

# **Level of knowledge on prematurity and its complications in women seeking care at referral hospitals in Mexico.**

## **brief title**

knowledge on prematurity in women

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## **ABSTRACT**

**OBJECTIVE:** to determine the level of knowledge that women had on risk factors for and complications of prematurity at a referral hospital.

**MATERIALS AND METHODS:** this was a comparative transverse study conducted in 2015, including women seeking care at a referral hospital, dividing this population into four groups: 1. Pregnant,  $n=108$  (37%), 2. Not pregnant,  $n=85$  (29%), 3. Women seeking an ophthalmological appointment for their prematurely born infant,  $n=13$  (5%), and 4. Women with babies in Neonatal Intensive Care Units,  $n=85$  (29%). Inferential statistics with chi-squared and Mann–Whitney  $U$  tests were applied using SPSS ver. 21.0 statistical software package.

**RESULTS:** The population of women in its majority lived in a common-law marriage and had a secondary-school education. Knowledge of neonatal risk factors included smoking,  $n=239$  (82%) alcoholism,  $n=236$  (81%) diabetes,  $n=176$  (61%), hypertension,  $n=210$  (72%), and fever,  $n=123$  (42%). Significant differences among this study groups were found in relation to the following risk factors for and complication of prematurity; alcoholism,  $p=0.001$ ; diabetes,  $p=0.012$ ; the infant's eye problems,  $p=0.004$ ; the infant's language problems,  $p=0.036$ , and retinopathy of the premature infant,  $p=0.027$ . Differences were found on comparing adolescent with older mothers in terms of knowledge of risk factors,  $p=0.000$  and knowledge of long-term prematurity complications,  $p=0.005$ .

**CONCLUSION:** The principal risk factors identified by mothers were smoking, alcoholism, and diabetes. The most frequently referred complications in the prematurely born infant were those that presented at the short term, mainly ocular and language problem complications.

**KEY WORD:** mothers, knowledge, prematurity, users.

## INTRODUCTION

The World Health Organization (WHO) defines a premature or preterm birth as a birth happening before 37 weeks of gestation. Every year, around 15 million premature births happen, that is, more than one in every ten births (1). The prematurity rate globally oscillates between 5% and 18%. In Latin America, 150000 premature births were registered in the year 2010. In Mexico the National Institute of Statistics and Geography registered 2'478,889 births in the year 2013, 7.4% of which were registered (2-4).

The complications in the neonatal term are more frequent for a premature child, and the morbidity and mortality rate are significantly higher in comparison to full term children (5). Complications related to immature organs and systems predominate, from which respiratory problems stand out, followed closely by metabolic, cardiac, digestive and septic problems (6-8).

The number of prematurity related deaths in Mexico has had a decrease; however, an increase has been noted in some states due to the worsening in overall health conditions (9).

The consumption of harmful substances during pregnancy, such as alcohol, tobacco or illegal drugs, are considered as risk factor for a premature birth. The WHO reports the grade of psychoactive substances consumption in 2 billion alcohol consumers, 1.3 billion tobacco smokers and 185 million illegal drug consumers (9-11). In Mexico, according to the last National Addiction Survey (2011), it is estimated that the population between 12.56 years old, presents a tendency of alcohol consumption of 51.4%, 43.4% for tobacco smoking and 1.8% for illegal drugs consumption. (12-14).

Teenage pregnancy and some maternal pathologies present during the gestational term, such as high blood pressure and diabetes, are also associated with premature births (10,15,16). According to the WHO, high blood pressure diseases of the pregnancy affect in about 10% of women, and 10% will develop gestational diabetes; also, patients who present high risk due to obesity and genetic familiar predisposition, will develop gestational diabetes. (17-18).

