

## Prevalence of Caesarean Section and its Indicating Factors among Pregnant Women Attending Delivery at King Abdulaziz University Hospital, Jeddah City During 2016

Zakai Ghadeer H<sup>1\*</sup>, Alrowithi Abdullah S<sup>2</sup>, Buhlaigah Afnan M<sup>3</sup>, Alharbi Abdullah A<sup>4</sup>, Hakami Abrar H<sup>5</sup>, Alqahtani Hanoof A<sup>6</sup>, Alasmari Aeshah M<sup>7</sup>, Alamri Fatimah S<sup>8</sup>, Alshikh Duaa A<sup>9</sup> and Aljhni Amair O<sup>10</sup>

<sup>1</sup>Medical intern, King Abdulaziz university, Saudi Arabia

<sup>2</sup>Medical intern, Almaarefa Collages, Saudi Arabia

<sup>3</sup>General Physician, Jubail General Hospital, Saudi Arabia

<sup>4</sup>Medical intern, Umm AlQura university, Saudi Arabia

<sup>5</sup>Medical intern, Jazan university, Saudi Arabia

<sup>6,7,8</sup>Obs/Gyn Resident, Abha Maternity and Children hospital, Saudi Arabia.

<sup>9</sup>medical resident, Maternity and Children hospital, Saudi Arabia

<sup>10</sup>General Physician, Ministry of health, Saudi Arabia

**\*Corresponding Author:** Zakai Ghadeer H, Medical intern, King Abdulaziz university, Saudi Arabia.

**Received:** December 26, 2017; **Published:** January 12, 2018

### Abstract

**Background:** The term caesarean section may be used to describe the delivery of fetus through a surgical incision of anterior uterine wall. Caesarean section is usually performed when vaginal delivery will put the mother's or child's health or life at risk. There are 2 types of caesarean section procedures, the lower segment caesarean section (LSCS), which is the common one, 95% of caesarean sections are LSCS, and upper segment caesarean section.

The number of caesarean sections has continued to increase worldwide in the last three decades. WHO recommended guidelines stating that caesarean section birth rates should range between (5) and (15) percent. adding that rates lower than five percent reflect women's lack of access to life saving care and levels more than 15 percent carry no additional benefits to mother or newborn. The complications of caesarean section are divided into short term and long term risks. We aim in this study to determine prevalence of caesarean section, to establish a data base of caesarean section that would help in further researches and to improve the quality of hospital care, and ensure a good health of mother and child in order to improve life.

**Objective:** To determine the prevalence of caesarean section and its indicating factors among pregnant women attended delivery at King Abdulaziz University Hospital (KAUH) in Jeddah city, from 1<sup>st</sup> January to 31<sup>st</sup> December 2016.

**Method:** This study is a retrospective descriptive study, relied on data that collected through obstetric records. It was carried out by group of medical researchers, to determine the prevalence of caesarean section in KAUH during 2016. It included all pregnant women who attended KAUH's obstetric department for delivery during 2016.

**Results:** Results of all the (5507) cases presented to the hospital for delivery in 2016, there were (754) cases underwent caesarean section representing (13.7%), done at a rate of (2.06) caesarean sections daily.

The trend of caesarean section between (2011 - 2016), has reached the its highest percentage in 2014 (16.6%) and lowest percentage in 2016 (13.7 %). The trend was fluctuated between these values in the other years. The main indications of caesarean section in our study was maternal indications (44.9%), fetal indications (27.9%) then fetomaternal indications (27.2%). Failure to progress was the most common indication (15.9%), The vast majority of uterine incisions were lower segment caesarean section (LSCS) (98.9%), while the upper uterine segment incision were very rare.

**Conclusion and Recommendation:** The rate of caesarean section in this study was 13.7%. The majority of the women underwent caesarean section aged between (20 - 35) years old. Emergency caesarean section rate was high. Grand multigravida women took the lower percentage regarding caesarean section. Fetal outcome was excellent. We recommend a formal childbirth education for pregnant women to enhance childbirth preparation and empower women to cope with the changes and challenges of pregnancy and childbirth.

