A SYSTEMATIC REVIEW AND META-ANALYSIS ON WOMEN'S KNOWLEDGE OF PRECONCEPTION CARE

Zemenu Yohannes Kassa, MSc[1], Nebiha Hadra, MSc[1]

ABSTRACT

BACKGROUND: Preconception care includes any intervention to optimise a woman's health before pregnancy to improve maternal, newborn, and child health outcomes. It is vital for identifying risky behaviours before pregnancy and reducing the number of unintended pregnancies. This meta-analysis aimed to determine the pooled prevalence of women's knowledge across the world.

METHOD: Published and unpublished research reports on women's knowledge of preconception care were used. The databases used are PubMed, Medline, and Google Scholar. Unpublished articles were searched from different repository electronic libraries and through Google. Two independent authors (ZY and NH) searched articles by using the following key terms, "knowledge" OR "awareness", "woman/women*" AND "preconception care", "preconception care" OR "preconception health care", "preconception care" AND "worldwide". The critical appraisal was done using the Joana Brigg's Institute (JBI) checklist for prevalence study, which has nine scores.

RESULTS: Four hundred twenty-eight published and unpublished articles were retrieved from different databases: PubMed, Medline, Google Scholar, Google, and Cochrane Library. Unpublished articles were searched from different repositories, electronic libraries, and Google. The pooled prevalence of women's preconception care knowledge was 35.3% (95% CI: 24.5-47.8%).

CONCLUSION: This study showed that women's knowledge of preconception care is low. This finding suggests that governmental and non-governmental organisations should pay attention to creating awareness and implementation to enhance preconception care.

KEY WORDS: Women's knowledge, Preconception care, Meta-analysis, World

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1 Department of Midwifery, College of Medicine and Health Sciences, Hawassa University, Hawassa

INTRODUCTION

Preconception health care improves maternal and unborn child outcomes by recognising and identifying risky behaviours before pregnancy and reducing the number of unintended pregnancies [1]. It is crucial to prevent maternal and child morbidity and mortality, which is mainstreamed in the routine health care system [2]. Preconception care (PCC) is defined as the provision of biomedical, behavioural, and social health interventions to women and couples before conception. It aims to improve their health status and reduce behaviours and individual and environmental factors that contribute to depriving maternal and child health outcomes [3].

Despite the international community's priority agenda on maternal and child health care, maternal and neonatal mortality reduction is not at the expected level [4]. Preconception care plays a crucial role in maternal and neonatal morbidity and deaths. It is evidence-based health promotion, disease prevention, and treating existing disease before pregnancy to prevent adverse pregnancy outcomes. However, it is not routinely practised within the continuum of maternal and child health care in low and middle-income countries. Maternal and child health experts recommend that preconception health care is a crucial intervention to modify biomedical, behavioural, and social risks for better pregnancy and childbirth outcomes through risk assessment, health promotion, disease prevention, and care provision [5,7].

Preconception of health care is an old idea, but little attention has given to maternal stakeholders and experts [8, 9]. At the same time, developing countries are not integrated with the continuum of care on maternal and child health care. It provides a window of opportunity to eliminate risks by focusing on the period before conception [10, 11].

Currently, care is focused on antenatal care, institutional delivery, postnatal care, and child health to reduce maternal and neonatal morbidity and mortality [12]. However, as one of the key elements to tackle maternal and neonatal morbidity and mortality, preconception care is missing in the package [12]. Every day, 7000 neonates died globally in 2018, and 2.5 million neonates died in the first month of life. Neonatal mortality was estimated at 18 deaths per 1000 live births worldwide [13]. Worldwide every year, 295 000 newborns die within 28 days of birth due to congenital anomalies [14]. Besides, couples' knowledge of preconception care is crucial to improving maternal and child health [15, 16]. Preconception healthcare guidelines have developed and integrated as a continuum of care in high and middle high countries, while most low-income countries have not yet set guideline [17]. Knowledge of preconception care can be acquired through experience or education. Education can be attained from multiple sources (e.g., books, newspapers, radio channels, television, the internet or medical staff consultations, friends, and families). Studies have revealed that women who receive prepregnancy care have more knowledge and often show more significant risk reduction behaviours [18]. There is disperse studies that did not show the pooled prevalence of women's knowledge of preconceptions. Therefore, this systematic review and meta-analysis of women's preconception care knowledge are crucial to fill the gap. This study is used as an input for policymakers, relevant stakeholders, and clinicians to reduce the global maternal mortality ratio to less than 70 per 100,000 live births, to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.