For the first time in history, the complications of premature birth have surpassed all other complications, ranking as the first cause of child mortality in the world. Of the 6.3 million deaths estimated in children younger than 5 years old worldwide during the year 2013, the complications of

premature birth represented almost 1.1 million causes of death. In total, 35 thousand children die every year in Latin America due to complications of premature birth. Brazil headlines the region, as 9,000 children die each year, followed by Mexico (6,000) and Colombia (3,500) (19).

Another percentage of premature children will develop some type of physical disability, neurological or intellectual, which supposes a big cost for its families and society in general (1).

Among the more frequent pathologies in premature children after birth are respiratory problems, intracranial hemorrhages, sepsis, retinopathy of prematurity, cardiovascular anomalies, digestive and metabolic anomalies. As for short and long term morbidity, patients present risk of cerebral palsy and development retardation, language and learning problems, attention deficit and hearing, motor and vision alterations (20).

Among the most important problems developed by prematurity is the retinopathy of prematurity, vascular disease of multifactorial origin, in which in its late phase causes ocular alterations that result in tractional detachment of the retina, causing irreversible blindness or some grade of visual incapacity at a very early age (21-24).

The attention of maternal-fetal health has as objective the prevention of the maternal complications during the pregnancy, the opportune diagnosis and its adequate attention (25). Familiar planning and a larger empowerment of women, most important teenagers, besides improving the quality of attention before, between and during the pregnancy, can help reduce the rate of premature births (26).

The 2012 National Health and Nutrition Survey proves that the knowledge about contraceptive methods among teenagers has improved, as 90% reported to know some method (27). The knowledge about prematurity problems is fundamental in its prevention and this depends of the educational grade of the mother, before and during the pregnancy period. In Mexico, the National Institute of Statistics and Geography reported in 2013 that a 38% of mothers present middle school educational grade, 21.7% present high school educational grade and 18.6% elementary school educational grade, (28, 29). The objective of this study is determine the level of knowledge that women had on risk factors for and complications of prematurity at a referral hospital.

## **MATERIALS AND METHODS**

A comparative transversal study conducted in the external consultation of the gynecology and obstetrics services, retinopathy of prematurity clinic of the pediatric ophthalmology service and Neonatal Intensive Care Units of the Civilian Hospitals of Guadalajara, Mexico.

### **Selection criteria**

Women in reproductive age whose newborns are hospitalized in the Neonatal Intensive Care Units gave their verbal consent to participate in the study, to answer a poll about their knowledge on prematurity. For its analysis, teenage mothers who were younger than 18 years old considered.

### **Development of the study**

The sample of participating women was divided into 4 groups: I) Group of pregnant women, selected in the prenatal control service of the gynaecology and obstetrics department, II) Group of non-pregnant women selected in the gynaecology service, III) Group of women whose children attended the retinopathy of prematurity clinic of the pediatric ophthalmology service, and IV) Group of women whose children were premature and were hospitalized in the Neonatal Intensive Care Units. A survey was applied to evaluate the knowledge on prematurity in women using the pediatric and obstetric services of the mentioned hospitals. The information was then summarized in a spreadsheet for its later analysis.

### **Evaluation instrument**

The measurement of knowledge about problems related to prematurity was obtained through a questionnaire made with "YES and NO" questions, divided into three sections: 1. Risk factors, 2. Short term complications, and 3. Long term complications. The questionnaire was applied and filled by medical staff trained for this purpose, thus avoiding any confusion when answering it. To every section, every question was awarded a specific score, adding to a total of 10 points. According to the obtained score in the questionnaire, every woman was assigned in a "knowledge group": low (0-3 points), medium (4-7 points) and high (8-10 points).

### **Statistical analysis**

The qualitative variables were analyzed through percentages and frequencies, the quantitative variables were analyzed through means and ranks. Inferential statistics with chi-squared and Mann–Whitney *U* tests. SPSS ver. 21.0 statistical software package.

#### **Ethical considerations:**

The study considered the principles of investigation in human beings established in the Helsinki declaration. According to the Mexican General Health Law, it is considered a no-risk study, and therefore a written consent was not required from the patients; however, verbal consent was requested to answer the survey. The study was evaluated by the Investigation Committee of our institution, and was authorized under the registry Nr. 2015-058.

