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THE UNDERSTANDING OF STILLBIRTHS AND ITS IMPORTANCE GLOBALLY

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ABSTRACT

Stillbirth occurs worldwide and the rate of incidence changes according to the region. The low-income countries usually have the highest numbers of cases but middle and high-income countries also have significant stillbirth rates. Unfortunately, the situation remains undervalued despite the incidence globally. This literature review has the objective of broadening the understanding of the causes, risk factors, investigations and its distribution of stillbirths so as to achieve approaches to prevent stillbirth and to comprehend the importance globally. The selection of the papers for this review was conducted through some steps. The databases used were mainly PUBMED and JSTOR during the period of 2017 to 2021. 599 papers were initially found but only 12 were eligible for the present review. Research evidenced that stillbirth rates have a disproportion in its distribution worldwide and the understanding of the aspects involved in stillbirth could help prevent the increasing number of cases reported as well as diminish the negative impact which stillbirth brings to society.

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INTRODUCTION

Fetal deaths occur worldwide and can be defined differently depending on the assessed classification. The International Classification of Diseases 11 (ICD) classifies unspecified fetal death as intrauterine death during any period of the pregnancy, and the occurrence after the middle of the second semester as stillbirth (WHO, 2018). It is important to highlight that fetal deaths can be further classified, according to ICD 10, into: early, late and abortion. The first involves fetuses greater than or equal to 500 grams or greater than or equal to 22 weeks of gestation or with 25 cm in length. Late as the ones who weigh equal to or greater than 1000 grams or greater than or equal to 28 weeks of gestation. Abortion addresses fetal loss before completing twenty-second week of gestational age (WHO, 2010). According to the newer recommendations, stillbirths are considered when greater than or equal to 1000 grams or greater than or equal to 28 gestational weeks or body length greater than or equal to 35 cm (WHO, 2016). Furthermore, stillbirth can be divided into antepartum and intrapartum, which the event is considered before the start of labor and after labor, but before birth, respectively. In 2015, 2.6 million fetal deaths were reported worldwide, resulting in 18.4 stillbirths per 1000 births (Lawn *et al.*, 2016). It has been reported in the literature that the death rate, as well as the risk factors vary geographically (Lawn *et al.*, 2016). The prevalence of the incidence of fetal death in

have more than half of stillborn babies in the world, despite the declining rate over the past few years, it remains elevated (Lawn *et al.*, 2016). Seventy-seven percent of the deaths described occurred in the regions of sub-Saharan Africa and Southeast Asia, corresponding to about 2 million of the global number. Worldwide, there has been a 19% reduction from 2000 to 2015 (Blencowe *et al.*, 2016). However, this reduction in deaths is not uniform, as it occurs mainly in developed countries and in smaller populations (Lawn *et al.*, 2016). The investigation of the causes of the stillbirth in several regions can be inconclusive or not explained, so it is possible to use histopathological exams, verbal autopsies, autopsies and additional laboratory or imaging exams for a more profound investigation. Regarding placental histopathology, Man *et al.* (2016), observed that a third of the 946 placentas submitted to evaluation was unchanged and only 32% had abnormal placental changes, such as vascular occlusion, poor maternal vascular perfusion, massive fibrin deposition pervasive and others. In this test, placental abruption is often diagnosed (Man *et al.*, 2016). The complete examination of the stillbirth can be done with an entire autopsy and the use of imaging methods such as computed tomography, radiography and magnetic resonance. Verbal autopsies investigate the factors associated with fetal deaths and analyse information to improve strategies for preventing deaths (Wojcieszek *et al.*, 2018). Although fetal death events in several countries have a high incidence, it still remains undervalued. This review aims to show how fundamental it is to

understand the causes, risk factors, investigation and distribution in order to develop strategies to prevent fetal deaths and diminish its impact on society.

METHODS

Papers selected in this literature review were obtained through some steps. The first step was to search in the literature using bibliographic databases such as PUBMED and JSTOR. The identification of the articles was done by including the following keyword “Stillbirth”. The search strategy through PUBMED database was limited to free text including meta-analysis, randomized controlled trial, review and systematic review in the period from 2017 to 2021 without language restriction. During the same period of time, articles were searched in JSTOR platform containing only review of journals and research reports. The second step was to evaluate abstracts and exclude the ones that did not follow the selection criteria. We excluded articles that diverged from stillbirths and/or were designed mainly for infant or neonatal mortality. In studies with results separated by groups of loss, data related to stillbirth were extracted. After the selection, the papers were analysed in the full version, completing the third step.

