ORIGINAL RESEARCH ARTICLE

Magnitude and determinants of common mental disorders following abortion among women of reproductive age recruited from health institutions in Addis Ababa, Ethiopia: A cross-sectional study

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Abstract

The prevalence of common mental disorders (CMDs) among women who have had abortions is not well understood. The scope of this paper concerns the onset of CMDs after an abortion, with a focus on sub-Saharan Africa, particularly Ethiopia, where knowledge on the incidence of CMDs after an abortion, as well as their determinants, are limited. The aim of the study was to assess the magnitude and determinants of CMDs following abortion. The study was conducted in five health institutions in Addis Ababa among 460 women aged 18-49 years who had had at least one abortion. The single population proportion formula was used to calculate sample size. Purposive sampling techniques were used to select the health facilities, and consecutive sampling was used to enrol participants into the study. We collected, cleaned, reviewed, and checked the data for completeness using Kobo Toolbox before exporting into SPSS version 27 software for analysis. Descriptive statistics and binary and multiple logistic regressions were computed using a 95% confidence level. The magnitude of CMDs was 18.2% at a confidence interval (CI) of (0.15, 0.22). Being not co-habited with a partner (AOR= 3.18; 95% CI (1.03, 9.84)), belonging in the category of non-paying occupations (AOR= 2.17; 95% CI (1.11, 4.24)), having a living child (AOR= 0.46; 95% CI (0.22, 0.98)), contraceptive use before conception (AOR= 0.46; 95% CI (0.22, 0.96)), substance use (AOR= 3.93; 95% CI (1.92, 8.03)), intimate partner emotional violence (AOR= 5.09; 95% CI (1.06, 24.33)), stigma and discrimination (negative stereotyping (AOR= 1.11; 95% CI (1.05, 1.16)) and discrimination and exclusion (AOR= 1.86; 95% CI (1.78, 2.94)) were factors associated with CMDs after abortion among the women. Therefore, one in five women who have had an abortion experience CMDs. This highlights the need for comprehensive counseling services as an addition to abortion services and increase awareness on the problem among healthcare providers and service users. *(Afr J Reprod Health 2025; 29 [9s]: 67-81).*

Keywords: Common mental disorders, abortion, women of reproductive age

Résumé

La prévalence des troubles mentaux courants (TMC) chez les femmes ayant subi un avortement est mal connue. Cet article porte sur l'apparition de ces troubles après un avortement, en se concentrant sur l'Afrique subsaharienne, et plus particulièrement sur l'Éthiopie, où les connaissances sur l'incidence des TMC après un avortement, ainsi que sur leurs déterminants, sont limitées. L'objectif de l'étude était d'évaluer l'ampleur et les déterminants des TMC après un avortement. L'étude a été menée dans cinq établissements de santé d'Addis-Abeba auprès de 460 femmes âgées de 18 à 49 ans ayant subi au moins un avortement. La formule de la proportion de population unique a été utilisée pour calculer la taille de l'échantillon. Des techniques d'échantillonnage raisonné ont été utilisées pour sélectionner les établissements de santé, et un échantillonnage consécutif a été utilisé pour recruter les participantes. Nous avons collecté, nettoyé, examiné et vérifié l'exhaustivité des données à l'aide de Kobo Toolbox avant de les exporter vers le logiciel SPSS version 27 pour analyse. Des statistiques descriptives et des régressions logistiques binaires et multiples ont été calculées avec un niveau de confiance de 95 %. L'ampleur des CMD était de 18,2 % avec un intervalle de confiance (IC) de (0,15, 0,22). Français Ne pas cohabiter avec un partenaire (AOR = 3,18 ; IC à 95 % (1,03, 9,84)), appartenir à la catégorie des professions non rémunérées (AOR = 2,17 ; IC à 95 % (1,11, 4,24)), avoir un enfant vivant (AOR = 0,46 ; IC à 95 % (0,22, 0,98)), utilisation de contraceptifs avant la conception (AOR = 0,46 ; IC à 95 % (0,22, 0,96)), consommation de substances (AOR = 3,93 ; IC à 95 % (1,92, 8,03)), violence émotionnelle du partenaire intime (AOR = 5,09 ; IC à 95 % (1,06, 24,33)), stigmatisation et discrimination (stéréotypes négatifs (AOR = 1,11 ; IC à 95 % (1,05, 1,16)) et la discrimination et l'exclusion (ORA = 1,86 ; IC à 95 % (1,78, 2,94)) étaient des facteurs associés aux troubles cognitifs majeurs après un avortement chez les femmes. Par conséquent, une femme sur cinq ayant subi un avortement subit des troubles cognitifs majeurs. Cela souligne la nécessité de services de conseil complets en complément des services d'avortement et de sensibiliser davantage les professionnels de santé et les usagers à ce problème. *(Afr J Reprod Health 2025; 29 [9s]: 67-81).*