#### **RESULTS**

A total of 291 participants were divided into 4 groups: 1. Pregnant, *n*=108 (37%); 2. Not pregnant, *n*=85 (29%); 3. Women seeking an ophthalmological appointment for their prematurely born infant, *n*=13 (5%), and 4. Women with children admitted in Neonatal Intensive Care Units, *n*=85 (29%).

The social and demographic characteristics (Table 1) show a similarity in age, most of them married or common law marriage and with a middle school degree.

**Table 1. Social and Demographic characteristics of the patients included in the study about knowledge of neonatal risk factors.**

|                   | Pregnant women<br><i>n</i> =108 | Non-pregnant women<br><i>n</i> =85 | Women seeking an ophthalmological appointment for their prematurely born infant<br><i>n</i> =13 | Women with children admitted in Neonatal Intensive Care Units <i>n</i> =85 |
|-------------------|---------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Age, Mean (range) | 21.5<br>(14-40)                 | 34<br>(13-58)                      | 24<br>(17-40)                                                                                   | 23<br>(16-45)                                                              |
| Marital Status    |                                 |                                    |                                                                                                 |                                                                            |

|                         |         |         |        |         |
|-------------------------|---------|---------|--------|---------|
| Single, n (%)           | 22 (20) | 22 (26) | 2 (15) | 11 (13) |
| Married, n (%)          | 30 (28) | 37 (44) | 7 (54) | 23 (27) |
| Civil union, n (%)      | 55 (51) | 22 (26) | 4 (31) | 50 (60) |
| Divorced/widower, n (%) | 1 (1)   | 4 (5)   | 0 (0)  | 0 (0)   |
| Academic degree         |         |         |        |         |
| Analphabet, n (%)       | 1 (1)   | 3 (4)   | 0 (0)  | 1 (1)   |
| Elementary, n (%)       | 19 (18) | 25 (29) | 4 (31) | 18 (21) |
| Middle school, n (%)    | 51 (47) | 39 (46) | 5 (38) | 40 (48) |
| High school, n (%)      | 31 (29) | 12 (21) | 3 (27) | 21 (25) |
| Higher education, n (%) | 6 (6)   | 0 (0)   | 1 (8)  | 4 (5)   |

Chi-squared to compare proportions and Mann–Whitney U tests to compare means.

Education and knowledge characteristics (Table 2) show that the most known risk factor was tobacco consumptions, while the least known was fever. 55.5% of women knew about the term “prematurity”. The percentage of women that had previously received an explanation on prematurity complications was of 43.1%, and 47.9% of surveyed women was aware that the premature newborn has probabilities of not surviving.

**Table 2. Overall knowledge by sections of risk factors by the whole population of the survey.**

|                            | Population<br>n=290 |
|----------------------------|---------------------|
| Risk factors               |                     |
| Smoking, n (%)             | 239 (82)            |
| Alcoholism, n (%)          | 236 (81)            |
| Diabetes, n (%)            | 176 (61)            |
| High blood pressure, n (%) | 210 (72)            |
| Fever, n (%)               | 123 (42)            |

|                                         |          |
|-----------------------------------------|----------|
| Explanation of complications, n (%)     | 125 (57) |
| Knowledge on mortality rate             |          |
| Newborn <7 months may not live, n (%)   | 139 (48) |
| Newborn <7 months can be healthy, n (%) | 179 (62) |
|                                         |          |

Knowledge of specific risk factors (Table 3) show statistical significant differences ( $p = 0.032$ ); however, the categorized knowledge scores of short and long term problems was very similar between the study groups ( $p=0.577$  y  $p=0.157$  respectively).

