

Applying Health Belief Model to Predict Factors influencing Women decision regarding Mode of Delivery.

*Jilan Ali Ibrahim Al- Battawi¹, Wafaa Ahmad Ibrahim²

^{1,2}Assistant Professor, Obstetric and Gynecological Nursing Department, Faculty of Nursing, Alexandria University, Egypt.

Corresponding Author: *Jilan Ali Ibrahim Al-Battawi

Abstract: Delivery by Caesarian Sections have become steadily increasing in both developed and developing countries. It is the most commonly performed major obstetric operation in the world and there is no doubt that it has contributed to improved obstetric care throughout the world. CS is usually performed when vaginal birth is deemed hazardous either to the fetus or the mother. **Aim of the study** was Predicting of Pregnant Women Decision Regarding Mode of Delivery in El-Shatby Maternity University Hospital. **Materials and Method: Research design:** Anon-experimental quantitative descriptive study was used. **Setting:** The study was conducted from March 2017 up to May, 2017 at, El-Shatby Maternity University Hospital, Alexandria, Egypt. **Subjects:** A total of 106 pregnant women attending the outpatient clinic at El-Shatby Maternity University Hospital were included in the study. Two Tools were used to collect the necessary data for the research. **Tool I:** Socio demographic, Sources of information and factors affecting on the preference of participant to choose mode of delivery structured interview questionnaire. It was divided into two parts. **Part one:** Concerned with participants' Socio-demographic data pertaining to age, educational level, employment status, occupation, monthly household income, residence, and sources of information on mode of delivery. **Part two:** Concerned with factors affecting on the preference of participant to choose mode of delivery. **Tool two:** The Champion's Health Belief Model Scale. **Data analysis** was carried out by using the latest version of the statistical software package SPSS (Version-21). Descriptive and analytical statistical test were used to analyze the data. **Results:** They reported "concern for health of the newborn" 81.79%, followed by "concern for maternal health" 66.19%, and "being a natural way of delivery" 87.32%. The main reasons for preferring CD were "avoidance of labor pain" reported by 94.28%. **Conclusion:** Although more women in this study preferred VB, there is evidence of a growing preference for CD. While age, level of and education influenced the decision made by the women in this study.

Key words: Mode of delivery, Caesarean Delivery (CD), Vaginal Birth (VB), Maternal Decision, Caesarean Delivery on Maternal Request (CDMR), Health Belief Model (HBM).

Date of Submission: 21-11-2017

Date of acceptance: 02-12-2017

I. Introduction

Vaginal Birth (VB) has been viewed as the natural inherent mode of birth, whereas delivery by Caesarean Section which incorporate an abdominal operative incision, perceived as a risky procedure designed for only women with medical and / or obstetrical indications.^[1] For a pregnant woman, the choice of mode of delivery is an important health decision. Expectant mother & father make many choices regarding labor and delivery. Decisions usually include place of delivery, and the choice between spontaneous vaginal delivery and caesarean section.^[2] Recently there has been observed a shift in their attitudes, so, it is become unsurprising for spouses to request a Caesarean Delivery (CD).^[3] "CD on Maternal Request" (CDMR) indicates a primary CD performed before labor spontaneously start and without maternal or fetal indications, where women are choosing for themselves their preferred mode of birth.^[1]

The caesarean section (CS) rates have increased continuously all over the World during the last decades.^[4-6] Increasing rates of birth by caesarean section are an issue in many countries.^[7] World Health Organization (WHO) 1985 had stated that: "There is no justification for any region to have (CS) rates more than 10-15%". Thereafter, CSs have become increasingly common in both developed and developing countries.^[8-10]

Cesarean delivery (CD) is a surgical procedure for delivery of fetus through an abdominal incision when vaginal delivery (VD) becomes blocked.^[11,12] Cesarean section (CS) is one of the most frequently performed major abdominal surgeries.^[13] It is difficult to pinpoint an exact cause for the rising rates of Caesarean sections. Medical, Institutional, legal, psychological and socio-demographic factors play a contributing role. The provision of CS on maternal request has been discussed as one of the main factors contributing to the rising rate of CS.^[7]

In the 1990s, caesarean section rates were reported to be 21% in the United States of America^[4], 16% in the United Kingdom and France^[14,15] while 36% in Brazil.^[9] According to a report by the National Institute of Health^[16], approximately 4–18% of all babies in the United States were born by CDMR in 2004. Overall, CDs in the United States have increased from 22.9 to 32.8% between 2000 and 2010.^[17] In 2011, it was reported that 8% of this increase in CDs at a major hospital in the United States was attributable to CDMR.^[18] In Hong Kong the rate of CD rose from 16.6% to 27.4% from 1987 to 1999, this means that there is 65% increase over 12 years.^[19] In the Islamic Republic of Iran, a limited study in Mashad city recorded the incidence of caesarean section as 6.9 and 10 per 100 deliveries in 1986 and 1987 respectively.^[20] Al-Mufti's study of London obstetricians published in 1997 where 17 % expressed the wish to have a CS for themselves in an uncomplicated pregnancy at term.^[21] A follow-up study by Groom 2002 verified Al-Mufti's results.^[22]

