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Review Article

The Acceptability of Implanon in Muslim-Majority Asian Countries: A Systematic Review

Nik Asyraf Nik Azis [1], Mohamed S. Zulfarina [2], Nurul 'Izzah Ibrahim [2], Alia Syamim Zahari [1], Aisyah Sulaiman [1], Ng Xue Min [1], Azura Abdullah [1], Alina Ali [1], Norhalili Mohamad Tamiri [1], *Isa Naina-Mohamed [2]

1. *National Population and Family Development Board (LPPKN), No 12B, Jalan Raja Laut, Chow Kit, 50350 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia*
2. *Department. of Pharmacology, Medical Faculty, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia*

***Corresponding Author:** Email: isanaina@hctm.ukm.edu.my

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Abstract

Background: We conducted a systematic review which aimed to assess acceptability of implanon used based on reported side effects, continuation rates and user satisfaction in Muslim-majority Asian countries.

Methods: We followed PRISMA guideline and searched SCOPUS and Medline databases for original articles that dealt with implanon, conducted in Muslim-majority Asian countries and had either continuation rates or side effects or satisfaction rate. The risk of bias of the selected studies was assessed using ROBINS-I V2 Risk of Bias tool.

Results: The literature search successfully identified 7 potentially relevant articles, whereby 5 of them met the inclusion criteria. 5 articles were retained in the final synthesis with 619 total participants. Implanon's documented side effects such as menstrual irregularity and weight gain, is tolerable due to its high efficacy. Implanon has low discontinuation rates among users and has a high satisfaction rate.

Conclusion: Implanon is widely accepted in Muslim-majority Asian countries with a positive impact on family planning.

Keywords: Implanon; Contraception; Acceptability; Muslim; Asia

Introduction

Contraception is defined as the use of any of various methods intended to prevent a woman becoming pregnant (1). Most methods of contraception are reversible, apart from undergoing a vasectomy or tubal ligation.

As the world economy struggles to recover from the COVID-19 pandemic, many young couples are delaying having children to reduce additional childcare expenditure. Providing an adequate time gap between children ensures each child gets adequate attention. In addition, contraception gives lactating mothers the opportunity to breastfeed peacefully for the recommended first 2 years.

The existence of national birth control programs such as China's One Child Policy (2) and Singapore's Two Child Policy (3) have raised awareness of the macro-economics of population

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growth in relation to the nation's growth and development. Young couples are under the impression that having fewer children is more socially acceptable, thus encouraging them to seek contraception.

Besides pregnancy prevention, contraceptives also have other medical uses, such as to curb the spread of sexually transmitted diseases (STD's), for menstrual regulation and to treat endometriosis.

There is an unmet need for contraception globally, with an estimated 40% of pregnancies unintended worldwide (4). There is a need for contraception among women of childbearing age to have better spacing of at least 18 months, thereby reducing risks of maternal complications such as uterine rupture (5). Maternal mortality and morbidity reduction is also one of the goals in the Sustainable Development Goals (SDG) as outlined by WHO (6).

Many factors can influence the choice and acceptability of a method of contraception such as the ease of use, impact on intimacy, convenience, costs, and the attitudes of healthcare professionals (4). Some women would prefer a painless method such as oral contraceptive pills, which require strict compliance to a daily regime, while other women would prefer the temporary pain of an injection or procedure and then not having to worry about contraception for a longer duration. Long-acting reversible contraceptives (LARC) such as the IUCD or Subdermal Implants such as Implanon, are known for having high efficacy and long duration of action (3-5 years depending on device) (7).

Implanon is a single matchstick sized (4 cm long, 2 mm in diameter) ethylene vinyl acetate (EVA) rod containing 68mg of etonogestrel (3-ketodesogestrel). It is inserted in the subdermal layer in the inner arm. It continuously releases etonogestrel. Its primary mechanism of action is the inhibition of ovulation (7). It has a Pearl index of 0.031 (8), is easily inserted and removed, and is effective for up to 3 years.

Implanon has a few known side effects such as menstrual irregularities, weight gain, acne and emotional lability (9-15). Studies demonstrated that menstrual irregularity is the main reason for early discontinuation of implanon among women (12,13,15). Weight gain is also a cause for concern among implanon users with many studies showing an increase in Body Mass Index (BMI) (9-15).