**Table 3. Scoring based on knowledge by sections according to the study group of women in different hospital services about neonatal risk factors.**

|                                 | Pregnant women<br>n=108 | Non-pregnant women<br>n=85 | Women seeking an ophthalmological appointment for their prematurely born infant<br>n=13 | Women with children admitted in Neonatal Intensive Care Units n=85 | P value |
|---------------------------------|-------------------------|----------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------|
| Knowledge of prematurity, n (%) | 66 (61)                 | 60 (71)                    | 6 (46)                                                                                  | 29 (35)                                                            | 0.000   |
| Previous premature newborn,     | 0 (0-2)                 | 2 (0-7)                    | 2 (0-3)                                                                                 | 0 (0-5)                                                            |         |

|                                             |          |          |          |          |       |
|---------------------------------------------|----------|----------|----------|----------|-------|
| median (range)                              |          |          |          |          |       |
| Scoring based on knowledge of risk factors  | 6 (0-10) | 8 (0-10) | 6 (2-8)  | 8 (0-10) | 0.032 |
| Low, n (%)                                  | 12 (11)  | 4 (5)    | 1 (8)    | 11 (13)  |       |
| Medium, n (%)                               | 44 (41)  | 21 (25)  | 7 (54)   | 27 (32)  |       |
| High, n (%)                                 | 52 (48)  | 60 (70)  | 5 (38)   | 46 (55)  |       |
| Probable short term scoring, median (range) | 6 (0-10) | 7 (0-10) | 8 (0-10) | 7 (0-10) | 0.577 |
| Low, n (%)                                  | 19 (18)  | 16 (19)  | 1 (8)    | 13 (15)  |       |
| Medium, n (%)                               | 49 (45)  | 28 (33)  | 5 (38)   | 36 (42)  |       |
| High, n (%)                                 | 40 (37)  | 41 (48)  | 7 (54)   | 35 (41)  |       |
| Probable long term scoring, median (range)  | 6 (0-10) | 7 (0-10) | 9 (3-10) | 6 (0-10) | 0.157 |
| Low, n (%)                                  | 27 (25)  | 21 (25)  | 1 (8)    | 27 (32)  |       |
| Medium, n (%)                               | 42 (39)  | 23 (27)  | 4 (31)   | 21 (25)  |       |
| High, n (%)                                 | 39 (36)  | 41 (48)  | 8 (61)   | 36 (43)  |       |

Chi-squared to compare proportions and Mann–Whitney U tests to compare means.

The knowledge of newborn risk factors and main short and long term complications (Table 4) show real differences between the study groups in terms of alcoholism ( $p=0.001$ ), diabetes ( $p=0.012$ ), previous explanation of complications ( $p=0.046$ ), ocular problems ( $p=0.004$ ), language problems ( $p=0.013$ ) and learning problems ( $p=0.036$ ).

**Table 4. Percentage of knowledge on prematurity-related topics in women according to the study groups.**

|                   | Pregnant<br>women<br>n=108 | Non-pregnant<br>women<br>n=85 | Women seeking an<br>ophthalmological<br>appointment for their<br>prematurely born<br>infant<br>n=13 | Women with<br>children<br>admitted in<br>Neonatal<br>Intensive<br>Care Units<br>n=85 | P<br>value |
|-------------------|----------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| Risk factors      |                            |                               |                                                                                                     |                                                                                      |            |
| Smoking, n (%)    | 84 (78)                    | 78 (92)                       | 10 (77)                                                                                             | 67 (80)                                                                              | 0.060      |
| Alcoholism, n (%) | 79 (73)                    | 80 (94)                       | 12 (92)                                                                                             | 65 (77)                                                                              | 0.001      |

