------|------------------|---------|
| QRI-S | Preterm born | 42 | 101.30 | 3,326.5 | -0.039 | 0.969 |
| | Non-preterm born | 159 | 100.92 | | | |
| QRI-D | Preterm born | 42 | 106.74 | 2,846.0 | -1.171 | 0.242 |
| | Non-preterm born | 153 | 95.60 | | | |
| QRI-C | Preterm born | 35 | 94.93 | 2,692.5 | -0.009 | 0.993 |
| | Non-preterm born | 154 | 95.02 | | | |

QRI-S – Quality of Relationship Inventory Support Scale; QRI-D – Quality of Relationship Inventory Depth Scale; QRI-C – Quality of Relationship Inventory Conflict Scale

the Mann-Whitney U test was used to calculate the differences between the groups. Outputs show that there are no differences ($p > 0.05$) in the group of mothers with or without premature born baby according to the quality of relationship with the father of the child (Table 4).

DISCUSSION

Premature birth is a serious pregnancy complication. There are many factors that affect the mother during pregnancy and can lead to premature birth. The main group of such factors consists of biological and health factors. These include, for example, various urogenital lesions and malformations (13–16), infections (4), obesity, anaemia, and high blood pressure (4, 7, 17). Alcohol, tobacco, and drug use can also have a very negative effect on pregnancy and childbirth (18).

Psychosocial factors are a special category of factors that can significantly affect pregnancy (19). Several of them, such as low socioeconomic status, work stress or lack of social support can lead to increased levels of stress, anxiety and to maternal depression (16, 19–21). The use of alcohol, tobacco and drugs is also a negative consequence of such circumstances (18). However, it has been shown that a positive mother-father relationship can lead to the elimination of these potential threats to pregnancy. Several studies have shown that a mother's positive relationship with the child's father has led to a reduction in the mother's experience of stress during pregnancy (22) and a reduction in postpartum depression (23). Loving partners supporting expectant mothers lead to a healthier lifestyle during pregnancy, which resulted in a reduction of the burden that the mother placed on her during pregnancy, a reduction in the consumption of alcohol and other drugs (22), and an increase in attendance at prenatal counselling centres was also a result of partner's support (22, 23). All these factors have resulted in an increase in maternal health, which should transfer into a reduced likelihood of premature births. Therefore, we hypothesized that the quality of the mother's relationship with the child's father may be a factor that affects the incidence of premature births. However, as it turned out, there were no significant differences in the quality of the relationship between the group of mothers who gave birth prematurely and those who gave birth at term ($p > 0.05$). In all dimensions of the Quality of Relationship Inventory, there were no significant differences between mothers in the two groups. It may be because the quality of the relationship was approximately the same in both groups of mothers. This may indicate that the quality of the mother's relationship with the child's father may not provide sufficient support for the mother

and thus protection against preterm birth. Thus, the quality of the partnership may not play a role in preventing preterm birth, but it can play the role of mediator or moderator. These roles of relationship quality should be explored in future research.

One of the reasons why results of this research do not match with the results of previous researches (22–24) could be the size of the sample. Our data was collected over 12 months but due to COVID restrictive measures it was difficult for researchers to recruit more participants. Another problem could be the ratio between mothers who live with or without father of their children. In our sample only two mothers live separately from the child's father. Further research may focus on reduction of this disproportion.

In addition to the quality of the relationship between the partners, the degree of social support she receives from her surroundings can also be a protective factor for the mother. Resilience is another protective factor that protects the mother from the adverse effects of stress. Thanks to this feature, the mother is better able to cope with stressful events in her life, which may include pregnancy. The search for factors that can have a beneficial effect on the mother during pregnancy and thus reduce the risk of premature birth should be the subject of further research.

CONCLUSION

The results of our research study did not confirm the assumption that a positive relationship between mothers and fathers in the family can have a beneficial effect on reducing the incidence of premature births. It turned out that the level of support, conflict, and depth of the relationship with the child's father is approximately equal for mothers who gave birth prematurely and also for those who gave birth at term. However, as a positive relationship with the child's father has been shown to have a beneficial effect on the mother's behaviour during pregnancy and wellbeing, we recommend investigating whether and how this type of relationship can affect not only pregnancy but also the incidence of premature birth.

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Conflict of Interests

None declared

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