Prevalence of depression among women with obstetric fistula: A systematic review and meta-analysis Berhanu Boru Bifftu [BBB] 1*and Yonas Deressa Guracho [YDG]2

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Research article

Keywords: Co-morbidity, Depression, Obstetric Fistula

Posted Date: March 18th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-17602/v1

Abstract

Objective Obstetric fistula is one of the most devastating birth injuries, affecting up to 3.5 million women. Depression is the priority mental disorders affecting up to 98% the patient living with obstetric fistula and adversely affects their quality of life. Inconsistent reported prevalence of depression and dearth of comprehensive meta-analysis need an up to date evidence for decision makers. Thus, the purpose of this meta-analysis was to determine the pooled prevalence of depression among women with obstetric fistula.

Methods Databases including PubMed, Cochrane Library and SCOPUS were searched. Heterogeneity across the studies was assessed by Cochrane chi-square ($\chi 2$) and quantified by I 2 statistics test. Funnel plots and Egger's test were used to determine publication bias. Sensitivity test and subgroup analysis were also performed. The pooled prevalence of depression was calculated using random effects model and Dersimonian and Laird method.

Results Fifteen eligible studies were included in the study. The pooled prevalence of depression was found to be 72% (95% CI; 60%-83%). We found evidence of significant heterogeneity (I 2 =95.64% and $p < 0.001$). Sensitivity test showed none of the point estimates was outside of the overall 95%CI. No evidence of publication bias egger's test ($p = 0.654$).

Conclusion Around three fourth of women with obstetric fistula experienced depression. Thus, authors' suggest the need of special attention to mange co-morbid depression among women with obstetric fistula, such as an integrated mental health care.

Background

Obstetric fistula is an abnormal opening between bladder and the vagina or between rectum and the vagina which causes urinary or faecal or both (urinary and faecal) incontinence (1–3). Poverty, early marriage, childbirth and lack of access to obstetric service are the contributing factors for the developments of obstetric fistula (4–7). Global, the prevalence of obstetric fistula ranged from 1 to 3.5 million (3, 8–11).

The consequence of untreated obstetric fistula, include but not limited to vaginal wetness, infections, bad odour, skeletal and cervical injuries, amenorrhoea, vaginal scarring and stenosis, infertility and fetal death (1–3, 12–16) affect the overall woman's quality of life (14, 17–21). This constant leakage of urine, faeces, or both also affects the psycho-social quality of women's lives. Of these, depression is one of the most common disorders affecting up to 98% of individual with obstetric fistula (12, 14, 17–20, 22–35). Depression is the priority mental disorders, which carry public health burden (26, 36), particularly for those of high risk group like women with obstetric fistula (19, 20, 28, 29, 37, 38), where majority of them were suffering with poor socio-economic status, unemployment and traumatic life events (14, 27, 39, 40) divorced marital status, and lack of social support (12, 28, 37), the incidence and persistence of depression is high with an estimated prevalence ranging from 25–98% (14, 18, 28–30, 37, 38, 41–43). This co-morbidity of depression had a wide range of adverse effect on the healing process of the wound,

incidence of other physical illness, substance use, treatment and suicide (22–27, 44, 45). In the context of these discrepancies in the reported individual studies, there is a need of a comprehensive quantitative meta-analysis. The objective of this meta-analysis was to determine the pooled prevalence of depression among women with obstetric fistula.

Methods

This systematic review and meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA)(46) guideline

Search strategy

A compressive search of electronic databases PubMed/Medline, Cochrane Library and SCOPUS (Elsevier) were conducted without time, country and language restrictions. Keywords were used to search PubMed/Medline, Cochrane Library and SCOPUS. Additional Medical Subject Headings (MeSH) terms were formulated for use in PubMed. Combinations of MeSH thesaurus and text words combining with appropriate Boolean operators were used. Index terms were utilized in to SCOPUS (EV ensure that all relevant articles were retrieved. Reference lists of all articles were also searched. Moreover, a grey literature search for additional unpublished sources was conducted at Google scholar. All searches were performed until June, 01, 2019. PubMed/MEDLINE database was searched using the following search terms and search strategy: ((depressive disorders [MeSH Terms]) OR (depressive disorders) OR (depressive symptoms [MeSH Terms]) OR (depressive symptoms) AND ((associated factors [MeSHTerms]) OR (associated factors) OR (determinant factors [MeSH Terms]) OR (determinant factors) AND ((vesico-vaginal fistula [MeSH Terms]) OR (vesico-vaginal fistula) OR (obstetric fistula [MeSH Terms]) OR (obstetric fistula) OR (recto-vaginal fistula [MeSH Terms]) OR (recto-vaginal fistula) OR (urogenital fistula [MeSH Terms]) OR (urogenital fistula)).