METHODS

Published and unpublished research reports on women's knowledge of preconception care were used. The databases used are PubMed, Medline, and Google Scholar. Unpublished articles were searched from different repositories from electronic libraries and Google. Searching for the articles was conducted from September 10 to December 12, 2018. Two independent authors (ZY and NH) searched articles by using the following key terms, "knowledge" OR "awareness", "woman/women

AND "preconception care", "preconception care" OR "preconception health care", "preconception care" AND "worldwide"

Inclusion

In this study, journal articles, masters' theses, and dissertations are included. Study settings included are community-based or institutional-based crosssectional studies which report the level of women's knowledge of preconception care.

Exclusion

Conference abstracts, proceeding abstracts, articles with incomplete information, have methodological problems, full text not available, systematic review, and meta-analysis and articles not publish in the English language are excluded. All records were managed in Endnote version X7 to remove duplicated studies.

Data screening and extraction

Data screening and extraction were done by two independent authors (ZY and NH) using Preferred Reporting Items for Systematic reviews and MetaAnalyses (PRISMA) guidelines [19].

The critical appraisal was done using the Joana Brigg's Institute (JBI) checklist for prevalence study by two independent assessors (ZY and NH) [20] using nine checklist items. Nine checklist items are the sample frame appropriate to address the target population; study participants sampled appropriately, the sample size adequate, the study subjects and the setting described in detail, the data analysis conducted with sufficient coverage of the identified sample, valid methods used for the identification of the condition, the condition measured in a standard, reliable way for all participants, appropriate statistical analysis and the response rate adequate, and if not, was the low response rate managed appropriately. Scoring problems during the critical appraisal were solved through discussion and consensus reviewing the articles together. During the critical appraisal articles score, ≥five are included in this systematic review and meta-analysis.

Statistical analysis

Data entry was done using Microsoft Excel and exported to a comprehensive meta-analysis (version 3.1) for analysis. The pooled prevalence of women's knowledge on preconception care with 95% CI was done using the random effect model, due to the possibility of heterogeneity among the studies.

Heterogeneity and publication bias

Heterogeneity was assessed using I2 and Cochran's Q test (P-value >0.10). I2 test statistics results of 25%, 50%, and 75% were declared as low, moderate, and high heterogeneity respectively [21]. The publication bias was assessed using Egger's test objectively and funnel plot subjectively. Any asymmetry of a funnel plot and statistically significant p-value less than 0.05 was suggestive of publication bias [22].