CS like other surgical operations, carries the risk of infection, to the local wounds as well as infection to the pelvic organs, respiratory, and urinary tract infections. Moreover, lung emboli, venous thrombosis, and complications from anesthesia are also not uncommon. Thus morbidity and mortality rates are higher in CS compared to normal vaginal delivery (NVD) in both mother and child.^[19,20] In addition, studies showed that financial burden of repeated CS, including duration of hospitalization, drugs administered, and their complications, are significantly greater if compared with NVD. Other complications of CS are the increased risk of placental adherence and uterine rupture in subsequent pregnancies, intensive care admission, hysterectomy, problems with subsequent fertility such and reduced fertility, ectopic pregnancy, miscarriage, and increased risks of fetal and neonatal mortality. Reasons for the increase in CS rates found are advancing maternal age, reduced parity and improvements in surgical techniques. In addition, hospital type whether it is private or public, availability of neonatal resuscitation unit, the health care experience and the time and day of delivery. Moreover, women are increasingly inclined to opt for delivery by caesarean for non-medical reasons due to intense fear of labor pain and concerns about date or time.^[23-25]

In Egypt, A study done by Marwan Khawaja and et al. concluded that, there is a significant rise in cesarean deliveries occurred for all births, from a low of 4.6 percent in 1992 to 10.3 percent in 2000. However, hospital-based cesarean deliveries were much higher in 1987–1988 (13.9%), increasing to 22.0 percent in 1999–2000.^[26]

Another study done on an academic and general obstetrical and gynecological hospitals in Cairo, revealed that out of 1015 deliveries, vaginal delivery accounted for 62.2% and 37.8% in Cairo University Hospital and Al Mattaria Teaching Hospital while 37.8% and 36.5% were delivered by CD in the twomentioned earlier hospitals respectively.^[27]

The Health Belief Model (HBM) is a psychosocial model that consider for health behaviors by identifying factors associated with individuals' beliefs which influence their behaviors.^[28] The Champion's Health Belief Model Scale (CHBMS) is a valid and reliable tool to predict factors influencing women decision regarding mode of delivery.^[29] The components of this model are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action.^[30] The health Belief Model (HBM) was developed to show that a person's response to their own health is directly related to their perceptions about the actual threat to their health condition and about whether or not any action they take regarding such condition worth it and whether it will benefit them or not.^[31]

In the present study, the Health Belief Model (HBM) was adopted as a conceptual framework, to provide a sound theoretical basis for understanding the factors that influence women's decisions for mode of delivery. The HBM can specify the relationship between health-related factors and beliefs to maternal behaviors, which can help in predicting the prospective behavior of a woman choosing a particular mode of birth.^[32]

Perceived susceptibility concerned with a person's belief in his or her vulnerability to some medical condition. The more that person believes he or she is at great risk, this person is more likely to adopt a particular health-related behavior to prevent or at least decrease expected risk.^[32] It is a subjective perception of the risk of an illness. In the context of mode of delivery, perceived susceptibility may include the risk of death for self or the baby. Women will choose safer mode of delivery if they believe they are personally at risk. For example, unfavorable experience in a prior birth could affect a woman's preference for a particular mode of birth subsequently, due to the belief that the negative experience could occur again.^[33]

Perceived severity is defined as one's belief in the intensity and seriousness of the medical condition and its undesirable outcomes.^[32] Possible medical consequences may include death, disability, and pain. Possible social consequences may include effects on work, family, and social relations. If it is believed that there are very serious or intolerable complications associated with a specific mode of birth, women are more likely to prefer the alternative method of delivery, aimed to reduce its risk. The most severe complications that may occur as a result of both VB and CD are maternal and neonatal mortality.^[34]

A global survey by the World Health Organization between 2004 and 2008 reported the risks of maternal mortality and morbidity in CD without medical indications^[35] concluded that, the risks due to CD were three times greater than those for VB, including maternal mortality, admission to an intensive care unit, the need for blood transfusion, and the need to carry out a hysterectomy or internal iliac artery ligation when

complications arise. Moreover, CD can have several negative consequences on maternal health such as pelvic adhesion, complications from anesthesia, and uterine rupture.^[34] Neonatal respiratory depression secondary to maternal anesthesia has also associated with CD.^[36]

In the other hand maternal complications associated with VB include perineal trauma, prolonged labor, and pelvic organ prolapse.^[37, 38] For the neonate, there is also an increased chance for acquiring infections such as Hepatitis C, HIV, and Human papilloma virus while delivered through birth canal.^[32]

Perceived benefits are defined as one's belief in the efficacy of the advised action feeling that outcomes can be positively affected by engaging in a particular health behavior and reducing risks.^[32] The advantages of maternal and fetal health and a sense or anticipating fulfillment and satisfaction of sociocultural beliefs have been identified as important factors in maternal decision making. When considering the perceived benefits for the health of laboring women, it has been identified that in a number of countries women relate VB many benefits than CD. Women in Singapore (91.5%), Turkey (89%), and the USA (42%) believed that VB offers a faster recovery, earlier discharge, and the absence of a CD scar.^[36,39-41] As regard neonatal health, nearly 60% of women believed that VB is much safer for the baby compared to CD. Women also reported that VB enables early initiation of breastfeeding and earlier bonding with their baby.^[36]