Selection of studies

All articles retrieved through search strategy were imported to EndNote X7 (Thomson Reuters, New York, USA). After excluding the duplicated studies from EndNote Library, the title and abstracts of the remaining articles were assessed independently by two reviewers (BBB and YDG) and disagreements were resolved by discussion. Conference abstracts, letters to editors, review, and commentary articles were excluded.

Eligibility criteria

Participants

This review targets women with obstetric fistula.

Outcome measure

This review included studies that investigated the prevalence of depression using standardized assessment tool.

Study design

Observational studies (cross-sectional and cohort/longitudinal) were included in this systematic review and meta-analysis. For follow up studies, we included the base line results. Studies that focused on case reports, conference and abstract were excluded.

Quality assessment

The methodological quality of included studies was assessed by two independent reviewers (BBB and YDG) using the Joanna Briggs Institute Meta-analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) critical appraisal tool for prevalence studies (47). This JBI quality assessment tool has response option of “yes”, “no”, “unclear” and “not applicable”. The overall quality of the study was determined based on the overall mean and define as “high risk” for score ≥ mean and “low risk” for score < mean. Disagreements were solved by discussion.

Data extraction

Data were extracted from the eligible studies by two independent reviewers (BBB and YDG) using a pre-conceived data abstraction form and any disagreements were resolved by discussion. We extracted the following data items from each articles: name of the first author, year of publication, study area/region, study design, study population, data collection tool, sample size and number of cases/prevalence of depression.

Data analysis

The extracted data were entered into a Micro-soft Excel Database and then exported into Stata 14 that we installed packages for meta-analyses online. Pooled prevalence of depression was calculated using metaprop command with a random-effects model (48) using the Dersimonian and Laird method based on the transformed values and their variance (49). We fit the Freeman–Tuckey variant of the arcsine square root transformation of proportions to avoid variance instability when handling proportions close to one (50). The score test-based confidence interval was used for the proportions of depression. Test for Heterogeneity was performed using Cochran’s Q statistic and the I^2 statistics. I^2 value greater than 50% was considered as indicative of substantial heterogeneity (51). Sub-group analysis was performed by sample size and study quality, year of publication, assessment tool and country. Evidence of publication bias was tested using visual inspection of the symmetry in funnel plot (52) and Egger’s tests (53). A sensitivity analysis was conducted to examine influential study.

Results

The initial database literature search resulted in 296 published articles. Additional, 28 studies were located through other source. Finally, the overall literature search resulted in 324 articles. Of these articles, 152 were excluded during the initial assessments as their title was found to be irrelevant. Of the remaining 172 studies, 91 were excluded through abstract reading because of different outcome. Finally,

66 papers were excluded because of different methods and unclear reports. Thus, the remained 15 studies were included in the systematic review and meta-analysis (Fig. 1).

Study characteristics

A total of 15 studies, including data from 1275 participants, were included in this systematic review and meta-analysis. The included studies were obtained from six different countries: Ethiopia (n = 5), Tanzania (n = 5), Sudan (2), Kenya (n = 1), Uganda (n = 2) and Nigeria (n = 1). All studies utilized institution based cross-sectional study design. Depression was assessed using four different assessment tool such as: GHQ-28 (n = 3), BDI-21(n = 3), CES-D (n = 4), HSC (n = 1) and PHQ-9 (n = 4) (Table 1). The overall quality score of included studies ranged from 5 to 8 (overall average 6.5). Of these, seven studies had low risk of bias and the remaining eight studies had high risk of bias (Table: 1).

Table 1
Characteristics of the studies

Author, Year	Country	Design	Outcome	Tool	Sample size	No. of cases	prevalence	Quality
Zeleke ,2013	Ethiopia	CS	Depression	BDI-21	37	36	97	High risk
Tewolde, 2015	Ethiopia	CS	Depression	BDI-21	40	39	98	Low risk
Belayihun, 2018	Ethiopia	CS	Depression	BDI-21	219	127	58	Low risk
Nweke ,2017	Nigeria	CS	Depression	GHQ-28	100	37	73	Low risk
Djengbed, 2014	Sudan	CS	Depression	CES-D	60	43	37	High risk
Weston ,2011	Kenya	CS	Depression	PHQ-9	70	51	72	High risk
Saadalla ,2016	Sudan	CS	Depression	GHQ-28	100	41	41	High risk
Watt ,2017	Tanzania	CS	Depression	CES-D	60	40	87	High risk
Wilson, 2015	Tanzania	CS	Depression	CES-D	54	14	67	High risk
Wilson, 2016	Tanzania	CS	Depression	CES-D	28	8	39	High risk
Dennis, 2016	Tanzania	CS	Depression	CES-D	59	23	74	Low risk
Tsegaw, 2018	Ethiopia	CS	Depression	PHQ-9	167	124	91	Low risk
Belayihun, 2019	Ethiopia	CS	Depression	PHQ-9	200	182	28	Low risk
Ayadi, 2019	Uganda	CS	Depression	HSC	60	36	6	Low risk
Krause, 2015	Uganda	CS	Depression	GHQ-28	21	20	95	Low risk