RESULTS

Four hundred twenty-eight published and unpublished articles were retrieved from different databases: PubMed, Medline, and Google Scholar. Unpublished articles searched from different repositories from electronic libraries and Google. Articles were screened and extracted using the PRISMA guideline. Three hundred eighty articles were excluded due to duplication, 48 articles were reviewing full articles, and 34 articles were excluded after full article review due to unreported prevalence. Finally, 14 studies were included in the meta-analysis (Figure 1). The heterogeneity test revealed that I2=98.53 %, the p-value is 0.000, and publication bias (Egger's test p-value is 0.18).
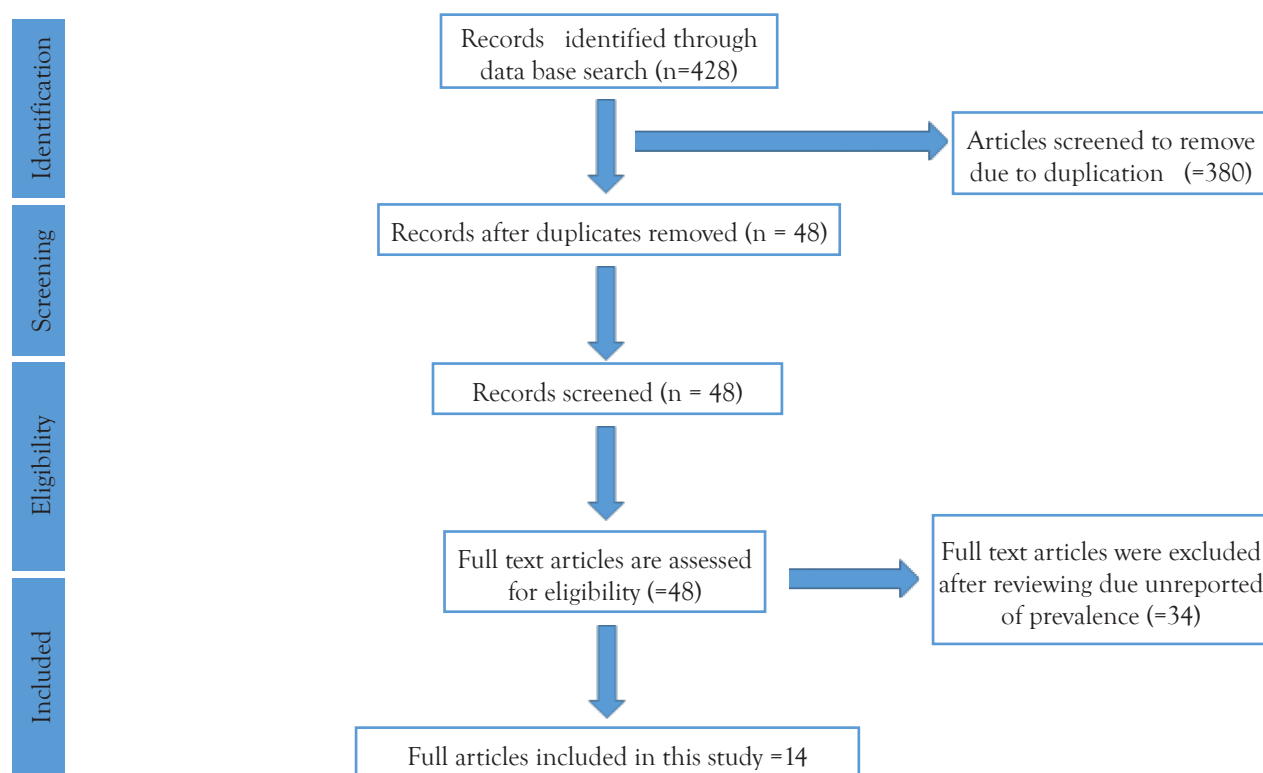
Figure 1: PRISMA Flow diagram

Study characteristics

The total study population that participated in this systematic review and meta-analysis was 5,208. Four hundred twenty-two participated in community based studies, 3802 have participated in hospitals based studies, and 984 were health institutionbased studies. The sample size varied from 100 to 660 (table 1) [23-36].

Table 1: women's knowledge on preconception care (23-36)

Author	Year of publication	Country	Study design	Study population	Sample size	No.know-ledgeable	Response rate	Prev.(%)
Ayalew et al.(23)	2017	Ethiopia	CS	Community	422	116	100	27.5
Kassa and Yohannes (24)	2018	Ethiopia	CS	Hospital	580	116	100	20
Andualem et al.,(25)	2016 UP	Ethiopia	CS	health	634	402	100	63.4
Zemenu et al.,(26)	2017 UP	Ethiopia	CS	Hospital	270	143	99	53
Ahmed K et al(27)	2015	Sudan	CS	Hospital	100	11		11
P. Paudel et al.(28)	2012	Nepal	CS	Hospital	400	65	100	16.3
Prashansa Gautam et al.;(29)	2016	Nepal	CS	Hospital	227	35	100	84.58
Moura et al(30)	2012	Brazil	CS	Hospital	106	44	100	41.5
Coonrod (31)	2009	USA	CS	Hospital	305	232	100	76
Gjergja et al.(32)	2006	Croatia	CS	Hospital	569	408		71.7
N. N. EKEM et al(33)	2018	Nigeria	CS	Hospital	450	143	99.3	31.7
Al-Darzi et al(34)	2014	Egypt	CS	Hospital	660	259	98.2	39.2
Kasim et al(35)	2016	Malaysia		Hospital	135	70	100	51.9
Ghaffari et al.(36)	2014	Iran	CS	health	350	36		10.4

Meta-analysis

The pooled prevalence of women's preconception care knowledge was 35.3% (95% CI: 24.5-47.8%). The Cochran's Q and I2 statistics for women's knowledge of preconception care were 884.61 and 98.53% (fig .2).