RESULTS AND DISCUSSION

This review provides evidence on the distribution, causes, risk factors and investigations associated with stillbirth worldwide. Initially, we found 599 papers but only 27 abstracts were screened in the first moment, 26 were reviewed in full text version and 12 were eligible for the present literature review. In a systematic review by Reinebrant *et al.* (2018), 85 reports were included, analysing 489,089 stillbirths and showing variations in the definition of stillbirth. Those reports were divided into high-income countries (HIC) with 37 cases, middle-income countries (MIC), with 20 cases and low-income countries (LIC) with 28. Only 71 of such reports were defined as stillbirths, in the HIC 78% used a lower gestational age limit of 20-24 weeks and 68% of LIC used 28 weeks (Reinebrant *et al.*, 2018). There are many classification systems for the evaluation of stillbirth in the literature, however, they have been designed to analyze specific populations, increasing the need for different management in each region (Aminu *et al.*, 2017). Overall, papers from 49 countries were reviewed by Reinebrant, *et al.*, (2018) and the classification system used in those countries were the: ICD, clinical classification system and no system, involving in each category 24 papers, 41 and 20, respectively (Reinebrant *et al.*, 2018). Concerning the causes of stillbirth, *congenital anomalies*, *unexplained* and *maternal conditions* were described as the most frequent categories (Reinebrant *et al.*, 2018). The rates vary according to the classification system. In the ICD, the cause with the highest report was *others unspecified condition* (68%), followed by *hypoxic peripartum death* (64%) while in the clinical system, *antepartum haemorrhage* was described with (72%) and *infection* (67%). These causes can be further divided depending on HIC, MIC and LIC. In most countries, *unexplained causes* have the highest rate and in LIC, *infections*, *other unspecified conditions* and *hypoxic peripartum death* represents around 40% of all cases (Reinebrant *et al.*, 2018).

A meta-narrative method, verifying 54 sources, separated the factors associated to different groups. In biological factors, it was identified higher risk of stillbirth in short maternal height, primiparity, grand multiparity, maternal BMI (body mass index), consanguinity, maternal age, birth spacing and gestational age. Clinical factors include diabetes, congenital anomaly, previous stillbirth, pulmonary insufficiency, antepartum haemorrhage, hypertension, placental conditions and IUGR (intrauterine growth retardation) (Kingdon *et al.*, 2019). Risk factors included: Behavioural, late booking, not attending antenatal care, delay in seeking care (reduced fetal movements), poor nutrition, smoking, substance and alcohol abuse. In health services, the location of birth, few midwives, language and cultural barriers can be involved in some cases (Kingdon *et al.*, 2019). In the social factors, black or asian people, recent migrants,

non-English speaking, unmarried, not living with a partner, stress, lower social class, area deprivation, unemployment, domestic abuse could also be one of the associated with factors of stillbirth (Kingdon *et al.*, 2019). Besides, risk factors have been shown in subcategories, as they usually interact with more than one associated factor. In a systematic review, they found 20 studies in South Asia that met the criteria, finding a mean rate of 25.15 [95% CI: 21.75, 28.55] per 1000 births (Poudel *et al.*, 2020). The most frequent risk factors in this review were pregnancy complications, maternal health conditions, fetal complications, lack of antenatal care, and lower Socioeconomic Status (SES) in the different countries of South Asia (Poudel *et al.*, 2020). Even though the following risks factors have a lower rate, premature labor and stillbirth had significant association, daily tobacco consumption >5 times, movements, decreased fetal, history of bleeding during pregnancy, vaginal delivery, history of previous abortion, placenta previa and abruptio placentae, obstructed labour, preterm birth with small for gestational age, hypertensive disorder, loudy or meconium stained fluid and ruptured uterus also have considerable numbers. The relation between lower socioeconomic status and higher stillbirth is well-established and it's in agreement with others studies (Poudel *et al.*, 2020).