**Keywords:** Caesarean Section; King Abdulaziz University Hospital; Jeddah; Saudi Arabia

## **Introduction**

The term caesarean section may be used to describe the delivery of fetus through a surgical incision of anterior uterine wall. Caesarean section is usually performed when vaginal delivery will put the mother's or child's health or life at risk [1]. Regarding surgical procedure of caesarean section, there are 2 types mostly, the common lower uterine segment incision used in over 95% of caesarean sections and upper uterine segment incision. The upper segment incision is always recommended due to ease of repair, reduced blood loss and low incidence of dehiscence or rupture in subsequent pregnancies. Classical caesarean section incision is indicated when it is difficult to perform lower uterine segment incision or in placenta praevia and transverse lie with the back down [2]. The first modern caesarean section was performed by German gynecologist Ferdinand Adolf Kehler in 1881 [1].

Indications of caesarean section can be categorized in several ways. some indications strictly benefit the fetus, whereas others are largely done for maternal benefit and some indications will benefit both mother and fetus [3].

In general the indications of caesarean section divided into two categories: absolute and relative. The absolute indications are cephalopelvic disproportion, previous uterine surgery, prior uterine rupture and previous successful repair of vesico-vaginal fistula. The relative indications are failed induction of labour, placenta praevia, placental abruption, fetal distress, cord prolapse, maternal disease (preeclampsia and diabetic), cord presentation in labour, macrosomia, and fetal malpresentation (breech, brow, face and shoulder presentation) [4].

The number of caesarean sections has continued to increase worldwide in the last three decades [5]. WHO recommended guidelines stating that caesarean section birth rates should range between 5 and 15 percent, adding that rates lower than five percent reflect women's lack of access to life saving care and levels more than 15 percent carry no additional benefits to mother or newborn [6]. Generally there are few published data on caesarean delivery in Saudi Arabia. It has been shown in a population and hospital based studies of caesarean delivery rates in the 18 Arab countries, that Yemen, Mauritania, Sudan, and Algeria have a caesarean section rates below 5% [7], in a survey held in 2006 Iraq was found to have 20% caesarean section rate [5], another study held in Iraq in 2010 showed that the caesarean section rate was 62.2% [8]. Saudi Arabian culture, like most of countries in the region, encourages having a large family, and therefore, it is not uncommon for Saudi women to undergo six or seven caesarean section procedures [9]. In Brazil caesarean rate reached 32% [10]. In the USA and Canada, the national rates have reached almost 25% and 20% [11,12]. In Italy, the caesarean rate rose from 11% in 1980 to 17% in 1987 [13]. In United Kingdom the rate has reached 12% [13,14]. Also the rate had increased in countries, such as Sweden, Hungary, and Australia to more than 16 [15].

The complications of caesarean section are divided into short term and long term risks. The short term risks include infection, haemorrhage, urinary tract or bowel problems, venous thrombosis and embolism [16-18] whereas long term risk of morbidity significantly increases with the number of caesarean deliveries performed and it includes abnormal placentation, scar complications, uterine rupture and adhesions [19-22].

## **Aim of the Study**

The aim of our study is to determine the prevalence of caesarean section in King Abdulaziz university Hospital in Jeddah city and its indicating factors, to establish a data base of caesarean section that would help in further researches and to improve the quality of hospital care, and ensure a good health of mother and child in order to improve life.

## **Methodology**

**Study design and Study area:** The study is a retrospective descriptive study, relied on data collected through obstetric records. It was carried out by group of medical researchers, to determine the prevalence of caesarean section among pregnant women attended delivery at King Abdulaziz hospital in Jeddah city during 2016.

**Study population:** The study population included all pregnant women who were admitted to the obstetric department of King Abdulaziz university hospital for delivery and ended by cesarean section during the period of study from 1<sup>st</sup> of June to 31<sup>st</sup> of December 2016.

**Data collection and tools:** The data was collected by reviewing all records of pregnant women who attended delivery at KAUH and ended by caesarean section during the year 2016. By using check list filled from the patient’s file of admission that included the following information:

1. Personal data (maternal age, gestational age, gravidity and month of admission).
2. Types of abdominal and uterine incision.
3. Time of caesarean section.
4. The main indication for the caesarean section.
5. Fetal outcome.

**Data analysis:** The data then checked for completeness, coded then was entered into computer using statistical package for social sciences software program (SPSS version 19). The obtained data then analyzed using descriptive statistical tables (frequencies, percentages). Data present in tables and graphs by using computer applications (excel and word).

**Ethical consideration:** Approval of the project was obtained from King Abdulaziz University, College of Medicine, Department of Community Medicine. As well as approved by KAUH administration. We promised that the information kept in strictest confidence and used only for research purposes.