Table 2
Subgroup analysis by sample size, study quality and publication year

Subgroup	Number of Studies	Pooled prevalence	95% CI	I^2	P-value
Sample size					
Small (< median)	6	0.79	0.51–0.97	95.4	< 0.001
Large (≥ median)	9	0.67	0.54–0.80	96.99	< 0.001
Study quality					
Low risk	8	0.66	0.44-85	93.6	< 0.001
High risk	7	0.89	0.77–0.98	95.1	< 0.001
Publication year					
2011–2016	9	0.73	0.54–0.89	92.26	< 0.001
2017–2019	6	0.70	0.53–0.85	95.1	< 0.001
Tool					
BDI-21	3	0.84	0.36–100	-	-
PHQ-9	4	0.75	0.58–0.89	97.01	< 0.001
GHQ-28	3	0.69	0.34–0.95	-	-
CES-D	4	0.57	0.30–0.81	86.97	< 0.001
HSC	1	0.85	0.74-.092	-	-
Country					
Ethiopia	5	0.86	0.69–0.97	95.04	< 0.001
Kenya	1	0.73	0.61–0.82	-	-
Nigeria	1	0.37	0.28–0.47	95.84	< 0.001
Sudan	2	0.53	0.45-60	-	-
Tanzania	4	0.57	0.30–0.81	96.01	< 0.001
Uganda	2	0.88	0.80–0.95	-	-

Prevalence of depression

The overall pooled prevalence of depression was found to be 72% (95% CI; 60%-83%) (Fig. 2). We found evidence of significant heterogeneity (I^2 = 94.83% and p < 0.001).

Subgroup analysis

Subgroup analysis demonstrated higher pooled prevalence among studies with smaller sample size (pooled prevalence = 79% (95% CI: 51%-97%)) and publication year between 2011–2016 (pooled prevalence = 73% (95% CI: 54%-89%)) as compared to studies with higher sample size (pooled prevalence = 67% (54%-80%)) and publication year between 2017–2019 (pooled prevalence = 70% (95% CI: 53%-85%)) respectively (Table: 2).

Publication bias and sensitivity test

There was no evidence of publication bias from the visual inspection of the funnel plot (Fig. 3) and Egger's test (P < 0.654)]. The sensitivity analysis showed that none of the point estimates was outside of the overall 95% confidence interval confirming that there was no influential study. Thus, the pooled estimates based on the 15 studies could be important.

Discussion

In this systematic review and meta-analysis, majority [72% (95% CI; 60%-83%)] of women with obstetric fistula experienced depression. This result is five times higher than the pooled prevalence of depression among the general population 14.4% (95% CI: 11.1–11.7%) (23, 27, 54). This may be due to the severity of the illness and its negative life events. Previous studies showed that negative life events, such as relationship dissolution, illness, and death, were adversely affecting the mental health of individual (12, 28, 37). This adverse effect has a dose–effect relationship between the numbers of stressful life events and mental illness. The negative life events of women with obstetric fistula is unbearable, where more than 85% of them experience fetal loss, 27%-69.2% divorced, up to 53% social exclusion and majority lack social support and depend on families (23, 27). These affect the fulfillments of the role of women with obstetrics fistula as a partner, wife, mother, and productive member of community and impair social relationships, which in turn, them at increased risk for mental illness such as depression (12, 28, 37, 55–57). Evidence from previous meta-synthesis support the statistical finding of this meta-analysis and provided an evidence on the negative lived experience of women particularly change, in their marital status, role function, relationship, isolation, and economic deprivation. That is why the co-morbidity of psychosocial problem such as depression, anxiety, suicide and stigma were reported as not surprising (55–58). From these meta-synthesis, it is also reported that women with obstetric fistula have also number of negative psycho-social problems on religious practices, feelings of shame, hopelessness, depression, post-traumatic stress, decreased self-esteem, suicidal ideation and psycho-somatic symptoms (55–57). This systematic review and meta-analysis implied that (i) the prevalence of depression among women with obstetric fistula was high, (ii) the need of screening for all women with obstetric fistula and (iii) the needs of managing co-morbid depression or integrated mental health care.