Mots-clés: Troubles mentaux courants, avortement, femmes en âge de procréer

Introduction

Common mental disorders (CMDs) are distinct, disabling psychiatric conditions like depression, anxiety, and somatoform disorders, often considered a single entity due to their co-morbidity, epidemiology, and presentation.[1–3] Globally, 300 million (4.4%) and 264 million (3.6%) people suffer from depression and anxiety, respectively, and more than 80% of this burden occur in low-and middle-income countries (LMIC), contributing to 7% of the global burden of diseases and 19% of all years lived with disability.[4,5–7]

Abortion is defined by the World Health Organization (WHO) as the termination of a pregnancy before 20[8] or 24[9] weeks of gestation, that can occur spontaneously or with medical help. Pregnancy loss is often a major life event that can cause significant physical and psychological pain and suffering, especially in women who have had abortions. [10] A meta-analysis of the relationship between abortion and indicators of mental health found that women who had had an abortion had an 81% higher risk of developing mental health problems, and nearly 10% of the incidence of mental health problems was directly attributable to abortion.[11]

Study findings have shown a positive relationship between abortion and mental health difficulties among some women, such as stress, anxiety, depression, and low self-esteem.[12] Post-abortion CMDs, can manifest years after having an abortion or reoccur on a regular basis, with symptoms such as depression, shame, guilt, and low self-esteem. These may also be experienced by some women who have encountered miscarriage.[10,13,14] On the contrary, other studies argue that termination of an unwanted pregnancy, as a life event, does not elevate the risk of CMDs in women without a psychiatric history; however, it may marginally increase the risk for those with CMDs in the past [15].Our study focused on women who have no prior mental health problems.

Ethiopia's abortion law allows safe abortions under certain conditions, including rape, pregnancy endangerment, and young age incompetence[16]. Induced abortions are considered safe for women of reproductive age in a setting where skills and resources are appropriate like comprehensive abortion care that includes information, management, and post-abortion care.[9] In Ethiopia, the abortion rate increased from 22 per 1,000 women aged 15 to 49 in 2008 to 28 per 1,000 in 2014, with urban cities having higher rates.[10,14] Women who terminated their pregnancies due to abortion often experience subsequent CMDs[5-7,17]

In Ethiopia, mental illness is the most prevalent non-communicable disorder.[18] Ethiopian health strategies prioritize mental health issues, with post-abortion mental health difficulties identified as being the most challenging. Improving primary care for CMDs can bring considerable health and economic advantages.[7] Abortion-induced mental health issues can negatively impact women's lives and therapy outcomes.[10] The 2017 WHO report indicated that the prevalence of depression and anxiety in Ethiopia was 4.7% and 3.3%,[19] respectively. Research data published across several regions of the country revealed that the prevalence of CMDs within the general population ranged from 11.7% to 33.6%.[20] Despite the high prevalence of CMDs in the general population, there is a knowledge gap regarding the occurrence of post-abortion CMDs in women who have undergone abortions. Therefore, this research project aims to fill this gap by assessing the magnitude of CMDs and associated factors to provide evidence relevant for both policymakers and healthcare providers for the benefit of women's health.

Methods

Study area and period

The study was conducted in five health institutions (hospitals and higher clinics) under Addis Ababa city administration that provide abortion services in Addis Ababa, the capital and largest city of Ethiopia. St. Paul Hospital, Tirunesh Beijing Hospital, Ghandi Memorial Hospital, Yekatit 12 Medical College General Hospital, and Family Guidance Association Ethiopia clinic were selected based on their abortion case flow reports that was obtained from the Addis Ababa Health Bureau. The study was conducted from June to August 2024.

Study design and population

The research project utilized a cross-sectional study design using a quantitative survey administered over the phone to women of reproductive age (18-49 years) who came to the selected health facilities

for abortion services and/or post abortion care (at gestational age of less than 28 weeks) during the data collection period.

Inclusion and exclusion Criteria

Inclusion criteria:

- women in the age group of 18-49 years who came to the health facilities for abortion or post abortion care during the data collection period, or had at least one abortion in the month prior to the survey and
- women who were willing to participate in the research project.