**Result**

From all the (5507) cases presented to the hospital for delivery in 2016, there were (754) cases ended with caesarean section, representing a percent of (13.7%), with a rate of (2.06) cesarean sections per day. The highest prevalence of cesarean section was in May (9.9%), followed by December and September which represent (9.7%) and (9.3%), respectively, and the lowest rates of CS were in February, April and July with 6.6%, 6.9% and 7.8%, respectively, the rates of CS in other months are showed in tables 1 and 2.

Year	Vaginal delivery		Caesarean section		Total
	No.	%	No.	%	
2016	4753	86.3	754	13.7	5507

**Table 1:** Distribution of cases according to type of delivery.

Month	Frequency	%
January	63	8.4
February	50	6.6
March	60	8.0
April	52	6.9
May	75	9.9
June	65	8.6
July	59	7.8
August	63	8.4
September	70	9.3
October	60	8.0
November	73	8.5
December	73	9.7
Total	754	100.0

**Table 2:** Prevalence of caesarean section in 2016.

The main indications of cesarean section are summarized in tables 3-5 we found that the order of most common indications in our study were as follow, maternal indications (44.90%), fetal indications (27.9%) then feto-maternal indications (27.2%). Failure to progress was the common indication among all indications (15.9%).

Main indication	Frequency	%
Previous one scar with prolonged pregnancy	37	4.9
Previous one scar with oligohydramnios	3	0.4
Previous one scar with failure of progress	116	15.4
Repeated scar	107	14.2
Sever preeclampsia	47	6.2
Eclampsia	6	0.8
Post myomectomy	1	0.1
Rupture uterus	3	0.4
Precious baby due to bad obstetric history or infertility	12	1.6
prolonged pregnancy with failure of induction	6	0.8
Total	339	44.9

**Table 3:** Maternal indications of cesarean section.

Main indication	Frequency	%
Fetal distress	44	5.8
Primi-breech	65	8.6
Transverse lie	10	1.3
Malposition	23	3.1
Pulsating cord prolapsed	8	1.1
Hydrocephalus	6	0.8
Sever oligohydramnios	17	2.3
Macrosomic baby (B. W more than 4 kg)	22	2.9
multiple gestations	15	2.0
Total	210	27.9

**Table 4:** The fetal indications of cesarean section.

Main indication	Frequency	%
Cephalopelvic disproportion	55	73
Failure to progress	120	15.9
Antepartum heamorrhage placenta previa	23	3.1
Antepartum heamorrhage abruptio placenta	8	1.1
Total	206	27.2

**Table 5:** The feto-maternal indications of cesarean section.

Table 6, shows that the vast majority of uterine incisions were done as lower segment cesarean section (LSCS) with percentage around (98.9), while classical incision percentage was around (1.1) only.

Uterine incision	Frequency	%
L.S.C.S	746	98.9
Classical	8	1.1
Total	339	44.9

**Table 6:** Distribution of cesarean section according to the Of uterine incision.

L.S.C.S: Lower segment cesarean section

Regarding the abdominal incision, the most used type of incision was Pfannenstiel incision with a rate of (96.2%), while longitudinal incision was around (3.8%) only, as shown in table 7.

Abdominal incision	Frequency	%
Pfannenstiel	725	96.2
Longitudinal	29	3.8
Total	754	100.0

**Table 7:** Distribution of cesarean section according to the abdominal incision.

About the distribution of caesarean section according to maternal age, we found that about (86%) of the women who underwent caesarean section were in the age between (20 - 35) years. Around 4% of women were under 20 years, and 9.4% of them were older than 35 years, as shown in table 8.

Age group	Frequency	%
< 20	30	4.0
20 - 35	653	86.6
> 35	71	9.4
Total	754	100.0

**Table 8:** Distribution of caesarean section according to age group.

In this study (63.5%) of cesarean sections were done as emergency, while (36.5%) were done as elective (Table 9).

Time	Frequency	%
Emergency	479	63.5
Elective	275	36.5
Total	754	100.0

**Table 9:** Distribution of cesarean section according to the time.

Regarding gravidity, about (30,8 %) of pregnant women were primigravida, while the others ranged between multi and grand multi-gravida (45.8%) (23.5%) respectively table 10.

Gravidity	Frequency	%
Primigravda	30	4.0
multigravda (2 - 4)	653	86.6
Grandmulti $\geq$ 5	71	9.4
Total	754	100.0

**Table 10:** Distribution of cesarean section according to number gravidity.

The fetal outcome was summarized in table 11; it was found that (97.1%) of babies were alive, (1.5%) dead and (1.5%) preterm.