In comparison, a fear of labor (50%) and repetitive vaginal examinations (23%) were underlying reasons why women showed a preference for CD.^[36] This was supported by women identifying an intense fear of labor contractions, prolonged labor, episiotomy and perineal trauma, and fetal distress associated with VB as reasons for planning to have a CD.^[33, 42- 44] Women also find advantages of CD in maintaining genital appearance (24%), and decrease sexual dissatisfaction (0.8%) following delivery.^[36,42] From another perspective, women also perceived CD as more convenient, allowing them to better plan their maternity leave.^[45]

Perceived Barriers refers to an individual's perception of the difficulties and potential negative aspects or barriers stopping them from following a specific health-related behavior.^[32] This is the belief about physical and psychological costs of taking health action. Potential barriers may include financial expenses, danger of the procedure, pain, feeling upset, inconvenience, and time-consumption.^[46] The desire to choose VB is prevented by existing medical contraindications due to pelvic disproportion, pre-eclampsia, severe cardiovascular disease, diabetes mellitus, active genital herpes, HIV infection, and multiple gestations.^[47- 49] On the other hand, fetal malposition's, fetal malpresentation, cord prolapse, and macrosomia are also contraindicated conditions for VD.^[50, 51]

Cues to action are the strategies taken to activate one's readiness to take health action. Cues to action, formerly known as motivation, refer to internal incentives to live a healthy lifestyle. Cues to action refer to the factors that help individual make health-related decisions.^[32] Advice from relatives, friends, health care professionals, as well as an awareness of the rights of women are crucial factors guiding the maternal decision on delivery method. Women's beliefs and attitudes towards a particular mode of delivery are strongly influenced by the stories and advice that they hear from relatives and friends.^[42,52] Women were driven to an alternative mode of delivery after hearing negative stories about a particular mode increasing concern that they might have the same experience when they gave birth.^[53, 54] In addition, the pregnant woman might also worry if she had family history of poor obstetric outcomes.^[55] Advice from health care professionals such as midwives and doctors very much influences a woman's understanding of a particular delivery mode and her preference for it.^[56]

The health Belief Model (HBM) was developed to show that a persons' response to their own health is directly related to their perceptions about the actual threat to their health condition and about whether or not any action they take regarding such condition worth it and whether it will benefit them or not.^[57] Other than advice from others, some women perceived that they should have their own right to decide the mode of delivery. This is one of the mains reason why CDMR rates are increasing worldwide.^[58]

Nurses and midwives as well as obstetricians can better support women by providing appropriate information during pregnancy, enabling them to make an informed choice and take an active part in the decision-making process. There are very few studies in Egypt addressed decision for mode of delivery among Egyptian women, therefore this study was carried out to predict factors influencing women decision regarding mode of delivery applying Health Belief Model framework.

Aim of the study

The aim of this study was: applying Health Belief Model to predict factors influencing women decision regarding mode of delivery.

Research question:

Applying of Health Belief Model, what is the factors influencing women decision regarding mode of delivery?

II. Materials and Method

Materials

Research design

A descriptive cross-sectional nonexperimental quantitative study design was used to carry out this study.

Setting

The study was conducted in the outpatient clinics at El Shatby Maternity University Hospital. Alexandria, Egypt. It is a university hospital affiliated to the Faculty of Medicine – University. It provides obstetrics and gynecological health care service for all pregnant, laboring, puerperal women, normal and high risk in the governorates of Alexandria, Beheira, Marsa Matrouh and Kafr El Sheikh. It has establishment of five units in El Shatby Hospital: Infertility and Fertility treatment Unit, Advanced Endoscopic Surgery Unit, Initiation of the establishment of a unit of research and treatment of endometriosis, start establishing the embryo and pregnant unit, & Start the Oncology Unit. The outpatient includes a clinic for treatment of uterine bleeding, Infertility clinic, Oncology Clinic, Clinic for follow - up pregnancy and critical pregnancy, and Clinic for the detection of women. Rehabilitation and development of internal departments for patients in the hospital. This hospital was chosen because it has a high turnover, serve four governorate with a large number of population and specialized in obstetrics and gynecology.

Subjects

A convenience sampling technique to select a total of 106 volunteer pregnant women with normal pregnancy enrolled in this study were recruited based on their availability and willingness to participate in the study. Women were approached as they were entering or leaving the outpatient clinic. Participants were invited to take part in the study in June through August 2016. The sample size was determined based on the following formula:

Sampling Size:

The sample size was determined based on The Epi info program was used to estimate sample size using the following parameters:

- Population size = 58 /month
- Expected frequency = 50%
- Acceptable error = 5%
- Confidence coefficient = 95
- Estimated sample size = 106

Inclusion criteria: In the present study only pregnant women who were available and willing to voluntarily participate in the study, recruited. Pregnant women who were 20–40 years old during the last trimester.