Exclusion criteria:

- Critically ill women during data collection period

Sample size determination

The sample size was determined based on objectives, study design and population of interest. Therefore, the sample size was calculated using a single population proportion formula using a 95% confidence level, 50% expected population proportion of CMDs (there was no prior study done with similar design and population), 5% margin of error, and Zα/2, a Z-value of 1.96, corresponding to a 95% level of significance.

$$n = \frac{(\mathrm{Z}\alpha/2)2 * \mathrm{p} * (1-\mathrm{p})}{\mathrm{e}2}$$

$$n = \frac{(1.96)2 * 0.5 * (1-0.5)}{(0.05)2} \quad n = 384$$

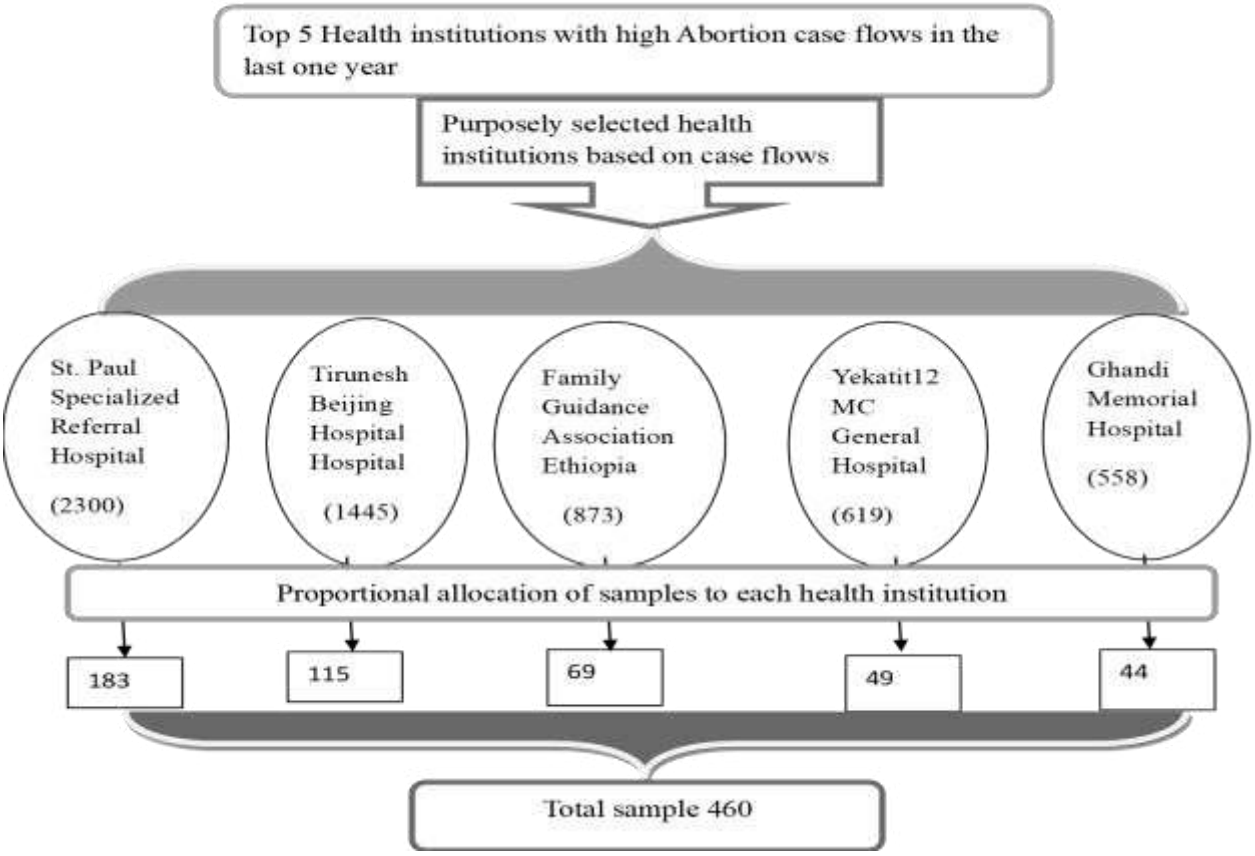
We added 20% non-response rate (the non-response rate of data collected from women via phone was high due to potential network issues, mobile malfunctions, or lack of free time). The total sample size was 460 women selected from health facilities.