The trend of caesarean section between (2011 - 2016) is shown in figure 1 which reached the highest percentage in 2011 (16.6%) and the lowest percentage in 2016 (13.7%). The trend was fluctuating between these values in the other years.

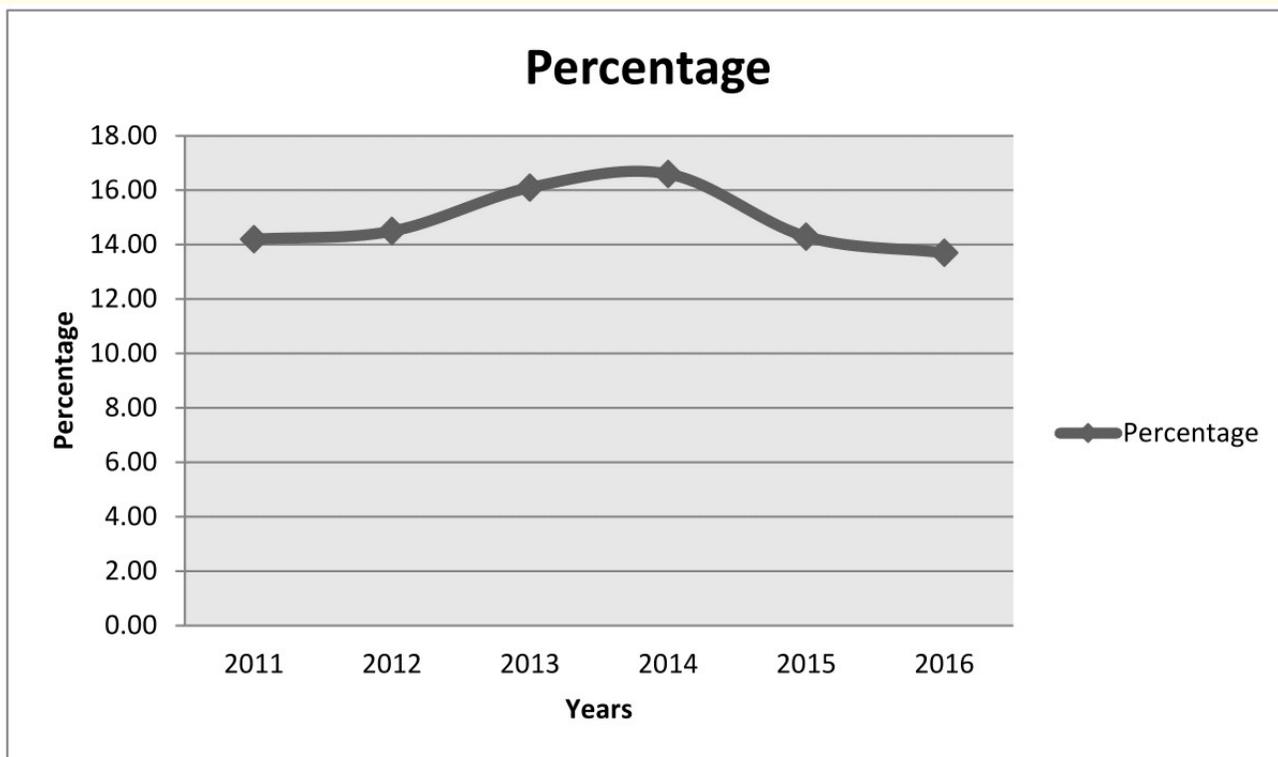


Figure 1: The trend of caesarean section from 2011 to 2016.

## Discussion

This study is focused on the prevalence of caesarean section and indicating factors among pregnant women attended KAUH in Jeddah city. In our study the rate of caesarean section was (13.7%), it was lower than other percentages reported by different studies found on the internet. However the united states' rate of caesarean section increased from (20%) to (24.4%) in 2001 [23], in Tanzania (2013) the percentage was (18%) [24], while a study in birjand city in Iran (2010) came up with the percentage of (49.8%) [25]. This is maybe attributed to multiple factors including continuous fetal monitoring (which is not available in Jeddah city), a lower obstetrical threshold for caesarean delivery because of decreased maternal surgical morbidity and because of increased medico-legal concerns in these countries compared to Jeddah city and Saudi Arabia.

Our study showed that the main maternal indication for caesarean section was previous scar with failure of progress (15.4%), this is similar to a study conducted in Iraq (2013), in which the main indication of caesarean section was repeated caesarean section (20.1%) [26]. Our result was in the contrast with the result of a study conducted in Tanzania (2013) in which the main indication was prolonged or obstructed labour (30%) [24]. This is maybe because most of deliveries in Tanzania happen at home and only reported to hospital when complicated or got prolonged.

