Assessment of post abortion woman lifestyle

Amaal Ramadan[1], Kamelia Abo Shabana[2], Sahar Mossa[3]

[1] MD, Obstetrics &Gynecological Nursing, Faculty of Nursing ,Ain Shams University .

[2] Prof. of Obstetrics &Gynecological Nursing, Faculty of Nursing , Ain Shams University.

[3] Prof. of Obstetrics &Gynecological Nursing, Faculty of Nursing , Ain Shams University.

Abstract

Background: The present study was a descriptive study that aimed to assess of post abortion woman lifestyle. A Qausi-expermental sample that consisted of 116 post aborted women, the study was conducted at post natal room in AIN Shams University, maternity hospital. Data were collected using Arabic structured interviewing questionnaire sheet includes characteristics of the studied women; women knowledge regards abortion and management, lifestyle assessment tool. The results of this study revealed that more than half of women don't have knowledge regards abortion and its management, more over there was more than half of women had unhealthy lifestyle during pregnancy. It was concluded that the majority of the studied women had negative attitude toward the lifestyle meanwhile, there were many factors as age, work, family history, no. of abortion, unhealthy lifestyle behavior that effect on post aborted woman. It was recommended that providing further session, brochures, to increase women knowledge and awareness about effect of unhealthy lifestyle.

Key words: abortion, lifestyle.

Introduction

Abortion is defined as the termination of pregnancy and an expulsion from the uterus of an embryo or fetus before 20 week's gestation or fetal weight less than 500g **(Afshin A, 2016)**.

Approximately 26 million legal and 20 million illegal abortions are estimated worldwide in 2018, resulting in a worldwide abortion rate of 35 per 1,000 women aged 15-44. Other national data on legal abortions in 57 countries; estimates based on population surveys for two countries without official statistics and worldwide and regional estimates of unsafe abortion from the **(World Health Organization) 2018**. Abortion is one of the oldest medical practices, evidence of which dates back to ancient Egypt, Grieve, and Rome. Abortion techniques used by Egyptian pharaohs where documented in the ancient Ebbers Papyrus (1550 B.C). It is believed that during the Middle Ages, abortion techniques were adopted and accepted by Western Europe and later diffused across the globe **(WHO, 2018)**.

Most abortion happen when the unborn baby has fatal genetic problems. Usually, these problems are unrelated to the mother. Other causes of abortion include, Infection, Medical conditions in the mother. **(Andaroon, Nafise, 2017)**.

Complications are much more common. Some women seeking

subsequent care may be seriously ill and need immediate emergency attention for life-threatening conditions (**Dwar RB, 2016**).

Meanwhile Lifestyle is defined as The set of habits and customs that is influenced by the lifelong process of socialization, including social use of substances such as alcohol and tobacco, dietary habits, and exercise, all of which have important dangers implications for health,. While factors like maternal nutritional status, disease control and reproductive planning are critical in ensuring a healthy pregnancy outcome for women and their future offspring, exposure to drugs and chemicals play a significant role as well. Alcohol, smoking, caffeine use and other similar lifestyle factors, have now become an integral part of the daily life of most men and women, who use/misuse one or more of these harmful substances regularly despite knowledge of their detrimental effects. **(Jamie Kulzer, 2018).**

Lifestyle-Associated Factors to abortion that are many factors related lifestyle that is leads to abortion, it is known that smoking during pregnancy is harmful not only to smokers but also to the fetus. A number of studies have reported that active smoking and passive smoking among pregnant women is a major cause of abortion, premature births, stillbirths, and many other complications such as placenta Previa, placental abruption, and a shorter gestation period. **(Atrash, 2016).**

While factors like maternal nutritional status, disease control and reproductive planning are critical in ensuring a healthy pregnancy outcome for women and their future offspring, exposure to drugs and chemicals play a significant role as well. Alcohol, smoking,

caffeine use and other similar lifestyle factors, have now become an integral part of the daily life of most men and women, who use/misuse one or more of these harmful substances regularly despite knowledge of their detrimental effects. Exposure to reproductive and developmental toxicants in the environment (at home and at the workplace) are concern. The adverse health outcomes of these exposures are of interventions for avoiding the usage of caffeine, tobacco, alcohol and other illicit drugs; and avoid exposure to environmental or workplace chemicals and avoid radiation **(Ballen, 2016).**