It is estimated that out of the world population of 6.8 billion people, 1.57 billion, or 1 in 4, are Muslims (16). The majority of Muslims, 69% or roughly 1.14 billion people, reside in Asia (17). Kettani (17) identified 24 Muslim majority countries that are in Asia. Muslims make up 27.5% of the Asian population (17). Women's knowledge, belief and perception of health risk also influences contraceptive choice (4). For example, according to Islamic belief, a woman who is having her menses is not allowed to pray the 5 daily prayers due to being in a state of impurity (18). Women on their menses are also advised for abstinence from sexual activity (18). This inconveniences Muslim women and may affect the acceptability of implanon among Muslims since implanon has a known side effect of menstrual irregularity. However, through their research, Salako (19) and Salwani & Ismail (20) concluded that implanon is permissible in the Islamic religion.

Majma 'al-Fiqh al-Islami Conference under the Organization of Islamic Cooperation (OIC) in Kuwait on 15 Dec 1988 has decided that it is permissible to control the ability of reproduction (not permanent) with the purpose of distancing the time between pregnancies, stopping it for a certain period of time, if there is a necessity for it, and with the agreement of both the husband and wife, on the condition that the intervention method is not harmful, as well as it is not harmful towards the existing child in the mother's womb (21).

Early posters depicting implanon in South East Asia used the word 'Susuk' to describe it. 'Susuk' is an old belief whereby objects like iron, diamonds or pearls are inserted in different parts of the body to make the person more beautiful, attractive, and strong or even immune (20). It is associated with witchcraft, which is forbidden in Islam. However, Salwani & Ismail (20) explained that the use of implanon is rooted in science and

not superstitious belief, therefore its use is permitted in Islam. This small misunderstanding may affect the acceptability of implanon among South East Asian Muslims.

The acceptability of contraception, especially implanon subdermal contraceptive implant, is not well documented among the Muslim population in Asia. Thus, to fill this knowledge gap, our systematic review aimed to assess the acceptability of implanon among the Muslim majority countries in Asia.

Materials and Methods

Search strategy

A computerized literature search was conducted to identify studies, which linked implanon with Asian Muslim-majority countries. A list of 24 majority-Muslim Asian countries was extracted from (17) (Table 1).

Table 1: Majority-Muslim Asian Countries

Asian countries with majority Muslim Population (%)			
1.	Brunei (67)	13.	Turkmenistan (89)
2.	Indonesia (88.2)	14.	Uzbekistan (91)
3.	Malaysia (60.3)	15.	Bahrain (81)
4.	Bangladesh (89.5)	16.	Iraq (95)
5.	Maldives (100)	17.	Jordan (95.4)
6.	Pakistan (96.5)	18.	Kuwait (91.5)
7.	Afghanistan (99.7)	19.	Qatar (77.5)
8.	Azerbaijan (96)	20.	Saudi Arabia (95)
9.	Iran (99.5)	21.	Syria (87)
10.	Kazakhstan (70)	22.	Turkey (99.1)
11.	Kyrgyzstan (80)	23.	United Arab Emirates (96)
12.	Tajikistan (97)	24.	Yemen (99.9)

Database search commenced on 21 May 2024 focusing on 2 databases, which were SCOPUS and Medline via Ovid (Table 2). Selected articles were published between 1946 to Jan 2024 with either one of the following keywords:

1. Implanon
2. Subdermal Contraception
3. Contraceptive Implant

Truncation was used for the terms "Subdermal contracept*" and "contracept* implant*". Then, Boolean operator AND was used to link the three keywords with the countries in Table 1.

Table 2: Search Strategy Algorithm

Database	Search Strategy Algorithm
SCOPUS	Each country in Table 1 was searched individually Boolean operator OR was used to combine the search results for all countries in '1' Keywords were searched: Implanon, Subdermal contracept*, contracept* implant* Boolean operator OR was used to combine search results in '3'. Boolean operator AND was used to combine search results in '2' and '4'
Medline via Ovid	Each country in Table 1 was searched individually Boolean operator OR was used to combine the search results for all countries in '1' Keywords were searched: Implanon, Subdermal contracept*, contracept* implant* Boolean operator OR was used to combine search results in '3'. Boolean operator AND was used to combine search results in '2' and '4'

Selection of Research Articles

Our search was limited to only studies published in English due to funding constraints, which limit the option of translation services. Inclusion criteria are: 1) original research articles 2) must include implanon 3) Conducted in Asian Majority-Muslim countries 4) must have either side effects or continuation rates or satisfaction rate of implanon.