It was also shown that advanced maternal age increases risk of stillbirth, having no regional differences through studies including 185,384 stillbirths out of 44,723,207 births (Lean *et al.*, 2017). Muglu *et al.* (2019), in a study reporting 9,291,101 stillbirths also confirmed that the advanced age in pregnant women increased the rate of stillbirth occurrence, ranging from 0.11 per 1,000 pregnancies at 37 weeks to 3.18 at 42 weeks. The risk was reported to be higher over 41 weeks of gestational age (Muglu *et al.*, 2019). A cohort study in Denmark showed the relation between advanced paternal age and stillbirth rate was to be J-shaped when comparing fathers with 32 years old. In this matter, stillbirths occur more with younger fathers and even higher in the older paternal age. Despite the increasing numbers of stillbirths, it is important to highlight that this is still a small proportion and further studies are needed to confirm whether this trend will continue to increase or not. (Urhoj *et al.*, 2017). It was also shown in a systematic review that six out of thirty-one classifications were designed specifically for stillbirth and only one third included further studies besides clinical assessment such as histology or autopsy (Aminu *et al.*, 2017). The significance of the investigation of a fetal death is well established. Lewis *et al.* (2018), reviewed 34 papers from 1982 to 2015 and found a low Postmortem (PM) uptake due to some barriers that affect negatively the comprehension of the postmortem examination like the dislike of invasiveness, which was related by the parents especially concerning the procedure and the appearance of the baby. Other barriers reported were some difficulties to complete the procedure such as the need to transfer the baby to another place for the investigation or even lack of insurance cover. Protective parenting was also another barrier, as well as underestimation by health professionals on the procedure which makes parents decline the PM. Cultural and religious matters, involving cutting the body, especially in Islamic law which prohibits such situation have been described. On the other hand, some factors facilitate getting consent to the PM such as good explanation, contribution to research, showing respect towards the entire situation and special training and support for staff (Lewis *et al.*, 2018).

Wojcieszek *et al.* (2018) also concluded that more trials need to be conducted considering all the needs, economic costs to health services and concerns of the parents towards the investigation and identification of causes of stillbirth.

Shakespeare *et al.* (2019), selected 34 papers for this research, contemplating 17 countries in upper middle income and lower middle income. Altogether, there were 2934 participants and 303 women with previous experience with stillbirth. Women who have had bad experiences but had a supporting group, reported a lower time grieving and lower scores related to depression. Conversely, those who did not have support, suffered from stigma, isolation or denial and were prone to higher rates of depression and desires of counselling from healthcare workers. However, studies involving

health professionals highlight they also often had some problems recognising the signs of grief or even noticing the woman's or family needs and lack of training and counselling skills (Shakespeare *et al.*, 2019). Huberty *et al.* (2019), bring out the fact that the loss of the fetus can result in negative symptoms of post traumatic stress disorder, depression and anxiety. One study, including 90 participants divided into 3 groups for exercising or yoga, over half of the recruited participants completed the exercises. This approach had an decrease in PTSD (Post Traumatic Stress Disorder) and depression in the groups practicing yoga for 60 to 150 minutes per week (Huberty *et al.*, 2020). In another meta-analysis by Wojcieszek *et al.* (2018), data was collected from 222 women with previous history of stillbirth in order to evaluate different interventions of care prior and during subsequent pregnancies following stillbirth, however the results were not sufficient to analyse the situation due the lacking of trials. New researches across the experience of parents and health professionals through stillbirth, especially in low-income countries is needed to broaden the knowledge and better comprehend preventable situations and manage negative experiences (Shakespeare *et al.*, 2019).

CONCLUSION

This paper highlights the high rate of stillbirth and the disproportion of its distribution worldwide. Understanding the underlying causes of stillbirth and thoroughly investigating the cases in order to obtain more information, could help in the approach, management and prevention of stillbirths aiming to decrease the number of cases, especially in low-income countries. The investigation of interventions in the period of bereavement would not only help the comprehension for health professionals but also to the whole society, acknowledging ways to respect women and harbor families, preventing negative consequences.

Abbreviations

BMI- Body Mass Index
 HIC- High-Income Countries
 ICD - International Classification of Disease
 IUGR -Intrauterine Growth Retardation
 LIC- Low-Income Countries
 MIC- Middle-Income Countries
 PM – Postmortem
 PTSD - Post Traumatic Stress Disorder
 SES - Socioeconomic Status

Conflict of Interest: The authors declare that there is no conflict of interest.

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