Maternity nurse is a core stone for woman and fetus health services from primary to tertiary level of prevention. Nurses interact daily with aborted woman to offer accurate information about abortion and its effect on lifestyle. counseling for abortion information, health and unhealthy lifestyle through post abortion time; decision making to promote and participate in successful interventions during post abortion which promote positive health behaviors and reduce health risks through multiple roles as (a counselor, educator, manager, care provider and researcher) **(Floyd RL, 2017).**

Significance of the study:

Post abortion period is very important time for woman it can effect on woman and her family, nurses played a multi-disciplinary role during post abortion as a direct care providers, manager, educator, counselor, and as researcher to promote post abortion woman health which sequentially had reflected bone minimizing mortality and morbidity, correcting misconceptions and ill health behaviors post abortion among patient.

As well as improving woman lifestyle post abortion.

Aim of the Study:

This study is aimed to Assessing post abortion women knowledge about abortion & its management, Assessment of woman health needs and problems for post abortion women and assess woman life style.

Subjects and Methods

Technical design

The technical design includes research design, setting, subject and tools of data collection**.**

Research design

Qausi-expermental research was conducted for this study.

Research setting

The study was conducted at post natal room in AIN Shams University, maternity hospital.

Research subjects

Purposive simple random sample was obtained from the previous mentioned setting; the sample size was calculated by power analysis, which based on statistical flow rate for aborted women in 2016-2017 year who is attended in theater room at Ain Shams University maternity hospital. The size was 116 aborted women that represented 10 % of total number (1160).

Tools and technique of data collection

Data required for the current study were collected using the following tools:

(I) Pre-designed Questionnaire Sheet:

1. Arabic Structured interviewing questionnaire sheet: (Appendix II):

Constructed by the researcher after reviewing advanced of literature related to study topic, putting into considerations the aim of the study and the data needed to be collected from the study subjects. It consists of 35 questions (open and closed questions) divided into Three parts:

Part (A): General Characteristic of the study sample which included (questions 1-4):

This part was concerned with general characteristics such as age, marital status, and educational level, type of occupation and area of resident**.**

Part (B): Which included (5-10 question):

It was concerned related to past history as any chronic disease, allergy from any medication, and presence of fibroid tumor, etc.

Part (C): (11-12 questions):

It was concerned with family history as complaining from any chronic disease, complaining from autoimmune diseases.

- Tool (II) Woman's knowledge regards abortion and management involved (7 questions): (Appendix III).

Designed by (Walsh et al.,2016) this tool was translated into simple Arabic language to assess woman's knowledge

regards abortion meaning, signs and symptoms, causes of abortion, types of abortion, predisposing factors, complications, management of abortion. Each question was evaluated as complete answer score 2, average answer score 1, incomplete answer score zero. as while total correct answer was more 70%, while average answer from 50 to 69, while the total incorrect less than 50%. This tool was utilized pre intervention, four weeks and 8 wks. Post intervention.

3- Lifestyle assessment tool: (Appendix IV)

It was included (12- statements) it designed by the researchers and was used to assess the lifestyle during pregnancy and post abortion. The tool which included all lifestyle during pregnancy as junk food style, smoking, addiction to caffeine or alcohol, hard worker, obesity during pregnancy high temperature, using of creams or herbal methods during intercourse, exposure to radiation, sleeping hours, gym exercises. Each question was as each statement evaluated as yes or no yeas for health and no for un healthy lifestyle.

Scoring system for the knowledge questions:

Each knowledge assessment item (7questions) was given:

Complete correct answer 3 grades, Incomplete answer 2 grade, Incorrect answer 1 grade

Total score as follows:

- Satisfied knowledge indicated above (70%).

- Average knowledge indicated from (50-70%).

- Unsatisfied knowledge indicated less than (50%).

Validity and Reliability:-

Tools of data collection used in the study are standardized tool with no modifications or translation.