|                                           |            |            |            |            |       |
|-------------------------------------------|------------|------------|------------|------------|-------|
| Diabetes, n (%)                           | 57 (53)    | 62 (73)    | 5 (38)     | 52 (62)    | 0.012 |
| High blood pressure, n (%)                | 82 (76)    | 62 (73)    | 9 (69)     | 57 (68)    | 0.655 |
| Fever, n (%)                              | 46 (43)    | 39 (46)    | 3 (23)     | 35 (42)    | 0.488 |
| Previous explanation of complications (%) | 37 (34)    | 40 (47)    | 9 (69)     | 39 (46)    | 0.046 |
| Short term problems                       |            |            |            |            |       |
| Temperature control, n (%)                | 61 (56.48) | 54 (63.52) | 6 (46.15)  | 51 (60.71) | 0.575 |
| Respiratory complications, n (%)          | 95 (87.96) | 76 (89.41) | 10 (76.92) | 76 (90.47) | 0.542 |
| Cerebral bleedings, n (%)                 | 47 (43.51) | 39 (45.88) | 8 (61.53)  | 39 (46.42) | 0.679 |
| Risk of infection, n (%)                  | 84 (77.77) | 66 (77.64) | 11 (84.61) | 66 (78.57) | 0.951 |
| Ocular problems, n (%)                    | 52 (48.14) | 57 (67.05) | 12 (92.30) | 47 (55.95) | 0.004 |
| Cardiac complications (%)                 | 90 (83.33) | 70 (82.35) | 8 (61.53)  | 66 (78.57) | 0.268 |
| Digestive complications, n (%)            | 75 (69.44) | 64 (75.29) | 9 (69.23)  | 57 (67.85) | 0.732 |
| Jaundice, n (%)                           | 69 (63.88) | 56 (65.88) | 9 (69.23)  | 56 (66.66) | 0.697 |
| Long term problems                        |            |            |            |            |       |
| Cerebral palsy, n (%)                     | 54 (50)    | 55 (64.70) | 10 (76.92) | 43 (51.19) | 0.063 |
| Language complications, n (%)             | 67 (62.03) | 65 (76.47) | 10 (76.92) | 45 (53.57) | 0.013 |
| Learning complications, n (%)             | 68 (62.96) | 60 (70.58) | 12 (92.30) | 47 (55.95) | 0.036 |
| Hearing complications, n (%)              | 61 (56.48) | 50 (58.82) | 12 (92.30) | 50 (59.52) | 0.101 |
| Visual complications, n (%)               | 61 (56.48) | 51 (60)    | 11 (84.61) | 59 (70.23) | 0.080 |
| Attention deficit, n (%)                  | 64 (59.25) | 50 (58.82) | 10 (76.92) | 41 (48.80) | 0.192 |
| Motor problems, n (%)                     | 51 (47.22) | 51 (60)    | 7 (53.84)  | 34 (40.47) | 0.078 |
| Retinopathy of prematurity, n (%)         | 7 (6.48)   | 5 (5.88)   | 1 (7.69)   | 15 (17.85) | 0.027 |

Chi-squared to compare proportions

The number of teenage mothers was of 83 (28.6%), while the adult population of the study was of 207 (71.4%). The largest frequency respecting the knowledge category in teenage mothers was of

“medium knowledge”, while in the adult population was of “high knowledge”. This behavior of results was shown in the 3 knowledge groups: Risk factors ( $p=0.00$ ), short term problems ( $p=0.005$ ) and long term problems ( $p=0.12$ ) (Table 5).

**Table 5. Knowledge of risk factors in teenage mothers in the different hospital services.**

|                                       | Low knowledge | Medium knowledge | High knowledge | P value |
|---------------------------------------|---------------|------------------|----------------|---------|
| Knowledge of risk factors             |               |                  |                | 0.000   |
| Teenagers, n=83                       | 12 (14)       | 41 (49)          | 30 (36)        |         |
| Adults, n=207                         | 16 (8)        | 58 (28)          | 133 (64)       |         |
| Knowledge of short term complications |               |                  |                | 0.005   |
| Teenagers, n=83                       | 16 (19)       | 44 (53)          | 23 (28)        |         |
| Adults, n=207                         | 33 (16)       | 74 (36)          | 100 (48)       |         |

|                                      |         |         |         |       |
|--------------------------------------|---------|---------|---------|-------|
| Knowledge of long term complications |         |         |         | 0.120 |
| Teenagers, n=83                      | 20 (24) | 33 (40) | 30 (36) |       |
| Adults, n=207                        | 56 (27) | 57 (28) | 94 (45) |       |

Chi-squared to compare proportions (Fisher's exact test).