Sampling methods

The health facilities providing abortion services and post-abortion care were selected purposefully based on their abortion case flows in the year before data collection, and then the samples were allocated to each health facility proportionally. Based on the 2023/24 client flow of the health institution obtained from the Addis Ababa Health bureau, St. Paul Hospital, Tirunesh Beijing Hospital, Ghandi Memorial Hospital, Yekatit 12 Medical College General Hospital, and Family Guidance Association Ethiopia were selected as the study areas. To ensure an adequate sample within the allotted data collection period, we included health facilities with a case flow of more than 500 in a year as a study area. A consecutive sampling technique was used after the selection of each health facility to enroll the participants into the study. Based on the report of each of the health facilities from the Addis Ababa health bureau, the total number of women who had received comprehensive abortion care services in the year prior to data collection in selected health institutions was calculated to be 5,795. Figure 1

Data collection tools and techniques

The CMDs was measured by the Self-Reporting Questionnaire-20 (SRQ-20) which was developed by the WHO as part of a collaborative study on strategies for extending mental health care. The SRQ-20 is a tool designed for LMIC's primary healthcare settings to detect patient-reported non-specific mental distress, like depressive, anxiety, somatic symptoms and suicidal ideation presenting in the past 30 days, after exposure to an abortion [21] using a yes/no answer format. SRQ-20 was administered by trained interviewer. A "yes" response typically receives a score of 1, while a "no" response receives a score of 0. A score of 1 indicates that the symptom was reported to be present during the past month, a score 0 indicates that the symptom was absent. The maximum total score for SRQ-20 is 20 and minimum is 0, with a higher total score indicating higher levels of CMDs symptoms.[22] The SRQ-20 consists of 20 short Yes/No questions that inquire about the presence of anxiety, depression, and psychosomatic symptoms. It was validated in Ethiopia and had excellent internal consistency, measured by Cronbach's alpha in two validation studies: studies 1 and 2 with 0.84 and 0.88, respectively, with a high internal consistency reliability coefficient (Cronbach's alpha = 0.86). Study participants who score a total of 6 or higher on the SRQ-20, are determined to have symptoms of CMDs. The SRQ-20 was administered 30 days/ one month after the abortion services. The WHO proposed a one-month, or 30-day period for screening for the existence of CMDs in order to standardize the way the questionnaire is completed. Another reason is to allow time for short-term mood or stress fluctuations to pass, as these are common. Yet, they are not always indications for CMDs.



NB: In Figure 1, the data displayed was obtained from the Addis Ababa Health Bureau report of each health facilities in the year 2023/24

Figure 1: Schematic diagram of the sampling technique and proportional allocation of the sample to each selected Addis Ababa health institutions (N=460)

A one-month period helps to filter out those experiences and focus on more persistent or recurring symptoms.

Another tool included for data collection is the ENRICH Marital Satisfaction (EMS) Scale. This is composed of 15 items, which are answered on a five-point scale (between 1 = Strongly Disagree and 5 = Strongly Agree), and includes two dimensions: marital satisfaction (MS) and idealized distortion (ID). The scale scoring was carried out by summing up the items and by reversing the values of items 2, 5, 8, 9, 12, and 14. The specified values were reversed because they contain negative items scored in a negative direction. Therefore, a reverse-scoring was first carried out, before the summing up of the appropriate items for each scale. For instance, if an item is marked 5, it would be scored 1; if marked 4, it would be scored 2; a 3 remains unchanged and the rest are reversed accordingly. The total score of the scale was calculated by using the formula: EMS = MS - [(MS) x (correlation between MS and ID)^2 x (ID x 0.01)]. The higher scores represent higher levels of marital satisfaction.[23,24]

Intimate partner violence, IPV (physical, emotional, and sexual violence) was measured based on women's self-reported responses to questions asked about whether or not they had experienced a number of violent acts within their relationship, perpetrated by their husband/partner for currently married women and recent husbands/partners for previously married women (including widows).

- Physical IPV was assessed by asking participants seven questions regarding having ever been pushed, shaken, or have had something at her; slapped; had her arm twisted or hair pulled; punched with a fist or with something that could hurt; kicked, dragged, or beaten up; been choked or burnt on purpose; or have been threatened or attacked with a knife, gun, or any other weapon.

- Three questions were asked to measure sexual IPV: having ever been physically forced to have sexual intercourse with her partner even when she did not want to, physically forced to perform any other sexual acts she did not want to, or forced with threats or in any other way to perform sexual acts she did not want to.
- psychological/emotional IPV was assessed by asking three questions: if the participant had ever been humiliated, threatened, or insulted or made to feel bad about herself.[25,26]

Furthermore, the Stigmatizing Attitudes, Beliefs, and Actions Scale (SABAS) was an 18-item scale that measured community-level abortion stigma and originally has three dimensions (subscales). However, for the purpose of this study, only two dimensions (subscales) of SABAS were used because the third dimension was deemed not relevant to the objectives of this study. Those relevant for this study are: 1) negative stereotypes about women who are associated with abortion (8 items); 2) discrimination/exclusion of women who have abortions (7 items). The SABAS item response categories for this subscale are based on a five-point Likert scale that ranges from "strongly disagree" to "strongly agree," with each response assigned a value from 1 to 5. Overall scores are obtained by adding individual responses, with higher overall scores representing more stigmatizing attitudes.[27]

Study variables

The dependent variable of the study is CMDs(yes/no). The independent variables are demographic factors, reproductive health characteristics, and factors including chronic medical illness, substance use, intimate partner violence, marital satisfaction, family history of mental illness, stigma and discrimination.