Ethical Consideration

An official approval was carried out from The Scientific Research Ethics Committee Faculty of Nursing, Aim Shams University before conducting of the study. A written consent was obtained from the studied women. The researcher explained the aim of the study to the studied students who accepted to be enrolled in the study. Each woman was informed that she has the right to drop out / withdraw at any time without any restrictions. Anonymity, confidentiality, beneficence, research purpose only, respect and justice all of these ethical consideration principles taking into consideration while conducting this research study.

Statistical design

The collected data were organized, revised, tabulated, and analyzed. Computer using statistical package of social science (SPSS 20) did statistical analysis. The suitable statistical tests were used to determine whether there was a significant statistical difference between study variables or not.

Results

Table (1): showed that (37.9%) of the studied subject were aged from (35-40

y.). and (34.5%) of them illiterate, while half of studied subject, (50.8%) had low income, almost three quarters (71.6%) of them worked.

It was clarified from this figure that more than half (55%) of studied subject delivered more than one before.

Figure (1): No. of Abortion among the studied subjects (N= 116).

Table (2): Concerning to the studied subject knowledge about abortion and its management table (2) clarified that more than half of women (51.7%) don't know abortion definition, more than

two thirds (87.9%) don't know the complications of abortion, In addition more half don't know the guidance and supporting of abortion.

Figure (2): Presented that more than half (60%) of studied subject had total dissatisfied knowledge related to abortion.

Table (3): clarifies that, there were more than half of women (69%) smoking during pregnancy, (72%) consuming caffeine, In addition more than half of women (67%) hard workers. There were more than half of studied subject (54%) had unhealthy lifestyle during pregnancy.

Table (1): Characteristics of the studied subjects (N= 116).

Item	N	%
Age		
• 20 < 25 years old	38	32.7
• 25 < 30 years old	15	13
• 30 < 35 years old	19	16.4
• 35 ≤ 40 years old	44	37.9
$\bar{x} \pm SD\ 30.5 \pm 7.5$		
Education		
• Illiterate	40	34.5
• Primary	20	16.2
• Secondary	30	25.9
• University	26	22.4
Income		
• 1000 < 1500	59	50.8
• 1500 < 2000	21	18.2
• 2000 < 2500	19	16.4
• 2500 ≤ 3000	17	14.6
$\bar{x} \pm SD\ 1666.3 \pm 591.3$		
Work		
• Work	83	71.6
• Not work	33	28.4
Type of work		
• Office work	10	8.6
• Practical Work	60	51.7
• Technical Work	46	39.7

Regarding the characteristics of the studied subjects

NO. OF ABORTION AMONG THE STUDIED SUBJECTS

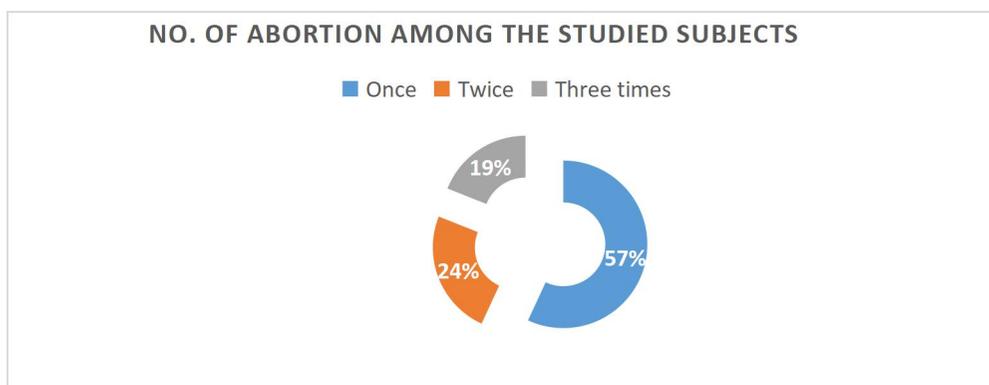■ Once ■ Twice ■ Three times

19%

24%

57%

Figure (1): This figure clarified that more than half of studied subject aborted three times before.