While studies that were 1) manuscripts, letters to the author, editorials, study protocols, case studies/reports and review articles 2) focused on other subdermal contraceptives like Norplant, Femplant and Sino (II) 3) did not include side effects or continuation rates or satisfaction rate of implanon were excluded from the review. Reference search was conducted with no extra articles included in the review.

Study Selection Procedure

The study adhered to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines as shown in Fig. 1.

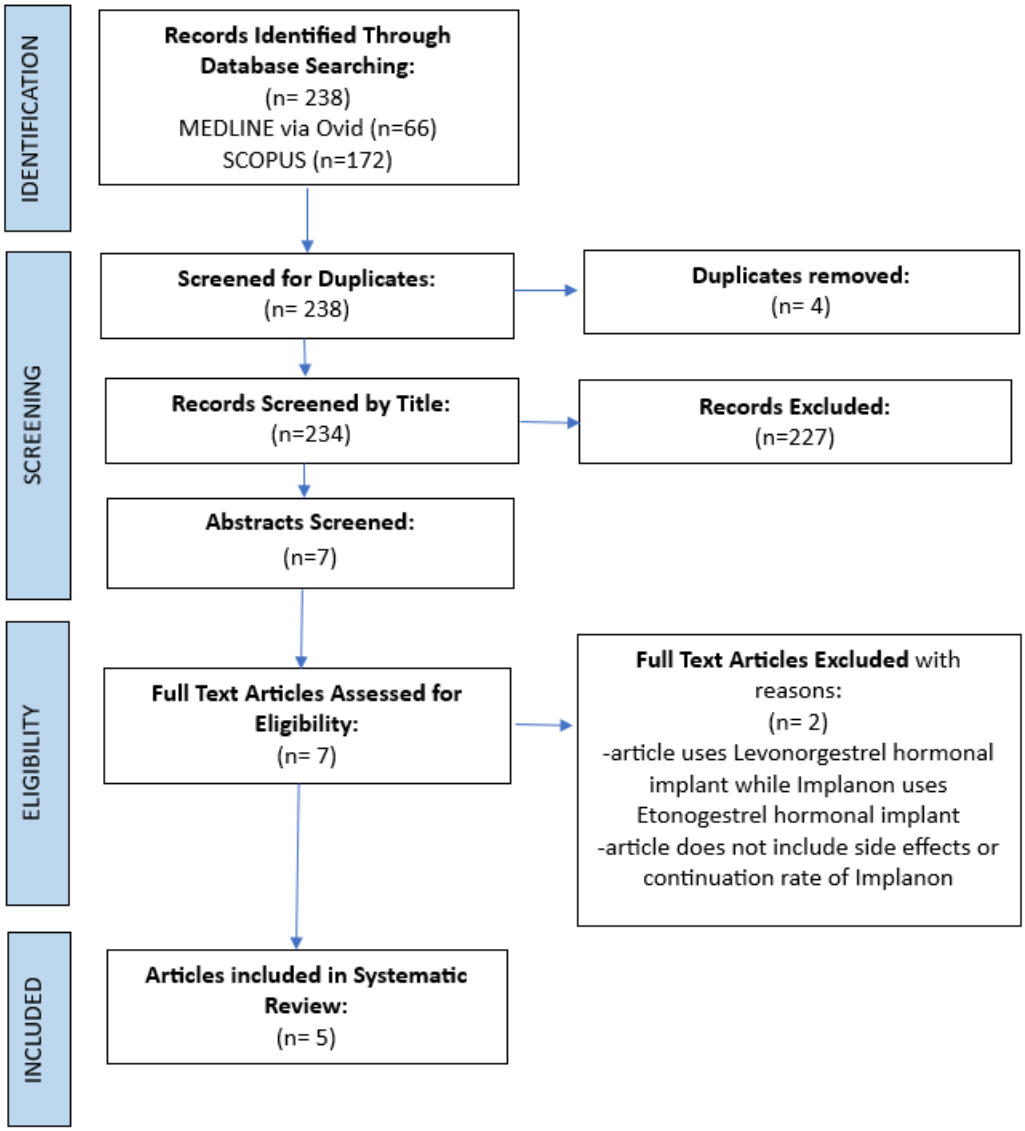

Fig. 1: Study selection procedure

The results retrieved from the databases were screened in three steps. 1) The titles of the articles were screened. From the initial database search of Medline via Ovid and SCOPUS, 238 articles were identified. Four duplicates were removed. The authors independently screened all the search results and excluded 227 articles with titles that did not fulfill inclusion criteria. 2) Abstracts for 7 articles were screened for eligibility. 3) Full text of the articles was read and assessed thoroughly to exclude articles that did not meet our inclusion criteria or fulfilled the exclusion criteria. All the authors were involved in the selection and the data extraction phase with at least 2 authors involved with each article. Any differences in opinions were resolved by discussion between the authors. Five articles (23-27) were included in the systematic review. The protocol of this review was not registered in the registries of systematic review protocols.

Data Extraction and Management

The following data were extracted from each article:

1. Sample population
2. Study design
3. Side effects of implanon
4. Continuation rates of implanon
5. Reasons for removal
6. Satisfaction rates.

The data was tabulated in Table 3 for easy comparison. Percentages were recalculated using the total number of participants to ensure accuracy.

Assessing the Risk of Bias of the Studies

Risk of bias of the included studies was assessed by the reviewers using ROBINS-I V2 Risk of Bias tool (22). This review focused on 7 domains of bias, which included bias due to confounding (items 1, 2 and 3), bias in classification of interventions (items 4 and 5), bias in selection of participants into the study (item 6), bias due to deviations from intended interventions (item 7), bias due