Data management and analysis

The data were collected, cleaned, reviewed and checked for completeness using Kobo Toolbox initially, and finally exported into SPSS version 27 software for analysis. Descriptive statistics such as frequency, percentile, standard deviation and mean were calculated, and presented in tables and text. Binary and multiple logistic regressions were computed to see the factor that influence the dependent variable using a 95% CI and at p-value of <0.05 level of significance.

Data quality assurance

The SRQ-20, a standard and validated tool developed by the WHO was used to measure CMDs for this study. Originally the questionnaire was developed in English but was translated to Amharic (the official language in Ethiopia) by mental health experts for usability. The translated tool was revised after discussion with language experts and professionals familiar with the topics, and the final version was used for data collection. The questionnaires were pre-tested in 5% of the sample in other hospital whose populations were similar and necessary amendments were made. The fieldwork team consisted of highly skilled and experienced professionals: Five BSc (Bachelor of Science) midwife data collectors and two MSc (Master of Science) mental health supervisors. All members of the fieldwork team participated in a 2-day training on the content of the tool and data collection procedures, and supervisors conducted daily data accuracy and consistency checks.

Ethical considerations

Ethical approval was obtained from Addis Ababa University, College of Health Sciences, Institutional Review Board, and Addis Ababa Health Bureau. Participants gave written informed consent prior to the interview, and confidentiality was maintained throughout the data collection process. Women had the option to leave the interview at any moment or to skip any questions they did not wish to answer throughout the phone interviews. Before approaching the women at the pre-abortion care unit, where women go to discuss their abortion options, procedure, treatment outcome, and so on, the service providers mentioned the study to them privately and asked for their permission to share their information with the study team. The interviewers then explained the project's purpose and informed women that they would receive abortion care regardless of whether they chose to participate in the study or not. They also explained that the study had no link to the treatment or decision about care received. Those who agreed to sign a consent form were told that they would be called after 30 days for an interview. For those who never educated, the research teams read the consent several times with further explanations until they understood their involvement. After they agreed to participate, they signed an agreement using their

thumbprint, which is accepted locally as a signature. They received assurances that their data and contact details would not be shared with a third party without their consent. After signing an informed consent form, sociodemographic details, reproductive history, and clinical data were gathered. They were also reminded one week prior to the actual data collection/interview in order to find out when they might be available. On day 30, the study team called the women and collected the data. Unless the woman volunteered, the data collector didn't use the word "abortion" during the interview to avoid potential leaks of information.

Results

We recruited 460 women who were eligible for the study, and 460 agreed to participate or to be called 30 days later. 428 women completed the survey from June to August 2024, yielding an overall response rate of 93.04%.

Socio-demographic characteristics

The mean age of the women who had abortions in the five study facilities was 25.91 (SD ± 5.64) years, and 66.1% of them reported they were co-habiting with their husband or partner, while 11% could not read or write, more than one-third completed elementary school (34.6%) and 54.4% completed high school or above. 59.6% of participants were in a non-payable occupation, and 83.2% of participants lived in urban areas. The median monthly income was 3200.00 Ethiopian Birr, with an interquartile range of 3000 and nearly half (48.8%) of the research participants had no living children. (Table 1)

Reproductive health characteristics

Among women who participated in the study, 42% reported that this was their first pregnancy. Among those who had at least one other pregnancy, 54.0% reported that the prior pregnancy occurred more than two years ago (see Table 2). Among women who received abortion services, 91.4% of them reported having a future plan to have a child. 61.7% of women reported that the current pregnancy was planned, and 20.6% had had at least one previous abortion, with the majority reported as spontaneous (88.6%) (see Table 2).

More than half (59.6%) of women reported that the most recent pregnancy, for which they experienced an abortion, was in the second trimester (13–28 weeks), and 92.1% reported that the pregnancy had ended spontaneously. Fetal health problems accounted for 40.0% of the reasons given

Table 1: Socio-demographic characteristics of women who had an abortion in Addis Ababa health facilities, 2024. (N=428)

Variables		Frequency	Percent
Age range	18-26 years	250	58.4
	27-49 years	178	41.6
Mean age = 25.91		Std. Deviation = 5.642	
Marital status	Co-habiting	283	66.1
	Not co-habiting	145	33.9
Educational status	Never been educated	47	11.0
	Elementary school (Grade 1 to 8)	148	34.6
	High school (Grade 9 to 12)	133	31.0
	College diploma and above	100	23.4
Income in ETB	Median income = 3200.00	Interquartile Range = 3000	
Occupation	Payable occupations	173	40.4
	Non-payable occupations*	255	59.6
Place of residence	Urban	356	83.2
	Rural	72	16.8
Living Child/ children	Yes	219	51.2
	No	209	48.8