Table (2): Knowledge of the studied subjects related to abortion (N= 116).

Item	Satisfied		Average		Dissatisfied	
	N	%	N	%	N	%
Abortion definition	16	13.8	40	34.5	60	51.7
Causes of abortion	30	25.9	20	17.2	66	56.9
Types of abortion	24	20.7	4	3.4	88	75.9
Abortion risk factors	24	20.7	37	32.9	55	47.4
Complications of abortion	4	3.4	10	8.6	102	87.9
Treatment regimen of abortion	24	20.7	40	34.5	52	44.8
Guidance and supporting for abortion	20	17.2	26	22.4	70	60.4
Total	20	17.2	26	22.4	70	60.4

Total Knowledge of the studied subjects related to abortion

Satisfied
17%

Dissatisfied
60%

Average
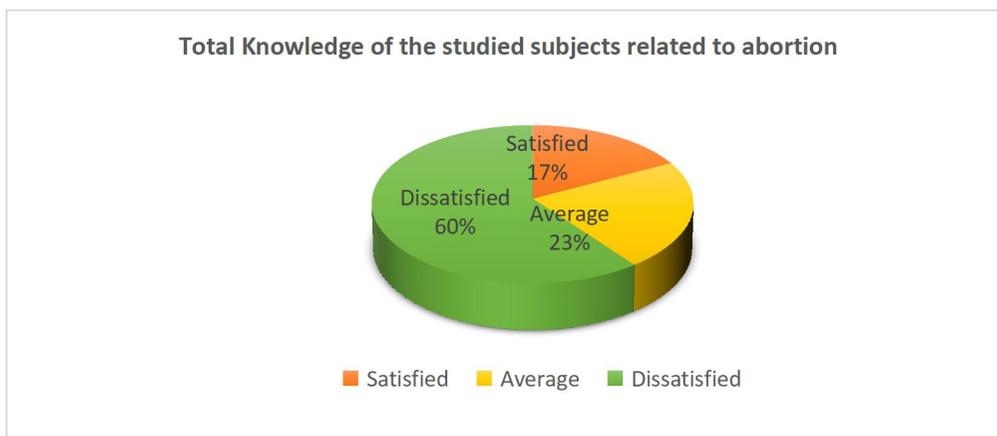23%

■ Satisfied ■ Average ■ Dissatisfied

Figure (2): Total of studied subjects' knowledge related to abortion (N= 116).

Table (3): Studied subjects' lifestyle (N= 116).

Item	Healthy life style		Unhealthy life style	
	N	%	N	%
Smoking	36	31	80	69
Drinking Alcohol	116	100	0	0
Drinking \ consuming caffeine	32	27.6	84	72.4
Hard working life style	38	32.8	78	67.2
Over weight	61	52.6	55	47.4
Exposing to high temperature	112	96.6	4	3.4
Eating junk food	30	25.9	86	74.1
Practicing exercises	10	8.6	106	91.4
Sleeping enough	42	36.2	74	63.8
Total	53	45.7	63	54.3

Discussion

Fears about the impact of abortion and their family are generating alarm and serious complications plus, the evidence is mounting that a high problems during post abortion period increases risk of emotional, physical, psychological problems so performing proper counseling regard lifestyle especially exercise, nutrition, sleeping, care, addiction, family planning is the main keys for reducing post abortion complications. **(Nazario, 2017).**

So the researcher suggested the present study to assess the effect of post abortion counseling and its effect on woman lifestyle has many challenges regarding aborted women and has few statistics regard it.

Eat healthy, good rest, good hygiene, prober management, prober emotional support and lifestyle healthy' is the essential requirements for long life. Unfortunately, today's world has been adapted to a system of counseling which has several effects on health. Lifestyle changes has compelled us so much that one has so little time to really think what we are eating, sleeping, hygiene, working is right! National and international have greatly affected ones counseling and forced many governmental and privet hospital to implement post abortion counseling. **(Wilson, 2017).**

As per **Montgomery (2016)** Instead of following an outdated approach focused on the prevention of post-abortion emotional squeal and the provision of decision-making support that used to be more common until the early, Research has shown that most women do not exhibit post-abortion emotional sequel, except in specific situations related either to individual characteristics or particular life circumstances.