to missing data (items 8, 9 and 10), bias in measurement of the outcome (items 11 and 12) and bias in selection of the reported result (items 13, 14, 15 and 16). Risk of bias graph for the studies selected is shown in Fig. 2. The judgements of low risk of bias (green), moderate risk of bias (yellow), serious risk of bias (red) and critical risk of bias (dark blue) were derived using specific algorithms for each domain and were reported to properly assess the risk of bias (22).

Results

Study Characteristics

The number of studies found is shown in Fig. 1. The features of the selected studies are shown in Table 3. There were two studies (23,24) which were prospective studies while three studies (25) (26,27) were cross-sectional studies. For the publication year, three studies (23-25) were published before 2019 when the COVID pandemic hit, while the other two studies (26,27) were published in 2023 and 2024 respectively. Based on location, two studies (23,24) were conducted in Turkey, two (26,27) were conducted in Saudi Arabia and one (25) was conducted in Jordan. Based on sample size observation, four studies (23-26) had sample sizes of less than 100 participants while one study (27) had a sample size of more than 100 participants.

For the methodology, two studies (23,24) evaluated the participants prior to implanon insertion, then monitored them at regular intervals post insertion. The other two studies (25,27) used telephone-based surveys to assess the participants while one study (26) used an online questionnaire.

The studies differed in their methods of measuring side effects. Participants from the two prospective studies (23,24) were asked to keep a menstrual diary and were also asked regarding side effects during regular follow-up. From the cross-sectional studies, two (26,27) adapted questionnaires from previous studies (28,29) while one study (25) used a survey method without mentioning the questionnaire used.

Two articles were excluded from the systematic review. The first one was excluded because it

dealt with the Levonorgestrel hormonal implant usually found in Norplant implants, whereas implanon implants use the Etonogestrel hormone (30). The second study was excluded because it did not include the side effects and continuation rate of implanon (31).

Table 3: Summary of the characteristics of the studies included in the present review