Exclusion criteria: Those diagnosed with pregnancy-related complications, such as pregnancy-induced hypertension, gestational diabetes and high-risk pregnancy including multiple gestations as well as women who were not willing to participate in the study, they were excluded.

Data collection tools:

Two tools were used for data collection.

Tool I: Socio demographic, Sources of information and factors affecting on the preference of participant to choose mode of delivery structured interview questionnaire:

A study-specific structured interview questionnaire was developed by the researcher. The items of the questionnaire were drawn after extensive review of the current and relevant literature.

Tool one: It was divided into two parts:-

Part one: Concerned with participants' Socio -demographic data pertaining to age, educational level, employment status, occupation, monthly household income, residence, and sources of information about mode of delivery.

Part two: Concerned with factors affecting on the preference of participant to choose mode of delivery. It encompasses items related to baby's factors, maternal health and social factors.

Tool II: The Champion's Health Belief Model Scale (CHBMS)^[59]

The Arabic version of revised Champion's Health Belief Model Scale (CHBMS) was tested for validity and reliability in Mikhail and Petro-Nustas^[60] and found satisfactory. It consists of 5 dimensions: perceived susceptibility (2 items), perceived benefits (9 items), Perceived severity (4 items), perceived barriers (1 item), and Cues to action (2 items).^[61] All the items have 5 response choices ranging from strongly disagreement (1 point) to strongly agreement (5 points). Reported Cronbach's alpha for the CHBMS was 0.892

Method:

The study was executed according to the following steps:

1. Permission to collect data after explaining the purpose of the study was obtained.
2. Tool 1 was developed by the researchers after extensive review of recent and related literature.
3. Tools II Arabic version of revised Champion's Health Belief Model Scale (CHBMS) [31] was tested for validity and reliability in Mikhail and Petro-Nustas [20] and found satisfactory. It was tested for content validity by a jury of five experts in the field of the research study. The recommended modifications were done and the final form was prepared after proving valid. Then the overall tools' reliability and internal consistency for the scale was tested using alpha Cronbach's coefficient test and the result was statistically highly acceptable ($r = 0.892$).
5. The normal range of Cronbach's alpha values is between 0.00 and +1.00, and higher values reflect higher internal consistency (Polit & Beck, 2012).
6. A pilot study was conducted on 10 % of the study sample from El Shatby Maternity University Hospital and they were (excluded from the total study subject's number). It aims to validate the effectiveness of the study instrument and the value of the questions to elicit the right information to answer the research questions and to establish the reliability of the questionnaire. In addition to ascertain the clarity, feasibility, simplicity of all the questions, estimate the time required for the interview to be completed, and review the overall responses of the women, as well as the applicability of the tools to identify obstacle that might interfere with the process of data collection. Necessary modifications based on the results of pilot study were introduced.
7. Each study subject was individually interviewed in the outpatient in waiting area before or after met with obstetrician. The estimated duration of each interview was about 15 minutes. Data collection started at June 2016 up to August 2016, two days per week.
8. Statistical analysis: The collected data was revised, categorized, coded, computerized, tabulated and analyzed. Descriptive statistics and a Chi-square test were used to identify and compare the demographic information, influencing factors, and the five constructs of the HBM between two preference groups. P value ≤ 0.05 was considered statistically significant.

Ethical considerations:

Before embarking to data collection, an informed oral consent was obtained from each recruited subject to share in the study. Prior consent, full information provided to the women by the researcher and explaining the purpose of the study, as the informed consent covers all the required elements such as study title and aim, process of data collection and management. All participants were assured that their participation is voluntary and they have the right to withdraw at any time & the right to ask any question at the end of the interview. In addition, her anonymity, privacy, and confidentiality of her data were all emphasized prior starting the interview. Each study participant was approached separately. The average fill out time of each interview was about 15 minutes. Questions were asked personally by the researchers.

III. Results

Table I: Socio demographic factors between women who prefer a vaginal birth or cesarean delivery.

Items	Total (n=106) N%	Prefer VB (n=71) N (%)	Prefer CD (n= 35) N(%)	P-value
Age				
>20->25	17 (16.04)	4 (5.63)	13 (37.14)	0.003**
25->35	76 (71.69)	61 (85.91)	15 (42.85)	
35 +	13 (12.27)	6 (8.46)	7 (20.00)	
Educational Level				
Illiterate /Primary	34 (32.08)	23 (32.39)	11 (45.81)	0.005*
Prep/ Secondary	55 (51.88)	40 (56.34)	15 (20.87)	
University	17 (16.04)	8 (11.27)	9 (12.50)	
Employment status				
House wife	31 (29.25)	19 (26.76)	12 (16.60)	0.148
Worked full time	60 (56.60)	43 (60.56)	17 (29.16)	
Worked partial time	15 (14.15)	9 (12.68)	6 (8.33)	
Women's occupation				
Non Paid work	70 (66.03)	35 (49.30)	35 (100)	0.005*
Paid work	36 (33.96)	36 (50.70)	0.00	