Mothers who can be addicted to drugs, cigarettes, alcohol, caffeine, and many other things. When somebody is addicted to something, they can become sick if they do not get the thing they are addicted to. But taking more of the thing they are addicted to can also hurt their health and make problems such as pregnancy loss (**Oken et al., 2017**).

Obesity has increased dramatically over the last few years and needs to be tackled urgently," says **Dr Pat Goodwin, (2017).** Head of Pathogens, Immunology and Population Health at the Welcome Trust. "This study supports the idea that

there are many different risk factors that can lead to someone being overweight and developing related health problems such as abortion. Pregnancy can be a difficult time for many mothers, but it is important that they are aware that what they eat may affect negatively.

This study partially depicts what the assessment of post abortion women lifestyle. It would be interesting to replicate the investigation in other regions of the country, especially rural areas, where things may be different. Given the fact that the study is based on an account of what abortion, post abortion is and not on its direct observation, the results may not reflect the reality. **(Wilson, 2016).**

The present study that revealed the prevalence of smoking increased between women with high standard, workers and urban neighborhoods this result disagree with study done by **(Michael and Brown et al., 20017).** He found the Prevalence of smoking in low-income urban neighborhoods.

The present study that revealed the expansion of the chemical industry is accompanied by growing concerns over associated health hazards. Purposive sample studies show a positive association between the abortion and with state-level of work finding was on the same line with a study done by **(Maddock, 2016).**

If the unhealthy part of the lifestyle space represents the more 'risky' space then why is it generally occupied by As a final rejoinder to those who doubt the prevalence of class oriented culture and assume that the working classes lead unhealthy lives more frequently because of ignorance and a lack of education **(Ely, 2014)**

Investigating knowledge level about lifestyle counseling for post abortion woman, the present study showed that more than half of women had incorrect knowledge level regarding health lifestyle. Moreover, these results were in accordance with a study done by **(Majane et al, 2017).** He found that level were mostly affected of low educated mother Furthermore, it showed increase health impact in relation to education rather than women with correct knowledge about lifestyle.

Previous studies have found that social behaviors can be primed by environmental cause. For example,

Exposure to radiation of an worker woman in medical field led to pregnancy loss **(Aarts & Dijksterhuis, 2015).**

Another important aspect is that there were some Socio-demographic variables that include gender, age, level of education, employment status, profession he house and living arrangements. The last three variables were used as potential measures of prevalence on abortion **(By Kumarapeli et al., 2016).**

Limitation of the study

Limitation of this study has similar limitations with other studies in this field: generalization of the study findings is limited because of convenient sampling methods. Hesitancy by participants to disclose the truth in fear of repercussions or in attempts to make oneself look good contributes to response bias. In an attempt to minimize the response bias limitation, the researcher emphasized to participants that the purpose of the study was for exploration of the topic, and understanding the nature of academic dishonesty among

postgraduate nursing students as a whole, was the focus of the study.

Conclusion

More than half of the studied sample developed poor knowledge regarding to abortion and its management, more than half of the studied sample aborted three times before, more than one third of the studied sample developed in complete knowledge regarding to healthy lifestyle, Half of the studied sample developed health problems in relation to lifestyle.

Recommendations

Based on the study findings the following recommendations are suggested:

- The government could also take an active role in litigation against Corporations responsible for illegal pregnancy.

- Further research through studying the effect of life style modification on post abortion out come

- Services most often recommended included psycho education about the emotional component of abortion and referrals to counseling, support groups, and other resources for obtaining emotional support and connecting to others who have experienced abortion.

- There is a clear need for increased research on the efficacy of interventions and programs that seek to post-abortion woman in order to inform the establishment of best practices for post-abortion care.

- Conduct rigorous evaluations with research designs that can provide

conclusive evidence about the impact of post-abortion services in low income countries and measure outcomes of importance, such as repeated abortions, unplanned pregnancies, use and type of contraceptive and unhealthy lifestyle.