## DISCUSSION

The results obtained in this study are comparable to those obtained in a study performed in a Chinese population called "Parental knowledge of prematurity and related issues", which reports an estimate of the knowledge the parents have respecting prematurity problems. (28) That population has a similar grade of knowledge as to the population studied in our study, presenting a 62% knowledge of the main risk factors, 73.8% knowledge of the short term problems and 50.6% of the long term problems. The quoted study was conducted in parents whose children were admitted in Neonatal Intensive Care Units, while our study was conducted in 4 different groups of mothers: 1. Pregnant, 2. Not pregnant, 3. Women seeking an ophthalmological appointment for their prematurely born infant, and 4. Women with children admitted in Neonatal Intensive Care Units; also, a scoring scale was used to determine if the knowledge was a low, medium or high grade.

The presented study allows us to observe the knowledge mothers have about prematurity, depending on the characteristics of each one. The subjects that have greater knowledge about

problems related to prematurity were those whose children needed neonatal ophthalmologic examination, via the attending physician; however, this same group of mothers turned out to have a lower knowledge on other problems, specially the short term complications, subjects that the group of mothers with children admitted in the Neonatal Intensive Care Unit showed to have a higher degree of knowledge, this is probably due to the fact that these children presented some of those complications at birth and were therefore admitted into those services. In the risk factors sections, the group that presented the best result was the group comprised by non-pregnant mothers.

Has been reported in the literature that many parents reported concerns about morbidities that were unsupported by their childrens diagnoses. It has even been reported that most parents adjusted their children incorrectly, observing that those who correctly reported this information are related to abnormal patterns of development, along with growth patterns. (30)

Mayes in his study, argues that parents' fear of neurological deterioration or mental damage in children patients can cause great anxiety, which can hinder their active participation in medical care. This can be useful to alleviate the guilt and anxiety related to the loss of the patient. Likewise, the physical contact of the child with the parents can reduce the tension and anxiety of the parents. It has been established that health professionals can greatly contribute to facilitating the contact of the child and their parents and in this way reduce the anguish. (31)

We could observe that some factors influence both the quantity and quality of the knowledge that a women has about prematurity. The fact that they obtained information about the subject before the survey, or that they have had a premature child prior to the survey, defines the outcome severely. The knowledge score is directly proportional to the age and academic degree of the mother, while the type of family is also very important.

## **CONCLUSION**

The women that proved to have better knowledge on prematurity and its complications, were adult (>18 years old), with a background of a premature child or receiving a previous explanation about the subject. The main risk factors identified by these mothers were: smoking, alcoholism and diabetes. The more known complications were those presented in the short term, mainly ocular and language complications. It is necessary to increase the knowledge of prematurity in the general population, focusing on those that are in a reproductive age, to implement strategies and programs able to prevent premature births.

## **CONSENT**

Consent was obtained from the respondents.

## **ETHICAL ISSUE**

Ethical approval for this study was obtained from the Research and Ethics Committee (REC) of the Hospital Civil Fray Antonio Alcalde, Guadalajara, Jalisco, Mexico.