Monthly household income				
Not enough	20 (18.87)	8 (11.27)	12 (50)	0.030*
Enough	75 (70.75)	58 (81.69)	17 (25)	
Enough and more	11 (10.38)	5 (7.04)	6 (33.33)	
Residence				
Urban	72 (67.92)	50 (70.42)	22 (62.85)	0.16
Rural	34 (32.08)	21 (29.58)	13 (37.15)	
Sources of information on mode of delivery¹				
Obstetrician				
Nurses	12 (11.32)	5 (6.90)	7 (29.16)	0.231
Relatives	20 (18.86)	11 (13.41)	9 (37.50)	0.233
Friends	38 (35.84)	24 (29.26)	14 (58.33)	0.130
Previous birth -experience	45 (42.45)	27 (32.92)	18 (75.50)	0.308
Internet / Books	35 (33.01)	18 (20.73)	17 (70.83)	0.198
	40 (37.73)	18 (20.73)	22 (91.66)	0.001***

¹ More than one answer

* = P < 0.05, ** = P < 0.01,

*** = P < 0.001

Table 1 represents the socio- demographic characteristics of the study subjects and sources of information without financial and medical considerations, 71 out of the 106 women (66.98%) indicated a preference for VB, while the remaining 35 women (33.02%) preferred CD. The socio- demographic characteristics of the respondents were further compared according to the maternal preference of mode of birth using Chi-square tests (Table 1). Those who preferred CD, when compared with those who preferred VB, were more likely to be in the advanced maternal age group of over 35 years old (20.0% vs. 8.46%). Regarding educational level women who have received a preparatory and secondary level of education and prefer VB constitute 56.34% vs. 20.87% who prefer CD respectively. There were statistically significant differences between the two groups of women in terms of age (P = 0.003), level of education (P = 0.005), and occupation (P = 0.005). Moreover, Monthly household income more than four fifths (81.69) of women who prefer VB vs. 25.00% of women who prefer CD have enough monthly household income and There were statistically significant differences between both groups of women (P = 0.03).

Over two fifths of the women (42.45 %) in both groups reported that they had been provided information on the different modes of delivery by friends while 37.73 of women in both groups reported they get their information from Internet / Books and there were statistically significant differences between both groups of women (P = 0.001). In both groups only 18.86% of women reported get their information from nurses. A (P) value was used to compare the factors that childbearing age women would take into consideration when making their decision.

Table II: factors affecting on the preference of participant to choose mode of delivery.

Items	Prefer VB N= 71 N%	Prefer CD N=35 N%	P-Value
Baby's factors			
- Health of the new born	58 (81.79)	31 (88.57)	0.033*
- Birth trauma to the newborn.	42 (59.15)	24 (68.57)	0.016*
- Respiratory trauma to the new born	28 (30.43)	20 (57.14)	0.013*
- Newborn's birth presentation	22 (30.98)	17 (48.57)	0.051*

- Large baby.	20 (28.16)	23 (65.71)	0.001**
Maternal factor			
- Maternal health	47 (66.19)	33 (94.28)	0.001**
- Labor pain	38 (53.52)	33 (94.28)	0.001***
- Unsightly abnormal scars	31 (43.66)	4 (11.42)	0.001***
- Worry about tearing of the perineum	8 (11.26)	15 (42.85)	0.001***
- Possible anal / urinary incontinence due to VD	4 (5.63)	22 (62.85)	0.001***
- Possible better sexual satisfaction	20 (28.16)	26 (74.28)	0.001***
Social factors			
- Natural way of delivery	62 (87.32)	12 (34.28)	0.001***
- Faster / more convenient method of delivery.	45 (63.33)	23 (65.77)	0.033**
- Certainly about The timing of delivery.	8 (11.26)	33 (94.28)	0.001***
- better planning for maternity leave	10 (14.08)	28 (80.00)	0.001***
- Better planning for paternity leave	12 (16.90)	32 (91.42)	0.001***
- Medical insurance coverage	65 (91.54)	7 (20.00)	0.171**
- Women should have the right to choose.	13 (18.30)	34 (97.14)	0.001***

< 0.005**

A Chi-square test was used to compare the factors that childbearing age women would take into consideration when making their decision.

* = P < 0.05, ** = P < 0.01, *** = P < 0.001

Table II illustrate that the most commonly cited factors for preferring VB. Factors influencing mode of birth, Women were asked to indicate, if given a free choice on mode of birth without financial and medical considerations, all of the factors that they would consider when making a decision on VB or CD. Table 2 shows the factors that these women took into consideration. They reported “concern for health of the newborn” 81.79%, followed by “concern for maternal health” 66.19%, and “being a natural way of delivery” 87.32%. The main reasons for preferring CD were “avoidance of labor pain” reported by 94.28%, “concern for the health of the newborn” reported by 88.57%, and “concern for maternal health” mentioned by 94.28%. Statistically significant differences between the two groups of women preferring VB or CD were demonstrated for all influencing factors (P < 0.001). Social factors found also, a great effect on the women preference to choose VB or CD, and statistically significant differences between the two groups of women preferring VB or CD were demonstrated for most of the influencing factors (P < 0.001).