References

Afshin A, Babalola D, Mclean M, Yu Z, Ma W, Chen CY, Arabi M, Mozaffarian D. (2016). "Information technology and lifestyle: a systematic evaluation of internet and mobile interventions for improving diet, physical activity, obesity, tobacco, and alcohol use." Journal of the American Heart Association, 5(9), e003058.

Aittasalo, M., Pasanen, M., Fogelholm, M., Kinnunen, T. I., Ojala, K., & Luoto, R. (2016). Physical activity counseling in maternity and child health care–a controlled trial. BMC women's health, 8(1), 1-9.

Aittasalo, M., Pasanen, M., Fogelholm, M., Kinnunen, T. I., Ojala, K., & Luoto, R. (2015). Physical activity counseling in maternity and child health care–a controlled trial. BMC women's health, 8(1), 1-9.

Aittasalo, M., Raitanen, J., Kinnunen, T. I., Ojala, K., Kolu, P., & Luoto, R. (2014). Is intensive counseling in maternity care feasible and effective in promoting physical activity among women at risk for gestational diabetes? Secondary analysis of a cluster randomized NELLI study in Finland. International Journal of Behavioral Nutrition and Physical Activity, 9(1), 104.

Andaroon, Nafise, et al. (2017). "The effect of individual counseling program by a midwife on fear of childbirth in primiparous women." Journal of education and health promotion, 6.

Antonucci, Toni C., Kristine J. Ajrouch, and Jasmine A. Manalel. (2017):"Social relations and technology: Continuity, context, and change." Innovation in aging 1.3: igx029.

Armstrong, Susan J., Laetitia C. Rispel, and Loveday Penn-Kekana. (2016) "The activities of hospital nursing unit managers and quality of patient care in South African hospitals: a paradox?" Global health action 8.1: 26243.

Atrash, Hani K., and Carol J. Rowland Hogue. (2016) "11 The effect of pregnancy termination on future reproduction." Baillière's clinical obstetrics and gynaecology 4(2): 391-405.

Ballen, Lois Eve, and Ann J. Fulcher. (2016) "Nurses and doulas: complementary roles to provide optimal maternity care." Journal of Obstetric, Gynecologic, & Neonatal Nursing 35(2): 304-311.

Barber, Jacques P., et al. (2013)"Supportive techniques: are they found in different therapies?." The Journal of psychotherapy practice and research 10(3): 165.

Barr, J., Fraser, G. L., Puntillo, K., Ely, E. W., Gélinas, C., Dasta, J. F., ... & Coursin, D. B. (2014). Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Critical care medicine, 41(1), 263-306.

Beck, Kelly, and Jamie Kulzer. (2018) "Teaching and Improving Clinical Counseling Skills: Teaching Counseling Microskills to Audiology Students: Recommendations from Professional Counseling Educators." Seminars in Hearing. Vol. 39. No. 1. Thieme Medical Publishers.

Beja, Vanda, and Isabel Leal. (2015) "Abortion counselling according to healthcare providers: a qualitative study in the Lisbon metropolitan area, Portugal." The European Journal of Contraception & Reproductive Health Care 15(5): 326-335.

Bender, Sóley S., and Reynir T. Geirsson. (2014): "Effectiveness of preabortion counseling on postabortion contraceptive use." Contraception 69(6) 481-487.

Berer, M. (2017). Abortion law and policy around the world: in search of decriminalization. Health and human rights, 19(1), 13.

Biesecker, Barbara, Jehannine Austin, and Colleen Caleshu. (2017): "Theories for psychotherapeutic genetic counseling: Fuzzy trace theory and cognitive behavior theory." Journal of genetic counseling 26(2) 322-330.

Biggs, M. A., Upadhyay, U. D., Steinberg, J. R., & Foster, D. G. (2014). Does abortion reduce self-esteem and life satisfaction?. Quality of Life Research, 23(9), 2505-2513.

Bodai, B. I., Nakata, T. E., Wong, W. T., Clark, D. R., Lawenda, S., Tsou, C., ... & Ha, B. P. (2018). Lifestyle medicine: A brief review of its dramatic impact on health and survival. The Permanente Journal, 22.