Model	Study name	Statistics for each study			Events/Tot	Event rate and 95% CI					Weight (Random)
		Event rate	Lower limit	Upper limit	Total	-1.00	-0.50	0.00	0.50	1.00	Relative weight
	Ayalew et al.,(23)	0.275	0.234	0.320	116 / 422						7.23
	Kassa and Yohannes,(24)	0.200	0.169	0.235	116 / 580						7.24
	Andualem et al.,(25)	0.634	0.596	0.671	402 / 634						7.27
	Zemenu et al.,(26)	0.530	0.470	0.589	143 / 270						7.21
	Khalid et al.,(27)	0.110	0.062	0.188	11 / 100						6.62
	Paudel et al.,(28)	0.163	0.130	0.202	65 / 400						7.18
	Prashansa et al.,(29)	0.154	0.113	0.207	35 / 227						7.07
	Escolástica,(30)	0.415	0.325	0.511	44 / 106						7.04
	Coonrod,(31)	0.760	0.709	0.805	232 / 305						7.19
	R. Gjergja et al,(32)	0.717	0.679	0.753	408 / 569						7.25
	EKEM et al.,(33)	0.317	0.276	0.361	143 / 450						7.24
	W. Al-Darzi et al.,(34)	0.392	0.355	0.430	259 / 660						7.27
	Rosnani et al.,(35)	0.519	0.435	0.602	70 / 135						7.10
	Ghaffari et al.,(36)	0.104	0.076	0.141	36 / 350						7.09
Fixed		0.418	0.403	0.434							
Random		0.353	0.245	0.478							

Figure 2: Women's level of knowledge on preconception care

DISCUSSION

Preconception care implementation and provision is a window of opportunity to alter or eliminate risky behaviours by focusing on the period before conception. It is a cheap, simple strategy that can significantly decrease adverse pregnancy outcomes [10, 11, 37]. The purpose of this meta-analysis was to assess women's knowledge of preconception care. Fourteen studies were included in this metaanalysis. The pooled estimated prevalence of women's level of knowledge on preconception care was 35.3%. This finding showed that women's level of knowledge of preconception care is low compared to the idea of preconception care launched in 1960, whereas preconception care has not given attention until 2005 [8]. Women's knowledge of preconception care is quite different from country

to country; some countries have preconception care guidelines and routinely practice preconception care while others do not have a guideline. Women's level of knowledge on preconception care is vital for the alleviation of adverse pregnancy outcomes and to decrease maternal and child morbidity and mortality [38, 39]. Women who have adequate knowledge of preconception care can check their health status before conception to cease risky behaviours'. A meta-analysis showed that preconception care is effective to reduce congenital malformation [40]. The implication of this study is to synthesise information on women's level of knowledge on preconce ption care.

This meta-analysis is an input for relevant stakeholders and policymakers to achieve sustainable development goal 3.1 to reduce maternal mortality

ratio to less than 70 per 100,000 live birth by 2030 and 3.2 to reduce neonatal mortality to at least as low as 12per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births by 2030.

CONCLUSION AND RECOMMENDATION

This study revealed that women's knowledge of preconception care is low. This finding suggests that governmental and non-governmental organisations should give attention to the creation of awareness and implementation to enhance preconception care.

LIMITATION

The potential limitation of this study is method difference to measure knowledge on preconception care within the studies and the use of various scales. This can affect the level of knowledge of preconception care. Another limitation is the way of defining women's knowledge of preconception care differently and the use of different variables. An important limitation is most of the studies were institutional based, which misses the community-based study.

AUTHORS' CONTRIBUTIONS

ZY generated the idea and design for the study, collected, entered, analysed, interpreted the data, and prepared the manuscript. NH contributed to data analysis, interpretation and drafted the manuscript. All authors read and approved the final manuscript.

DISCLOSURE STATEMENT

The authors declare there are no competing interests.

ETHICS AND CONSENT

Not applicable

PAPER CONTEXT

We carried out a systematic review and meta-analysis of women's level of knowledge on preconception care in the world to synthesis pooled level of knowledge on preconception care by women. Women's level of knowledge on preconception is 35.3%. Meanwhile, maternal health and child health priority agendas are still a significant number of maternal and neonatal morbidity and mortality. This evidence recommended that stakeholders create awareness on preconception care and implement preconception care strategy to improve women's knowledge of preconception care..

CORRESPONDING AUTHOR

Zemenu Yohannes Kassa, MSc
Department of midwifery, college of medicine and health sciences, Hawassa University, Hawassa
Email: zemenu2013@gmail.com

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