Table III: Construct of HBM relating to women's perception of mode of delivery: A comparison between the two groups of women (n = 106)

Women's perception of mode of Vaginal delivery	Prefer VB n = 71 n (%)	Prefer CD n= 35 n (%)	P- Value
Perceived Susceptibility.			
Painful labor process	3 (4.22)	2 (5.71)	0.158
Postpartum hemorrhage	1 (1.40)	3 (8.57)	0.011*
Perceived benefits			
VB is a normal / natural process	71 (100)	22 (62.85)	0.001***
Allows early contact with newborn after delivery	65 (91.54)	19 (54.28)	0.001***
Allows early Breastfeeding	69 (97.18)	21 (60.00)	0.001***
Shorter hospital stay	68 (95.77)	23 (65.71)	0.001***
Faster recovery after delivery	60 (84.50)	17 (48.57)	0.001***
No unnecessary surgical wound pain	63 (88.73)	18 (51.42)	0.001***
No need for an operation and anesthesia	61 (85.91)	20 (57.14)	0.001***
The fate of my baby is determined by God	66 (92.95)	21 (60.00)	0.001***

Covered by insurance / hospital authority	65 (91.54)	19 (54.28)	0.001***
Perceived severity			
Risk of fetal injuries when the baby goes through vaginal canal	28 (39.43)	30 (85.71)	0.001***
Risk of mother –to- child transmission of infectious agents during vaginal birth	24 (33.80)	27 (77.14)	0.001***
Worry about perineal tears due to vaginal birth	15 (21.12)	32 (91.42)	0.001***
Concern of having urinary / anal incontinence if vaginal delivery is performed.	16 (22.53)	31 (88.57)	0.001***
Perceived barriers			
Presence of contra indication of VB	23 (45.07)	13 (37.14)	0.112
Cues to action			
Healthcare professionals advise VB	58 (81.69)	22 (62.85)	0.11*
Relatives / friends advise VB	60 (84.50)	23 (65.71)	0.001***
Have heard negative stories from relative / friends about their cesarean delivery.	25 (35.21)	12 (34.28)	0.284

Table 3 shows the women’s perceptions of VB according to the five constructs of HBM, and the comparison between the two groups of women. Among women who reported preference for VB, only a small number considered themselves susceptible to common complications such as “painful labor” (n=3) and postpartum hemorrhage (n=1) due to VB. Women who expressed a preference for VB in comparison with those who preferred CD were more likely to perceive the benefits of VB. The top three benefits of VB were deemed to be: “a normal or natural process” (100% vs. 62.85%), “allows early breastfeeding” (97.18% vs. 60%), and “faster recovery” (84.50% vs. 48.57%). Statistically significant differences were found for all three items, with P = <0.001. Women who preferred VB were significantly less worried about the perceived severity of “fetal injuries with the baby born vaginally” (39.43% vs. 85.71%) and “perineal tears” (21.12% vs. 91.42%) and for shorter hospital stay (95.77% vs 65.71%). Presence of contra indication of VB reported by 45.07% of women preferred VB vs 37.14% of women preferred CD. There was no statistically significant difference. More of them reported that received advice from relatives/friends” (84.50%) and “health care professionals” (81.69%) were their cues for action to prefer vaginal delivery compared to 65.71%, 62.85 % for same items by women who prefer CD respectively.

Table IV: Constructs of HBM relating to women's perception of cesarean delivery: comparison between the two groups of women (n= 106)

Women's perception of cesarean delivery	VB N= 71 N%	CD N = 35 N%	p-value
Perceived susceptibility			
Abdominal wound infection	2 (2.81)	0 (0.0)	0.107
Long time of recovery	1 (1.40)	2 (5.71)	0.113
Perceived benefits			
A faster / more convenient method of delivery	36 (50.70)	30 (85.71)	0.001***
A trend / modern method of delivery.			
Less fear of prolonged labor and fetal injuries.	27 (38.02)	28 (80.00)	0.001***
Avoid pain included by receptive vaginal examinations.	32 (45.07)	31 (88.57)	0.001***
Avoid the necessity of including labor.			
Prevent labor pain.	29 (40.48)	27 (77.14)	0.001***
Avoid prolonged labor.			
Preserve sexual function and general appearance.	31 (43.66)	29 (82.85)	0.001***
Allow better planning of maternity leave.	28 (39.43)	26 (74.28)	0.001***
Can select an auspicious date to deliver my baby.	34 (47.88)	25 (71.42)	0.001***
	30 (42.25)	27 (77.14)	0.001***
	25 (35.21)	30 (85.71)	0.025
	23 (92.39)	29 (82.95)	0.310