Brown, Bonnie. (2015) "Maternity-Patient Teaching—A Nursing Priority." Journal of Obstetric, Gynecologic, & Neonatal Nursing 11(1) 11-14.

Brown, S. S., & Eisenberg, L. (2014). Unintended pregnancy and the well-being of children and families. JAMA, 274(17), 1332-1332.

Buchbinder, M., Lassiter, D., Mercier, R., Bryant, A., & Lyerly, A. D. (2016). Reframing conscientious care: providing abortion care when law and conscience collide. Hastings Center Report, 46(2), 22-30.

Budin, Wendy C. (2014) "The future of nursing: Implications for childbirth educators. Quality of Life Research, 59-61.

Campbell, Janet E. (2013) "A role for nurse psychotherapists: primary prevention counseling for general hospital staffs." Perspectives in psychiatric care 23(3), 85-90.

Carroll, J. K., Flocke, S. A., Sanders, M. R., Lowenstein, L., Fiscella, K., & Epstein, R. M. (2016). Effectiveness of a clinician intervention to improve physical activity discussions in underserved adults. Family practice, 33(5), 488-491.

Carta, M. G., Petretto, D., Adamo, S., Bhat, K. M., Lecca, M. E., Mura, G. I. O. I. A., ... & Moro, M. F. (2012). Counseling in primary care improves depression and quality of life. Clinical Practice and Epidemiology in Mental Health: CP & EMH, 8, 152.

Cartwright, A. F., Karunaratne, M., Barr-Walker, J., Johns, N. E., & Upadhyay, U. D. (2018). Identifying national availability of abortion care and distance from major US cities: systematic online search. Journal of medical Internet research, 20(5), e186.

Center for Substance Abuse Treatment. (2015). 6 Group Leadership, Concepts, and Techniques. In Substance Abuse Treatment: Group Therapy. Substance Abuse and Mental Health Services Administration (US).

Ceylan, A., Ertem, M., Saka, G., & Akdeniz, N. (2015). b

Chen A, Feresu SA, Fernandez C et al. (2009): Maternal obesity and the risk of infant death in the United States. Epidemiology 20: 82–83.

Coast E and Murray SF. (2016): "These things are dangerous": understanding induced abortion trajectories in urban Zambia. Soc Sci Med. 2016; 153: 201-209.

Curtis C, Huber D and Moss-Knight T. (2017): Post abortion counseling: addressing the cycle of repeat unintended pregnancy and abortion. Int Perspect Sex Reprod Health. 2017; 36; 1: 44-48.

De Jong-Potjer LC, Elsinga J, Le Cessie S, et al (2018). Future mother's knowledge of abortion-related risk factors: The need for counseling care.

Dipietro JA. (2008): Fetal responses to induced marernal relaxation during pregnancy. Biological psychology, 77 (1), 11-19.

Dwar RB and Kreuter MW (2015): Performing the case for health promotion. 2 (4): 103-118.

Edwards TA, Thompson HS, Kwate NO, et al. (2016). Association between temporal orientation and attitudes about BRCA1/2 testing among women of African descent with family histories of recurrence abortion. Patient Educ Couns;72:276–82.

Floyd RL, Rimer BK, Giovino GA, et al. (2017). A review of smoking in pregnancy: Effects on pregnancy outcomes and cessation efforts.

Annual Review of Public Health, 14, 379–411.

Fucic A, FancoMerlo D, Ceppi M, et al. (2017): Spontaneous abortions in female populations occupationally exposed to radiation. Int Archives Occup Environ Health;81 (7):873-879

Ganatra B, Tuncalp O, Johnston HB, et al. (2018): From concept to measurement: operationalizing WHO's definition of **abortion**. Bull World Health Organ (2018); 92; 3: 155.

Garssen J and Van der Meulen A (2017). abortion mortality and morbedity. Backgrounds of a worsening international ranking. Demographic Research, 11, 357–394.

Gerhard I, Waibel S, Daniel V, et al. (2017). Impact of heavy metals on hormonal and immunological factors in women with repeated miscarriages. Human Reprod Update;4 (3): 301-309.