Primi-breech fetus was the most common fetal indication of caesarean section in our study (30.8%), compared with (78%) of same indication in Iraq (2013) [26]. These differences are in part due to high public awareness regarding the maternal and peri-natal mortality and morbidity associated with vaginal breech deliveries.

When comparing the fetomaternal indications, cephalo-pelvic disproportion is the most common indication in Iraq (2013) [26], whereas failure to progress is the common one in our study.

There are researches that report "as maternal age increases spontaneous vaginal delivery rates fall", when compared with our study we found that the age group (from 20 to 35) years, has the highest caesarean section rate (86.6%). This is similar to a study done in India, that showed about (78.46%) of women underwent caesarean section were in the age group (between 21 and 30) years [27].

On the other hand, in Iraq (2013), about (41%) of those underwent caesarean section were aging between (36 - 45) years, in USA (2008) around (47.6%) of women underwent caesarean section aged 40 years or more [23], these studies differ from our study which has a rate of only (9.4%) caesarean section among women aging 35 years or more. This can be explained by the delayed age of marriage in these countries and the very younger age of marriage among Saudi girls.

Regarding type of caesarean section, our study showed that the vast majority was emergency caesarean (63.5%) this is supported by other study done in Hajjah, Yemen (2013) which revealed (79.3%) of caesarean sections were emergency [28].

Regarding gravidity, multigravida women were nearly half of our sample (45.8%), which is nearly the same in Indian study (2012) (56.38%) [27], in contrast to the Iraqi study which showed only (38%) of sample were multigravida women [27]. Primigravida women were (30.8%) of the sample in our study which is nearly similar to other studies, e.g.: study conducted in Egypt (2005) in which the percentage was (36%) [29].

The finding of the fetal outcome of our study showed that (97.1%) of babies were alive, similar to a study conducted in Jordan (2006) (90.4%) [30], however preterm babies were only (1.5%) of total number in our study and it is highly different from the study conducted in India (2012) which revealed (20%) [27]. This can be explained by the availability of high developed techniques and machines of detecting child and mother complications in India in contrast to KAUH, and availability of highly equipped centers that deal with preterm babies in India.

In our study and comparing with the results of previous years, we noticed that the rate of caesarean section has increased from 2011 to 2014, however, the rate started decreasing in 2015 and 2016. On the other hand the rate of caesarean section in the United States (2008) increased by 10.4% from 1996 to 2006 [23].

Although the King Abdulaziz university hospital in al mukalla city is the main hospital in the governorate, but we can't guarantee that our prevalence is the exact prevalence of caesarean section, because there may be rare cases that happened in private hospitals. So this study is more focused and exclusive to those who attended delivery in king Abdulaziz university Hospital. The study findings should be interpreted with caution as they may not be applicable to the whole community.

## **Conclusions**

Based in the finding of this study we conclude that:

- The rate of caesarean section in this study was 13.7%, and the most common indications of caesarean section were maternal indications, with failure to progress.
- The vast majority of caesarean incisions were lower segment uterine incision and Pfannenstiel abdominal incision.
- The majority of the women underwent caesarean section aged between (20-35) years old.
- The caesarean sections done as emergency was high.
- The grand multigravida took low percentage.
- The fetal outcome was good compared to other studies.

## **Recommendation**

We recommend a formal childbirth education for pregnant women to enhance childbirth preparation and empower women to cope with the changes and challenges of pregnancy and childbirth. We think providing psychological interventions, increase the quality of vaginal delivery services, appropriate culture, providing solutions and legislation which are preventing doctors from personal opinions can be an effective strategy to keep the CS rate within acceptable range.