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

## **BIBLIOGRAPHY**

1. Who.int OMS ¿Qué es un niño prematuro? Internacional. 2015 In: [http://www.who.int/features/qa/preterm\\_babies/es/](http://www.who.int/features/qa/preterm_babies/es/)
2. Who.int OMS. Nacimientos prematuros. Internacional. 2013 In: <http://www.who.int/mediacentre/factsheets/fs363/es/>
3. Instituto Nacional de Estadística y Geografía. Natalidad. México. INEGI 2010. In: <http://www3.inegi.org.mx/sistemas/sisept/Default.aspx?t=mdemo22&s=est&c=17525>
4. Instituto Nacional de Perinatología. Isidro Espinosa de los Reyes. Acciones efectivas ante el reto de la prematuridad. México. 2015. In: <http://www.inper.edu.mx/noticias/2015/006-2015>

5. Miranda-Del-Olmo Héctor, Cardiel-Marmolejo Lino Eduardo, Reynoso Edgar, Oslas Luis Paulino, Acosta-Gómez Yalia. Morbilidad y mortalidad en el recién nacido prematuro del Hospital General de México. Revista médica del hospital general de México. 2003;66(1):22-28.
6. Pérez-Zamudio Rosalinda, López-Terrones Carlos Rafael, Rodríguez-Barbosa Arturo. Morbilidad y mortalidad del recién nacido prematuro en el Hospital General de Irapuato. Bol Med Hosp Infant Mex 2013;70(4):299-303
7. Schonhaut B. Luisa, Pérez R. Marcela, Astudillo D. Julio. Prematuros tardíos: un grupo de riesgo de morbilidad a corto y largo plazo. Revista Chilena de Pediatría. 2012; 83 (3): 217-223
8. Padilla-Muñoz Horacio, et-al. Perfil de morbilidad y mortalidad de la UCINEX del Hospital Civil de Guadalajara Fray Antonio Alcalde del 2005 al 2012. 2014 5(4):182-188.
9. Villanueva-Egan Luis Alberto, Contreras-Gutiérrez Ada Karina, Pichardo-Cuevas Mauricio, Rosales-Lucio Jaqueline. Perfil epidemiológico del parto prematuro. Ginecología y Obstetricia de México 2008;76(9):542-8
10. Calderón-Guillén Juvenal, et-al. Factores de riesgo materno asociados al parto pretérmino. Revista médica del IMSS. 2005;43(4):339-342.
11. WHO int. Management of substance abuse. The global burden. Internacional. 2004 [Acces 10/08/15] In: [http://www.who.int/substance\\_abuse/facts/global\\_burden/en/](http://www.who.int/substance_abuse/facts/global_burden/en/)
12. Comisión Nacional contra las Adicciones. Encuesta Nacional de Adicciones 2011. Alcohol. México. 2011 [Acces 10/08/05]. In: [http://www.conadic.salud.gob.mx/pdfs/ENA\\_2011\\_ALCOHOL.pdf](http://www.conadic.salud.gob.mx/pdfs/ENA_2011_ALCOHOL.pdf)
13. Comisión Nacional contra las Adicciones. Encuesta Nacional de Adicciones 2011. Tabaco. 2011. México. In: [http://www.conadic.salud.gob.mx/pdfs/ENA\\_2011\\_TABACO.pdf](http://www.conadic.salud.gob.mx/pdfs/ENA_2011_TABACO.pdf)
14. Comisión Nacional contra las Adicciones. Encuesta Nacional de Adicciones 2011. Drogas ilícitas. 2011. México. In: [http://www.conadic.salud.gob.mx/pdfs/ENA\\_2011\\_DROGAS\\_ILICITAS\\_.pdf](http://www.conadic.salud.gob.mx/pdfs/ENA_2011_DROGAS_ILICITAS_.pdf)
15. Rodríguez-Domínguez Pedro Lorenzo, Hernández-Cabrera Jesús, Reyes-Pérez Adriana. Bajo peso al nacer. Algunos factores asociados a la madre. Revista cubana de obstetricia y ginecología. 2005;31:5-10
16. Instituto Nacional de Estadística y Geografía. Natalidad. Porcentaje de nacimientos registrados de madres adolescentes (menores de 20 años), 1990 a 2013. México. 2014. In: <http://www3.inegi.org.mx/sistemas/sisept/Default.aspx?t=mdemo28&s=est&c=17527>