Study	Results			
	Side Effects	Continuation Rates	Reason for removal	Satisfaction
Yildizbas et al (2007) (23)	• Menstrual irregularities 38 (92.7%) • no statistically significant changes in blood pressure, BMI or frequency of headache • Weight gain: no significant change after 6 months • Acne 11 (26.8%) • Headache 16 (39%) • Mood changes 7 (17.1%) • Loss of libido N/A • Nausea 12 (29.3%) • Dizziness 19 (46.3%) • Mastalgia 5 (12.2%)	• 8 (19.5%) requested removal upon completing 6 months • 33 (80.5%) continued using Implanon after 6 months	• Irregular bleeding (n=6, 14.6%) • Weight gain (n=1, 2.4%) • Depressive symptoms requiring treatment (n=1, 2.4%)	N/A
Gezginc et al (2007) (24)	• Menstrual irregularities 74 (92.5%) • Weight gain N/A • Acne 8 (10%) • Headache 3 (3.75%) • Mood changes 2 (2.5%) • Loss of libido 2 (2.5%) • Breast tenderness 15 (18.75%) • Pelvic pain 2 (2.5%)	• 20 (25%) removed before 1 year • 60 (75%) used Implanon for at least 1 year	Reasons for removal were: • frequent/prolonged bleeding (n=7, 8.75%) • anxiety about migration of Implanon (n=5, 6.25%) • headache and dizziness (n=3, 3.75%) • depressive mood (n=2, 2.5%) • loss of libido (n=2, 2.5%) • planned pregnancy (n=1, 1.25%)	N/A
Moamar Al-Jefout et al (2015) (25)	• Menstrual irregularities 52 (75.3%) • Weight gain 27 (39%) • Acne 9 (13%) • Headache 26 (37.6%) • Mood changes 31 (44.9%) • Loss of libido 28 (40.5%) • Nausea and abdominal discomfort 14 (20.2%)	• 22 (31.9%) removed Implanon after 1 year • 35 (50.7%) removed Implanon after 2 years • 12 (17.4%) removed within 3rd year	32 women (46.4%) removed Implanon prematurely (<2 years) due to side effects • bleeding disturbances (n=17, 24.6%) • mood change (n=16, 23.1%) • reduced libido (n=13, 18.8%)	N/A

Table 3: Continued…

			• weight gain (n=11, 15.9%) • headache (n=11, 15.9%) • nausea (n=7, 10.1%) • acne (n=5, 7.2%) hirsutism (n=1, 1.45%)	
Wali et al (2023) (26)	• Menstrual irregularities 33 (39.3%) • Weight gain 46 (54.8%) • Acne N/A • Headache 31 (36.9%) • Mood changes N/A • Loss of libido 22 (26.19%) • Pain/numbness in the arm 4 (28.5%) • Dizziness 12 (14.29%)	• N/A	Reasons for removal of Implanon among participants (if they removed it or would like to remove it) • expired/completed 3 year duration (n=36, 42.86%) • weight gain (n=31, 36.9%) • want to conceive (n=29, 34.5%) • menstrual irregularities (n=24, 28.6%) • headaches (n=19, 22.6%) • loss of libido (n=13, 15.5%) • pain/numbness in the arm (n=13, 15.5%) • dizziness (n=12, 14.3%)	• Satisfied 65.48% (n=55) • Neutral 15.48% (n=13) • Unsatisfied 19.04% (n=16) • 57.14% (n= 48) said they would recommend it to a friend • 16.67% (n=16) said they would not recommend it to a friend.
Shams et al (2024) (27)	• Menstrual Irregularities 303 (88%) • Weight gain 42 (12%) • Acne 36 (10.4%) • Headache 59 (17%) • Mood changes 101 (30%) • Loss of libido N/A • Pain/numbness in the arm 64 (19%) • Change in bowel habit 28 (8%)	• Removed within first year of use 38 (11%) • Removed between first year and 3rd year 36 (10.4%) • 258/332 (78%) completed 3 years of use	Reasons for discontinuation were as follows: • Menstrual irregularity (n= 63/74, 85%) • Mood changes (n= 25/74, 33%) • Skin changes (n= 24/74, 32%) • Arm pain/numbness (n=24/74, 32%) • Headache (n=17/74,23%) • Desire to conceive (n=7/74, 9%) Personal or religious reasons (n=6/74, 8%)	N/A