Strengths and limitations of the study

To our knowledge, this is the first systematic review and meta-analysis on the mental health of women with obstetrics fistula. Moreover, the inclusions' of all studies without the restrictions of country, year of publication and use of standardized tools are the strength of this study. In addition to this, we conducted subgroup analysis and sensitivity test to account for possible sources of heterogeneity across the studies. However, some limitations like exclusions of studies assessed with un described assessment tool may minimize the number of included studies. Use of reference lists and Google Scholar to include all the available studies may have possibility of having some overlooked articles. Lack of similar studies limits the discussion.

Conclusion

The pooled estimate prevalence of depression among women with obstetric fistula was high. Thus, authors' suggest the need of special attention to mange co-morbid depression among women with obstetric fistula, such as an integrated mental health care.

Abbreviations

BDI-21
Beck Depression Inventory, CS:Cross-Sectional, CES-D:Center for Epidemiological Studies Depression Scale, CI:Confidence Interval, CIDI:Composite International Diagnostic Interview, CRD:Centre for Reviews and Dissemination, DSH:Deliberate Self-Harm, DSM-IV:Diagnostic and Statistical Manual of Mental Disorders 4th edition, EJHD:Ethiopian Journal of Health Development, EJHS:Ethiopian Journal of Health Science, EMBASE:ExcerptaMedica database, HSC:Hopkins Symptom Checklist, PHQ-9:Patient Health Questionnaire-9, I^2:Index of heterogeneity, ICD-10:Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems, MEDLINE:Medical Literature Analysis and Retrieval System Online, MeSH:Medical Subject Headings, NSSI:non-suicidal self-injury, OR:Odd Ratio, PRISMA:Preferred Reporting Items for Systematic Review and Meta-Analysis, PROSPERO:International Prospective Register of Systematic Reviews, WHO:World Health Organization, SBQ-R:Suicidal Behaviour Questionnaire-Revised and, BSS:Beck-Suicide Scale.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent to publish

Not applicable

Availability of data and material

All the available data were included.

Competing interests

None declared

Funding

This research received no grant from any funding agency.

Authors' contributions

BBB designed the systematic review and meta-analysis in collaboration with YDG. BBB developed the search strategy and drafted the protocol. YDG improved the drafted systematic review and meta-analysis. BBB and YDG provided their expertise to the section of suicidal behaviours and methodological section. BBB and YDG performed search strategy and conducted data selection and extraction. All authors were involved in data analysis and interpretation of the results and write up the manuscript. All authors have read and approved the final manuscript.

Acknowledgements

Authors' gratitude goes to University of Gondar for office arrangement and motivational support

to conduct this systematic review and meta-analysis.