*Non-payable occupation includes housewives, students and women who were unemployed. ETB=Ethiopian Birr

Table 2: Reproductive health characteristics of women who had an abortion in Addis Ababa health facilities, 2024. (N=428)

Variables		Frequency	Percent
Number of pregnancy	One	180	42.0
	Two	172	40.2
	Three or more	76	17.8
Time gap between the current and previous pregnancy (N=248)	Less than a year	55	22.2
	one to two years	59	23.8
	Above two years	134	54.0
Plan to have a child in the future	Yes	391	91.4
Pregnancy planned	Yes	264	61.7
History of previous abortion	Yes	88	20.6
Number of previous abortions (N=88)	Once	69	78.4
	Twice	13	14.8
	Three or more times	6	6.8
Previous type of abortion (N=88)	Spontaneous	78	88.6
	Induced	10	11.4
Length of current pregnancy	First trimester (1-12 weeks)	173	40.4
	Second trimester (13-28 weeks)	255	59.6
Current pregnancy terminated	Spontaneously	394	92.1
	Induced	34	7.9
Reason for abortion (N=428)	I am single	37	8.6
	I am at school	23	5.4
	Not employed/economic problem	27	6.3
	I want Spacing	55	12.9
	Recommended by physician	40	9.3
	Maternal health problem	75	17.5
	Fetal health problem	171	40.0
Recent pregnancy caused by	Casual sex	167	39.0
	wanting to get pregnant	88	20.5
	I was negligent	79	18.5
	Contraceptive failure	44	10.3
	By having sexual intercourse without a consent	44	10.3
	By Having sexual intercourse with family members or close relatives	6	1.4
Have you ever used family planning methods?	Yes	365	85.3

Table 3: Distribution of factors influencing CMDs among women who had an abortion in Addis Ababa health facilities. (N=428)

Variables			Frequency	Percent
Diagnosed with chronic medical illness		Yes	17	4.0
Family history of mental illness		Yes	4	0.9
Perceived stress		Low perceived stress	13	3.0
		Moderate perceived stress	341	79.7
		High perceived stress	74	17.3
Ever used substances?		Yes	74	17.3
Stigma and discrimination		Negative Stereotyping	Mean	22.03
			Std. Deviation	6.17
		Discrimination and Exclusion	Mean	16.48
			Std. Deviation	3.77
ENRICH Marital Satisfaction		Mean	49.65	
		Std. Deviation	5.32	
	Sexual	Yes	62	14.5
Intimate partner violence	Physical	Yes	81	18.9
	Psychological	Yes	27	6.3

Table 4: SRQ-20 score of women who had had an abortion in Addis Ababa health facilities. (N=428)

SRQ-20 items	Yes (%)	No (%)	SRQ-20 score ≥6.
Do you often have headaches	88 (20.6)	340 (79.4)	
Is your appetite poor	55 (12.9)	373 (87.1)	
Do you sleep badly	86 (20.1)	342 (79.9)	
Are you easily frightened	88 (20.6)	340 (79.4)	
Do your hands shake	25 (5.8)	403 (94.2)	**18.2% CI (0.15, 0.22)**
Do you feel nervous, tense or worried	132 (30.8)	296 (69.2)	**P-Value ≤0.0001**
Is your digestion poor	57 (13.3)	371 (86.7)	
Do you have trouble thinking clearly	39 (9.1)	389 (90.9)	
Do you feel unhappy	97 (22.7)	331 (77.3)	
Do you cry more than usual	100 (23.4)	328 (76.6)	
Do you find it difficult to enjoy your daily activities	45 (10.5)	383 (89.5)	
Do you find it difficult to make decisions	35 (8.2)	393 (91.8)	
Is your daily work suffering	40 (9.3)	388 (90.7)	
Are you unable to play a useful part in life	15 (3.5)	413 (96.5)	
Have you lost interest in things	45 (10.5)	383 (98.5)	
Do you feel that you are a worthless person	42 (9.8)	386 (90.2)	
Has the thought of ending your life been on your mind	40 (9.3)	388 (90.7)	
Do you feel tired all the time	40 (11.2)	380 (88.8)	
Do you have uncomfortable feelings in your stomach	114 (26.6)	314 (73.4)	
Are you easily tired	51 (11.9)	377 (88.1)	

for their decision to seek an abortion, with maternal health problems following in second at 17.5%. One in ten respondents (10.3%) reported that their current pregnancy was the result of having sexual intercourse without their consent, and 1.4% reported having sexual intercourse with family members or near relatives. 14.7% of the study participants reported that they were not using a contraceptive method before conception.