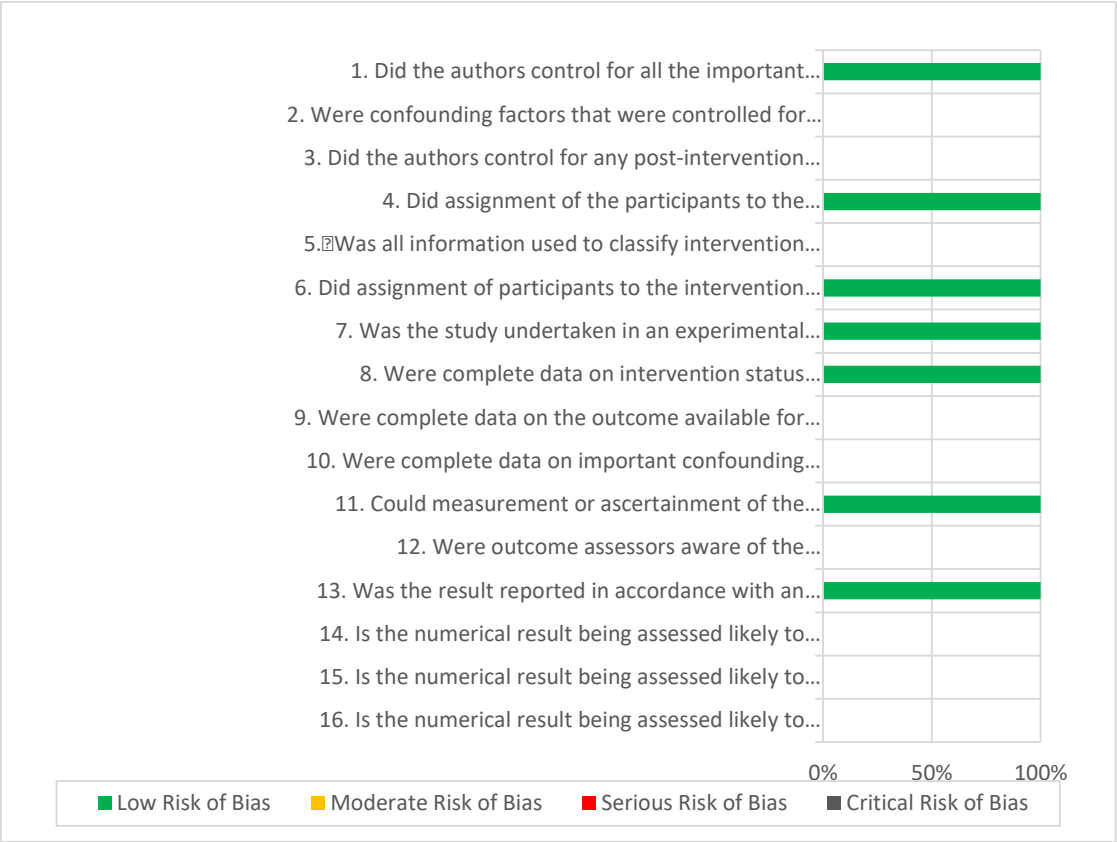

Fig. 2: Results of the risk of bias assessment of the five studies included in this systematic review. Seven domains of bias were utilized to assess study quality by scoring reporting. The checklist of items follows the ROBINS-I V2 assessment tool. Blanks left intentionally since a few items contribute to a single domain

Findings Based on Prevalence of Side Effects

The common side effects associated with implanon are menstrual irregularities, weight gain, mood changes and acne. The less common side effects are headache, breast tenderness, loss of libido and pain/numbness in the arm (Table 2). Four studies (23-25,27) had menstrual irregularities as the main side effect with a prevalence rate of 75.3% to 92.7% while one study (26) showed it as second most common with a rate of 39.3% after weight gain which was 54.8%. Three studies (25-27) showed weight gain in participants ranging from 12% to 54.8%. One study (23) showed no statistically significant changes in Body Mass Index (BMI) while one study (24) did not include weight gain. Four studies (23-25,27) showed an increase in mood changes ranging from 2.5% to 44.9%. For acne, four studies (23-25, 27) showed increase ranging from 10% to 26.8%. For headaches, all studies (23-27) showed increase in prevalence ranging from 3.75% to 39%. For breast tenderness, only two studies (23,24) studies measured it, ranging from 12.2% to 18.75%. For loss of libido, three studies (24-26) noted prevalence ranging from 2.5% to 40.5%. For pain/numbness in the arm, two studies (26,27) noted prevalence of 19% to 28.5%.