Perceived severity			
Concern over the anesthesia complications of CD	65 (91.54)	16 (45.71)	0.001***
Afraid of uterine ruptures if cesarean delivery is performed	50 (70.42)	13 (37.14)	0.04**
Afraid of adhesion formation if caesarean delivery is performed.	58 (81.69)	6 (17.14)	0.001***
Perceived barriers			
Extra cost of CD out of own pocket.	35 (49.29)	18 (51.42)	0.317
Can't choose CD in a public hospital.	48 (67.60)	16 (45.71)	0.001***
Cues to action			
Health care professionals advise CD	37 (52.11)	24 (68.57)	0.002**
Relative / friends advice	12 (16.90)	20 (57.14)	0.001***
I heard negative stories from relatives / friends	20 (28.16)	18 (51.42)	0.002**
I have a family history of difficult births.	11 (15.49)	13 (37.14)	0.001***

Table 4 shows the women's perceptions of CD according to the five constructs of HBM, and the comparison between the two groups of women. It was revealed that women considered themselves prone to "abdominal wound infections" (n = 0), and "a long recovery time" (n = 2) due to CD. Women who expressed a preference for CD, in comparison with those who preferred VB, were more likely to identify the benefits of CD. The top benefits were being able to "avoid prolonged labor" (47.88% vs. 71.28%), "prevent labor pain (39.43% vs. 74.28%), "reduction of fear induced by prolonged labor and fetal injuries" (45.07% vs. 88.57%), and being "a faster and more convenient way of delivery" (50.70% vs. 85.71%). On all of these items, statistically significant differences between the two groups of women, with $p < 0.001$. These women, compared with their counterparts, were also less likely to perceive the severity of using anesthesia during CD by (45.71% vs. 91.54% of participants prefer VB. Statistically significant differences were found between both groups ($P = < 0.001$). less worried about "uterine scar ruptures" (37.14% vs. 84.50%), and "the formation of scar adhesion" (17.14% vs. 81.69%) reported by women prefer CD and preferred VB respectively. They also were more likely to consider the restrictions placed by public hospitals on CDMR to be a barrier to the use of CD (45.71% vs. 67.60%) mentioned by women prefer CD vs VB. "Advice from health care professionals" reported by 68.57%, followed by "friends/relatives" by 57.14%, "have heard negative stories about VB" (51.42%), and "a family history of difficulty in childbirth" (37.14%) were all cues to action for those who expressed a preference for CD vs 52.11%, 16.90%, 28.16%, 15.49% mentioned by women who preferred VB respectively.

IV. Discussion

The age-specific fertility statistics reported by the Hong Kong Census and Statistics Department in 2013^[62] show that the majority of births occur among women in the age group of 25->35. In this study, the majority of women of childbearing age were between 25->35 years of age, showing that the sample in this study is comparable to that for Hong Kong in general. In addition, the largest proportion of the sample were living in the New Territories (52%), followed by Kowloon (39.2%) and Hong Kong Island (8.8%). These percentages are consistent with the geographical distribution of the Hong Kong female population, with the majority of women (51.9%) living in the New Territories in 2011.^[62] It is concluded that the sample in this study is representative of women of childbearing age in Hong Kong.

In this study, the majority of the women indicated their preference for VD (71.0%) over CD (35.0%). This percentage is similar to that found in other countries of Asia, with a high percentage of women in South Korea (96.9%), Singapore (95.1%), and Turkey (84.1%), preferring VB as their mode of birth.^[39-42] A high preference for VB, at 89%, was also reported in a study conducted in North Carolina, USA.^[63] The reported 22.9% preference rate for CD is lower than in the urban regions of China (54.1%)^[64], Taiwan (35.2%).^[65] However, at 22.9% the preference rate for CDs expressed by the women in this study is somewhat higher than the rate for elective CDs for non-medical indications in Hong Kong in 2004, at 16.7%.^[66] That percentage also exceeds the rate of 10–15% for CDs considered optimal by the World Health Organization.^[67] This indicates that an increasing number of Hong Kong women prefer to give birth by CD.

This study found that only (11.32%) of women received information on mode of birth from their obstetrician. However, it has been revealed that most of the information given out by obstetricians relates to the birth procedure rather than to the possible risks and benefits of the different modes of delivery.^[65] This study also found that women identified nurses (18.86%) as less likely to have been a source of information related to

mode of birth than their own friends (42.45%) and relatives (35.84%). This result shows that obstetricians and nurses are not providing sufficient information. More education on health concerns and modes of birth is needed if childbearing women are to make an informed decision on mode of birth.

Characteristics of women preferring two different modes of delivery. The results of this study indicate that age, level of education, and occupation are significant correlates for women's preference on mode of birth. A preference for CD was associated with advanced maternal age. Previous studies have speculated about the relationship between advanced maternal age and the likelihood of CD, in that pregnant women of advanced age have been shown to hold a strong belief that their advanced age puts them and their baby at risk during labor and delivery, due to the physiological factors related to aging.^[67] A study in Taiwan also revealed that older women worried whether their baby would be able to pass safely through the vaginal canal.^[68] This concern has led to the belief that CD is safer mode of delivery for pregnant women of advanced age. Women with higher levels of education were found to be more likely to choose VB as their preferred mode of birth. This finding is inconsistent with other reports indicating that more educated women would choose CD as the mode of delivery.^[68]