Factors related to CMDs

A few participants reported being diagnosed with a chronic medical condition other than CMDs (4.0%) and reported a family history of mental illness (0.9%). Most women (79.7%) described themselves as moderately stressed and 17.3% of all respondents stated they had used addictive substances such alcohol, cigarettes, cannabis, or sedatives. The study also revealed that the mean scores of negative stereotyping, and discrimination and exclusion experienced by the women who replied were 22.03 (SD ±6.17), and 16.48 (SD ±3.77 respectively. According to the ENRICH Marital Satisfaction Scale, the mean marital satisfaction of those who completed the scale was 49.65 (SD ±5.32). Almost one-fifth (18.9%) of participants reported to have experienced physical violence, 14.5% experienced sexual violence and 6.3% reported psychological violence perpetrated by an intimate partner in the previous year. (Table 3)

Magnitude of CMDs following abortion among women of reproductive age in five study facilities, Addis Ababa

In general, women who had abortion services at one of the five health facilities included in the study had a prevalence of CMDs of 18.2% at a confidence interval (CI) of (0.15, 0.22) using the SRQ-20 with a cutoff point ≥6. Table 4

Logistic regression analysis of factors that are associated with CMDs among women who had had abortion in Addis Ababa health institutions (N=428).

After adjusting for possible confounding factors, the multiple logistic regression analysis revealed the women who were not co-habited with their partner were 3.18 times (AOR= 3.18; 95% CI (1.03, 9.84)) more likely to exhibit symptoms of CMDs after having an abortion, at a p-value of 0.045. Respondents working in non-paying occupations had double the likelihood of reporting CMDs compared to those who had a salary (AOR= 2.17; 95% CI (1.11, 4.24) p-value 0.024). Women who had at least one living child had 0.46 times lower odds of experiencing a CMDs than nulliparous women (AOR= 0.46; 95% CI (0.22, 0.98) p-value 0.045).

Table 5: Factors associated with experiencing post-abortion CMDs among women who had had an abortion in Addis Ababa health facilities. (N=428)

Variables			CMDs Yes (SRQ-20 ≥6) N	No (SRQ-20<6) N	COR , 95% CI	AOR, 95% CI	p-value
Age	Age from 18-26 years		60	190	2.81, (1.59, 4.95)	1.48 (0.66, 3.32)	0.34
	Age from 27-49 years		18	160	1.00	1.00	
Marital status	Co-habited		251	32	1.00	1.00	
	Not co-habited		99	46	3.65, (2.19, 6.06)	**3.18 (1.03, 9.84)**	**0.045***
Occupation	Payable occupation		23	150	1.00	1.00	
	Non-payable occupation		55	200	1.79 (1.06, 3.05)	**2.17 (1.11, 4.24)**	**0.024***
Living Child/ children	Yes		20	199	0.26 (0.15, 0.45)	**0.46 (0.22, 0.98)**	**0.045***
	No		58	151	1.00	1.00	
Hospital stays hours	Mean ± Std.D		22.94 ± 13.105		1.03 (1.01, 1.05)	1.01 (0.99, 1.03)	0.425
Pregnancy was planned/desired	Yes		35	229	1.00	1.00	0.321
	No		43	121	2.33 (1.41, 3.82)	1.71 (0.59, 4.96)	
History of previous abortion	Yes		9	79	2.24 (1.07, 4.68)	2.26 (0.89, 5.70)	0.085
	No		69	271	1.00	1.00	
Length of current pregnancy (GA)	1-12 weeks (1st trimester)		24	149	0.60 (0.36, 1.01)	0.54 (0.29, 1.02)	0.056
	13-28 weeks (2nd trimester)		54	201	1.00	1.00	
Current pregnancy terminated	Spontaneously		62	332	1.00	1.00	
	Induced		16	18	4.76 (2.30, 9.84)	2.53 (0.95, 6.72)	.064
Contraceptive use before conception	Yes		56	309	0.34 (0.19, 0.61)	**0.46 (0.22, 0.96)**	**0.039***
	No		22	41	1.00	1.00	
Ever substance use	Yes		27	47	3.41 (1.95, 5.97)	**3.93 (1.92, 8.03)**	**0.000***
	No		51	303	1.00	1.00	
Intimate partner violence	Sexual	Yes	19	43	2.30 (1.25, 4.22)	2.27 (0.97, 5.28)	0.058
		No	59	307	1.00	1.00	
	Physical	Yes	16	65	1.13 (0.61, 2.0)	1.66 (0.28, 2.55)	0.338
		No	62	285	1.00	1.00	
	Psychological	Yes	75	326	1.84 (0.54, 6.27)	**5.09 (1.06, 24.33)**	**.042***
		No	3	24	1.00	1.00	
Stigma and discrimination	Negative Stereotyping		Mean ± Std.D	22.03±6.17	1.08 (1.03, 1.12)	**1.11 (1.05, 1.16)**	**0.000***
	Discrimination and Exclusion		Mean ± Std.D	16.48±3.77	1.95 (1.89, 2.01)	**1.86 (1.78, 2.94)**	**0.001***