Findings Based on Continuation Rates

There were four studies (23-25,27) which monitored continuation rates while one study (26) did not. Continuation rates were monitored at different intervals by each study shown in Table 3. One study (23) used a 6-month interval, one study (24) used a 1-year interval, and two studies (25,27) used 1 year and 3-year intervals. From the study that used the six-month interval (23), 19.5% of participants requested removal upon

completing 6 months while 80.5% continued using Implanon after six months. In addition, two studies (24,27) noted the rate of discontinuation within the first year at 25% and 11% respectively. Al-Jefout et al, (25) noted 50.7% of participants removed implanon after the 2nd year while 17.4% removed it within the 3rd year. In comparison, Shams et al, (27) noted 10.4% of participants removed implanon between the 1st and 3rd year, while 78% of participants completed three years of implanon usage.

Findings Based on Reason for Removal

All five studies (23-27) assessed reasons for removal and they are shown in Table 2. There were four studies (23-25,27) which noted the most common reason for removal was menstrual irregularity or bleeding disturbance ranging from 8.5% to 85%. Weight gain was noted in three studies (23,25,26) as the reason for discontinuation with rates ranging from 2.4% to 36.9%. Depressive mood or mood change was noted in four studies (23-25,27) which caused 2.49% to 33% of participants to discontinue implanon. Planned pregnancy or desire to conceive was noted in three studies (24,26,27) with a rate of 1.25% to 34.5% among participants. Headache was also commonly noted among four studies (24-27) as the reason for removal of implanon ranging from 3.75% to 23% of participants. Loss of libido was noted in three studies (24-26) to cause early removal of implanon among participants with rates ranging from 2.5% to 18.8%. Acne or skin changes was noted in two studies (25,27) causing 7.2% to 32% of participants to discontinue implanon. Pain or numbness in the arm was noted in two studies (26,27) causing 15.5% to 32% of participants to have early removal of implanon. Personal or religious reasons was noted in one study (27) causing 8% of participants to discontinue implanon.

Findings Based on Satisfaction

Only one study (26) assessed satisfaction rates among users of implanon. Most users (65.48%) were satisfied, 19.04% were unsatisfied while 15.48% were neutral. 57.14% of users said they would recommend implanon to a friend while 16.67% said they would not.

Risk of Bias Assessment

The results for the risk of bias assessment of all included studies are listed in Fig. 2. For bias due to confounding (items 1, 2 and 3), all authors did not control for important confounding factors since all study participants received the implanon contraceptive implant as an intervention. For bias in classification of intervention (items 4 and 5), all participants were assigned to the intervention group (100%), which indicates a low risk of bias. All participants were assigned to the intervention group regardless of any events or measurements after the start of follow up (item 6), which shows a low risk of bias in selection of participants into the study. All studies were not undertaken in an experimental context (item 7), thereby having a low risk of bias due to deviations from intended interventions. Complete data on intervention status, outcome available and confounding variables (items 8, 9 and 10) were available for all participants in all studies, leading to low risk of bias due to missing data. All authors were aware of the intervention received by participants and had no difference in outcome measurement between intervention groups (items 11 and 12). This shows a low risk of bias in measurement of the outcome. All studies reported results in accordance with an available, pre-determined analysis plan (item 13). Lastly, the results of all studies were not likely to have been selected based on results, from multiple outcome measurements (item 14), multiple analysis of the data (item 15) or multiple subgroups (item 16). Therefore, there was low risk of bias in selection of the reported results. Overall, all studies included in this review have low risk of bias. Refer to the Supplementary Material for the risk of bias assessment tool.

Discussion

This review was systematically done to investigate the acceptability of implanon among users in majority-Muslim Asian countries. In one study, the

fear of side effects has moderate influence on contraceptive choice in 22.1% of respondents and highly influences the contraceptive choice of 35.7% of respondents (31).

The WHO through its Special Programme of Research, Development and Research Training in Human Reproduction outlined vaginal bleeding analysis according to 90-day reference periods, taking into account the number of bleeding episodes, bleeding-spotting episodes and bleed-free days. Menstrual irregularity includes amenorrhea, infrequent bleeding, frequent bleeding and prolonged bleeding (32). From studies in Asia (14), 70% of respondents reported irregular menses, 52.9% of participants faced irregular bleeding (9), frequent bleeding ranged between 1.3% and 10.4%(11). Side-effects related to bleeding included infrequent bleeding (28%), amenorrhea (33%), prolonged bleeding (15%), and metromenorrhagia (frequent and heavy bleeding) (16%)(15). The findings of our systematic review are consistent with previous studies in that menstrual irregularities are the most common side effect experienced by participants ranging from 39.3% to 92.7%. On average, 77.56% of participants experienced menstrual irregularities across all five studies.