As regard factors considerations when making decisions on mode of delivery. The most common concerns of women who preferred VB were over maternal health (66.19%) and the health of the baby (81.79%). This is consistent with the results from other studies. Studies have reported that the majority of women considered VB to be a safer mode of birth for the mother (81.7%) and the neonate (72.8%).^[40] The majority of women prefer VB because it allows for an earlier discharge from hospital and for the mother to recover more quickly.^[40] The risk of surgery and anesthetic drugs passing to the neonate in CD is also a consideration for women who prefer VB.^[36]

On the other hand, the most common factor for women to request a CD was to avoid labor pain (53.52%), concern for the health of the newborn (81.79%), and worry about potential birth trauma (59.15 %) and respiratory trauma (30.43) to the newborn from a vaginal birth. Labor is often thought of as one of the more painful events in human experience and women are fearful of experiencing pain during labor.^[39] As a vaginal birth is regarded as "the most natural process of birth," women who want to have a natural birth prefer VB (100%). This is also an important reason given by the nearly 90% of women in other studies who choose VB.^[36,41] However, women who preferred CD expressed a wish for certainty about the date of the birth (82.95%), and thus to be better able to plan for maternity leave (85.71%). This is perhaps understandable for contemporary women who have their own career, with 29.16% of the participants indicating that they wanted to have the right to choose the mode by which their baby would be delivered.

The HBM constructs and maternal preference on mode of birth. There were significant differences between women who preferred VB and CD in their perceptions of the benefits and severity of different modes of birth. Women who preferred VB perceived the benefits of VB as being that it is a normal and natural process (100%), recovery is faster after delivery, it allows for earlier breastfeeding, and no unnecessary surgery and anesthesia is involved in the process. These women were also less worried about fetal injuries during vaginal birth than those who preferred CD. Women who preferred CD believed that by opting for this process they would be able to avoid prolonged labor (71.42%), labor pain (74.28%), and fetal injuries, as well as have a fast and convenient delivery. For women who preferred CD, advice from health professionals, negative stories of VB from relatives and friends, as well as a family history of difficult births were the cues for action. (Table 3)

Women who preferred VB had a significantly higher mean score on the perceived benefits and a lower score on the perceived severity of VB than those who preferred CD. Women who preferred CD had a significantly higher mean score on the perceived benefits and a lower score on the perceived severity of CD, and a higher mean score on cues to action than those who preferred VB. These results are consistent with those of other studies. Studies have confirmed that perceived benefits are a predictive factor of delivery preference.^[69-71] Women weighed the considerations of the maternal/fetal benefits and complications of a particular mode of birth^[36, 72], demonstrating the importance of these constructs of HBM in decision making.

Cues to action indicated that advice from professionals played an important role in the maternal decision on mode of birth, especially for CD. Other research reported that advice from physicians is an important influence on women in their choice of mode of birth.^[73] A study has shown that only 5% of women continued to attempt a VB when they perceived that their obstetrician held an unfavorable attitude towards VB.^[74] Some midwives have actually been reported to encourage women to undergo a CD in order to protect their pelvic floor and reduce the risks of developing urinary or fecal incontinence.^[75]

V. Conclusion

From this study it can concluded that a better understanding of the prevalence and the factors influencing the choice of mode of delivery among childbearing women. However, a longitudinal study is needed to identify if women change their perception and choice on mode of delivery during pregnancy or after delivery. Although more women in this study preferred VB, there is evidence of a growing preference for CD. While age,

level of and education influenced the decision made by the women in this study. The perceptions of the benefits and severity of the different modes of delivery were the most important considerations. There is also evidence that advice from health professionals plays an important role in the maternal decision on mode of birth.

VI. Recommendations

Based on the findings of this study the following recommendations are presented:

- 1- There is a need for empower women with comprehensive information on the benefits and severity of the different modes of delivery.
- 2- Women of childbearing age have a right to receive comprehensive and unbiased information from health professionals regarding all aspects of delivery as well as different birth modes, so women can make an informed choice on the mode of birth that is most suitable for them.
- 3- Further studies are required to determine the reasons for this difference, such as the level of knowledge on childbirth held of these women, or social and economic differences between the studied populations.
- 4- This research indicates that there is value in designing educational programs for pregnant women to educate them on the benefits, risks, and severity of the different modes of birth based on the constructs of HBM. This will empowered women to be active participants in choosing the mode of birth that they believe is right for them.
- 5- Replicate this study using larger samples of the population and include more than one hospital with different affiliations in different regions of Egypt in order to generalize the findings.
- 6- Additional efforts to support and encourages policymakers to set policy for health care services based on evidence.
- 7- Assess factors affecting women decision to choose CD and whether it is real or based in false information. Evidence shows that patients who are knowledgeable about their conditions are able to actively participate in shared decision-making.
- 8- Effort should be directed to improve patient knowledge about benefit and risks of CD to empower women to make informed decision about their health conditions.

Conflicts Of Interest Disclosure:

The authors declare that there is no conflict of interest.

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Jilan AliIbrahim Al- Battawi "Applying Health Belief Model to Predict Factors influencing Women decision regarding Mode of Delivery." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* , vol. 6, no.6 , 2017, pp. 44-56.