## **Bibliography**

1. Caesarean section.
2. Philip N Baker. "Obstetric by ten teachers". 19<sup>th</sup> edition, UK, Hodder Arnold (2000): 234-295.
3. Richard Depp. "Caesarean delivery". In Gobbessonniebyl JR, and Simposon JL *Obstetric Normal and Problem pregnancies*. 4<sup>th</sup> edition. Churchill Livingstone (2002): 539- 581.
4. Kushtagi P and Guruvare S. "Documenting Indications of Caesarean Deliveries". *Postgraduate Medical Journal* 54.1 (2008): 52-53.
5. Utilization of services: Caesarean sections at Delivery.
6. Indicators to monitor maternal health goals. Report of a technical working group, 8-12 November 1993. Geneva, WHO (1994).
7. Rozzet J and Marwan K. "Caesarean section rates in the Arab region: a cross-national study". *Health Policy Plan* 19.2 (2004): 101-110.
8. Jabir M. "Risks of rising Cesarean section rates and means to decrease them".
9. Mesleh RA., *et al.* "Pregnancy outcome of patients with previous four or more caesarean sections". *Journal of Obstetrics and Gynaecology* 21.4 (2001): 355-357.
10. Notzon F. "International differences in the use of obstetric interventions". *Journal of the American Medical Association* 263.24 (1990): 3286-3291.
11. Boyers SP and Gilbert WM. "Elective repeat cesarean section versus trial of labor: the neonatologist's view". *Lancet* 351.9097 (1998): 155.
12. Macfarlane A and Chamberlain G. "What is happening to cesarean section rates?" *Lancet* 342.8878 (1993): 1005-1006.
13. Savage W and Francome C. "British cesarean section: have we reached a plateau?" *British Journal of Obstetrics and Gynaecology* 100.5 (1993): 493-496.
14. Treffers P. "The rising trend for cesarean birth". *British Medical Journal* 307.6911 (1993): 1017-1018.
15. Notzon F., *et al.* "Comparison of national cesarean rates". *New England Journal of Medicine* 316 (1987): 386-389.
16. Leth RA., *et al.* "Risk of selected postpartum infections after cesarean section compared with vaginal birth: a five-year cohort study of 32,468 women". *Acta Obstetrica et Gynecologica Scandinavica* 88.9 (2009): 976-983.
17. Mishra US and Ramanathan M. "Delivery Related Complications and Determinations of Caesarean Section Rate in India". *Health Policy and Planning* 17.1 (2002): 90-98.
18. Simpson EL., *et al.* "Venous thromboembolism in pregnancy and the puerperium: incidence and additional risk factors from a London perinatal database". *British Journal of Obstetrics and Gynaecology* 108.1 (2001): 56-60.

19. Clark EA and Silver RM. "Long-term maternal morbidity associated with repeat cesarean delivery". *American Journal of Obstetrics and Gynecology* 205.6 (2011): S2-S10.
20. Silver RM., *et al.* "Risk of placenta previa and accrete to number of previous cesarean deliveries". *Obstetrics and Gynecology* 107 (2006): 1226.
21. National Institutes of Health Consensus Development Conference Statement. NIH Consensus Development Conference: Vaginal Birth After Cesarean: New Insights (2010).
22. Spong CY., *et al.* "Risk of uterine rupture and adverse perinatal outcome at term after cesarean delivery". *Obstetrics and Gynecology* 110.4 (2007): 801-807.
23. MacDonnan F., *et al.* "Cesarean Birth in the United States: Epidemiology, Trends, and Outcomes". *Clinics in Perinatology* 35.2 (2008): 293-307.
24. Becherl L and Stokke S. "Indications for cesarean section in ST. Joseph medical hospital. Moshi, Tanzania" (2007): 20-25.
25. Masome Abdoli., *et al.* "Prevalence of cesarean section and related causes of in women referring to Vali-e-Asr and tamin -e-ejtemaee hospitals in Birjand, 2010". *Journal of Surgery and Trauma* 2.1 (2014): 25-28.
26. Adnan Habib H., *et al.* "Knowledge and Preference of Mothers Delivering at ALKadhumyia Teaching Hospital Regarding Caesarean Section and Normal Vaginal Delivery". *Iraqi Postgraduate Medical Journal* 10.4 (2011): 513-518.
27. Kaur Jaspinder., *et al.* "Current trend of caesarean sections and vaginal births". *Advances in Applied Science Research* 4.4 (2013): 198-202.
28. Al-Rukeimi A., *et al.* "Overuse of cesarean delivery at Al-Saudi Hospital, Hajah, Yemen". *Sudan Journal of Medical Sciences* 8.4 (2013): 186-188.
29. Labib NY., *et al.* "Cesarean Section Deliveries in One Health Insurance Hospital in Alexandria". *Gynecology and Obstetrics* 3 (2013): 212-218.
30. Hindawi IM and Meri ZB. "The Jordanian cesarean section rate". *Saudi Medical Journal* 25.11 (2004): 1631-1635.

**Volume 7 Issue 2 February 2018**

**©All rights reserved by Zakai Ghadeer H., *et al.***