Weight gain is also a significant side effect of implanon. Funk et al, (12) found weight increase in 3.3% of participants, while Mastor & Khaing, (14) noted weight gain in 8.6% to 23.6% of participants. Body weight tended to increase while on implanon (11). The mean change of body weight after years 1, 2, 3 and 4 were 0.82 kg, 1.15 kg, 2.50 kg and 3.10 kg respectively. Patanayindee et al, (10) noted 24% of subjects had BMI increased more than 10% from baseline, and mean BMI increased from 21.7 to 22.8 for those completing 4 years. From our systematic review, weight gain was noticed in 3 studies ranging from 12% to 54.76% of participants. However, Yildizbas et al, (23) noted no significant change in weight after 6 months in all participants. Weight gain is a significant cardiovascular risk factor (33). However, it can be mitigated by maintaining a balanced diet and healthy lifestyle (34).

Acne is a less common side effect of implanon, which impacts its overall acceptability. Our review noted participants experiencing acne ranged from 10% to 26.8%. The average rate of the acne side effect was 15.05% across four studies. Other side effects that were experienced by participants include headache, mood change, loss of libido, nausea, dizziness, mastalgia or breast tenderness, pain or numbness in the arm and change in bowel habit.

A study in Africa (29) showed a discontinuation rate of 34%, while a study in Australia (13) showed that 74% continued at 1 year, 61% continued at 1.5 years and 50% continued at 2 years. Our review noted two studies (25,27) which showed comparable continuation rates. The first study (25) noted 50.7% of participants removed implanon after the 2nd year while 17.4% removed it within the 3rd year. In the second study (27), it was noted 10.4% of participants removed implanon between the 1st and 3rd year, while 78% of participants completed 3 years of implanon usage.

Glasier, (35) found that menstrual disturbance is by far the most common reason for discontinuation. A study in Thailand (10) found bleeding problems caused 7% of subjects to discontinue implanon, while a study in the United States of America (12) had 13% of subjects discontinue due to bleeding irregularities. The results of our systematic review are consistent with other international studies in those four studies (23-25,27) noted the most common reason for removal was menstrual irregularity or bleeding disturbance ranging from 8.5% to 85%. Potential implanon user must be adequately counselled on its side effects, what to expect and ways in which to manage said side effects. Menstrual irregularities can be mitigated with the use of combined oral contraceptive pills (COCP), whereas weight gain can be mitigated by increased exercise and a balanced diet. Acne can be controlled with a healthy diet, good facial hygiene, and proper use of cosmetic products. In addition, the user must also be properly counselled on how menstruation can be harmonized with religious practice to reduce early discontinuation and increase acceptability. Medi-

cal practitioners must familiarize themselves with religious tenets regarding menstruation in order to provide better counselling and reassurance.
Our review noted that, in general, a majority of participants (65.48%) was satisfied, 19.04% were unsatisfied while 15.48% were neutral (26). The benefits of implanon, such as high efficacy and convenience of use, far outweigh potential side effects encountered and lead to high rates of satisfaction among users. We recommend further research such as longitudinal studies, in order to better our understanding of the long-term side effects of implanon.

Limitations

Our review is limited by the small number of studies. We acknowledge the differences in methodology between the studies. The tools used to measure side effects were also different since a menstrual diary has higher accuracy and less recall bias compared to a questionnaire or telephone survey. Different approaches were used in order to achieve the study objective. Studies with routine follow-up by clinicians are better at detecting new onset of side effects compared to cross-sectional studies. This might affect the interpretation of findings and the accuracy of results reported. A more accurate comparison of side effects would involve classifying the study participants according to their age since older women above age 35 with reduced ovarian reserves are expected to have menstrual irregularities.

Conclusion

Implanon's documented side effects such as menstrual irregularity and weight gain is tolerable due to its high efficacy. Implanon also has low discontinuation rates and the main reason for discontinuation is menstrual irregularity. Implanon users reported a high satisfaction and remains a viable contraceptive option among the Muslim population and majority-Muslim Asian countries.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflicts of Interest

The authors declare no conflicts of interest.

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