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Figures

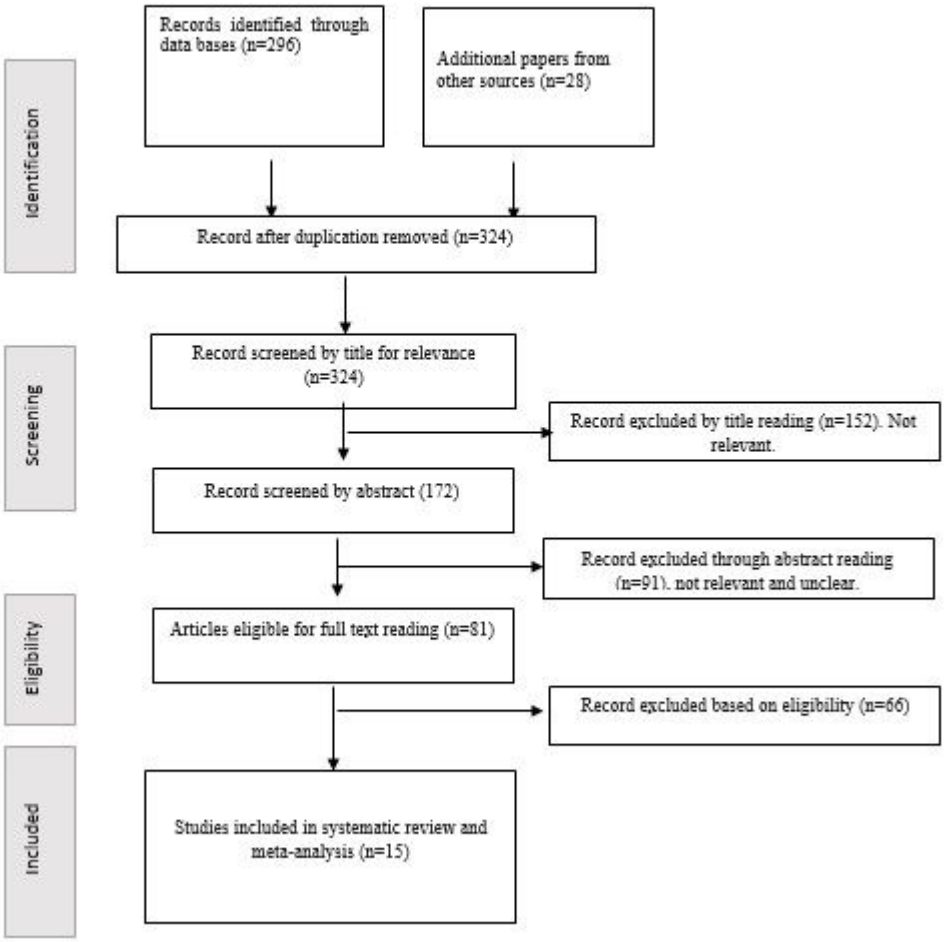

Figure 1

Flow diagram of included studies

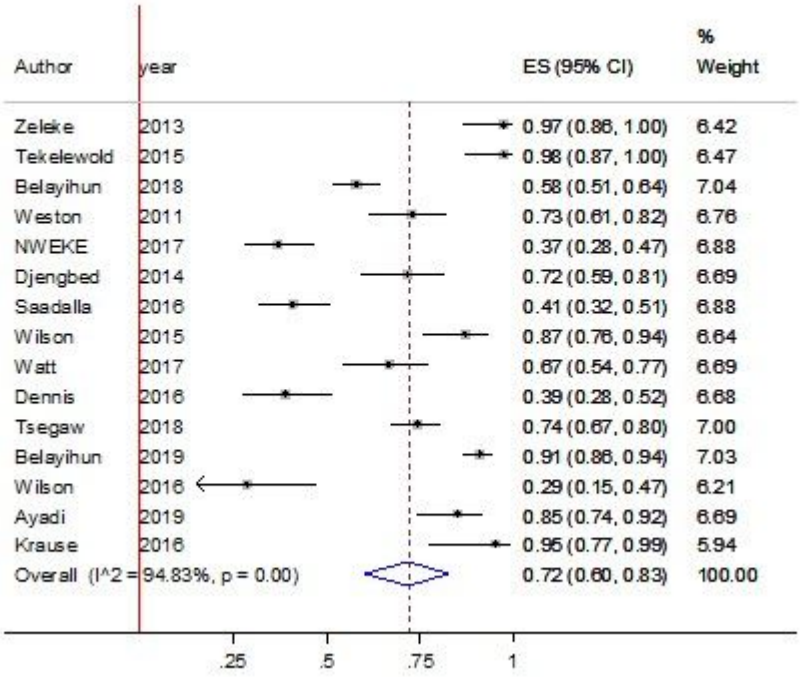

Figure 2

Forest plot presenting prevalence of depression using random effect models with 95% CI.

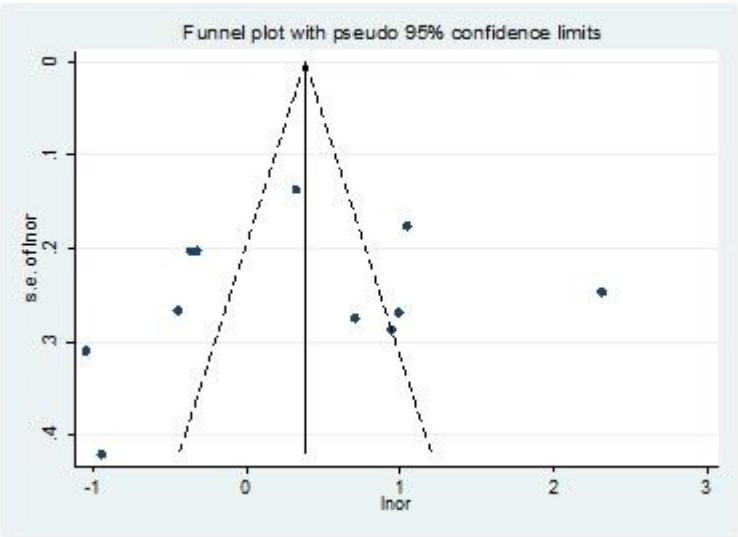

Figure 3

Funnel plot with pseudo 95 % confidence interval that investigated the heterogeneity of the pooled prevalence of depression.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- TableS1supportinginformation.docx