17. OMS. Recomendaciones de la OMS para la prevención y el tratamiento de la preeclampsia y eclampsia. 2014. [Acceso 10/08/15] in: [http://apps.who.int/iris/bitstream/10665/138405/1/9789243548333\\_spa.pdf?ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/138405/1/9789243548333_spa.pdf?ua=1&ua=1)
18. Instituto Nacional de Perinatología. Isidro Espinosa De Los Reyes. Diabetes y embarazo. México, 2015. [Acces 10/08/15] In: <http://www.inper.edu.mx/noticias/2015/018-2015/>
19. WHO Int. Nacimientos prematuros es ahora la principal causa de muerte en niños pequeños. 2014. In: [http://www.who.int/pmnch/media/events/2014/wpd\\_release\\_es.pdf](http://www.who.int/pmnch/media/events/2014/wpd_release_es.pdf)
20. Álvarez Mingorance, Pilar. Morbilidad y secuelas de los niños prematuros en edad escolar. España. Universidad de Valladolid. 2009. Disponible en: <https://uvadoc.uva.es/bitstream/10324/113/1/TESIS40-091216.pdf>
21. Zepeda-Romero Luz Consuelo, et-al. Factores de riesgo en la Retinopatía del Prematuro en UCINEX del Hospital Civil de Guadalajara. Revista médica MD. 2014;5 (4): 189-194.
22. Toledo María Josefa, Gauna Carlos Antonio, Clemantel Cristian Esteban, Denegri Lilian Norma. Retinopatía del prematuro. Revista de Posgrado de la Vía Cátedra de Medicina 20016;164:17-19
23. González-Urquidí Osvaldo, de la Fuente-Torres Marco Antonio. Incidencia de retinopatía del prematuro en el hospital Dr. Manuel Gea González. Revista mexicana de oftalmología. 2004;78(1):1-4.
24. Secretaría de salud. Detección, diagnóstico y tratamiento de RETINOPATÍA DEL PREMATURO en el segundo y tercer nivel de atención. México. Secretaría de salud. Actualización 2015
25. Guía de práctica clínica para el Control Prenatal con Enfoque de Riesgo. México: Secretaria de Salud; 2009. In: <http://www.cenetec.salud.gob.mx/interior/gpc.html>
26. Who int. Nacidos demasiado pronto. Informe de acción global sobre nacimientos prematuros. 2012. In: [http://www.who.int/pmnch/media/news/2012/born\\_too\\_soon\\_execsum\\_es.pdf](http://www.who.int/pmnch/media/news/2012/born_too_soon_execsum_es.pdf)
27. Encuesta Nacional de Salud y Nutrición 2015. Resultados nacionales, síntesis ejecutiva. México. 2012. Disponible en: [http://ensanut.insp.mx/doctos/ENSANUT2012\\_Sint\\_Ejec-24oct.pdf](http://ensanut.insp.mx/doctos/ENSANUT2012_Sint_Ejec-24oct.pdf)
28. Ling Z J, Lian W B, Ho S K Y, Yeo C L. Parental knowledge of prematurity and related issues. Singapore medical journal. 2009; 50 (3) : 27011

29. Instituto Nacional de Geografía e Historia. Natalidad. Distribución porcentual de los nacimientos registrados según escolaridad de la madre, 1990 a 2013. México. 2014. In:  
<http://www3.inegi.org.mx/sistemas/sisept/Default.aspx?t=mdemo26&s=est&c=17529>
30. Fletcher L, Pham T, Papaioannou H, Spinazzola R, Milanaik R, Thibeau S. Parental perception of risk associated their premature infant. *Adv Neonatal Care*. 2017;17:306-12.
31. Mayes LC. Child mental health consultation with families of medilally compromised infants. *Child Adolesc phychiatr Clin N Am*. 2003;12:401-21.