Hint: * indicates the variable is significant at p-value less than 0.05. Std.D = Standard deviation

Research participants who had used a contraceptive method prior to conception were 0.46 times less likely to have had a CMDs (AOR= 0.46; 95% CI (0.22, 0.96) P-values 0.039). The likelihood of a CMDs was found to be nearly four times higher for women who have used a substance (AOR= 3.93; 95% CI (1.92, 8.03) p-value 0.000).

Participants who experienced psychological IPV were five times more likely than women who had not to be associated with the CMDs (AOR= 5.09; 95% CI (1.06, 24.33) p-value 0.042).

A unit change in Negative Stereotyping would have an increased chance of having a CMDs by an odd of 1.11 (AOR= 1.11; 95% CI (1.05, 1.16), p-value 0.000), and also a unit change in Discrimination and Exclusion would increase the chance of CMDs to increase by an odd of 1.86 (AOR= 1.86; 95% CI (1.78, 2.94), p-value 0.001). (Table 5).

Discussion

The primary objective of this research project was to establish the extent of and identify determinants of CMDs following abortion among women who had had abortions in Addis Ababa health institutions. The study found that 18.2% of women who had an abortion were classified as having CMDs thirty days postabortion. A Brazilian study found that 13.7% of women who attempted abortions had CMDs, with higher rates among unmarried, less educated, and unemployed women.[28] However, even though that study used the SRQ-20 tool, the findings are not comparable because the current study focused on the magnitude of CMDs among those who completed abortion in the past one month, while the other study only focused on attempted abortions. The magnitude of attempting abortion might have been higher than those who completed the abortion, leading to an overestimation of the results.[11] Another longitudinal study, estimated a 25% higher prevalence of mental health problems among those who experienced pregnancy loss compared to those who did not have an abortion/miscarriage. According to a New Zealand study, women who had abortions had a 30% higher prevalence of mental health issues than women who had other pregnancy outcomes, which may indicate a slight rise in mental health disorders after abortion.[28,29] Similarly another study found that women who had an abortion had an 81% increased risk of mental health problems, with nearly 10% of these problems being directly attributed to the procedure. This indicates that women who had an abortion had a higher risk of various mental health issues compared to those who had not.[30] The present study analyzed post-abortion mental health outcomes, indicating that women's CMDs may not be masked by immediate post-abortion grief, but rather by underlying factors. It aligns with other studies and addresses an importance public concern.

According to a study conducted in Finland using national health registries, cohabitation status and CMDs were significantly correlated, indicating that being married or cohabitating is linked to a lower CMDs like depression score.[31] The current data, which show that women who were cohabiting (in a relationship) had a significantly lower experience with CMDs after controlling for confounding variables, confirm this finding. This might be because cohabiting people support one another both physically and emotionally. Additionally, this study found that some sociodemographic characteristics either facilitated or hinder the onset of mental health problems in women who had had abortions.

CMDs were found to be significantly predicted by non-payable occupations such as housemaids or housewives in this study. These women perform duties that are often undervalued and, as a result, may experience negative effects on their mental and emotional health, including low self-esteem and feelings of insecurity. Those who experienced unemployment (housewives, students and anyone who were unemployed) also reported a higher prevalence indicating that providing more employment opportunities for women could also help improve their mental health

A significant association was found between having living children regardless of age and income and a decreased risk of the presence of a CMDs among the study participants. Among mothers with living children, the likelihood of CMDs was 66% lower than in those without children. Several factors may contribute to this, including the sense of fulfillment and purpose that often accompany motherhood. Individuals who have children might also benefit from the support networks that typically develop within families.[6,32–34]

The results of the current study indicated that participants who utilized contraceptives before getting pregnant experienced a 54% reduced likelihood of developing CMDs. The potential rationale for this may be that a woman's life and future planning might be enhanced by the utilization of contraception, which may subsequently improve her mental and emotional well-being.[28,34,35] They may receive preparation time for pregnancy and childbirth, either psychologically or economically, which could assist them in managing symptoms of CMDs.[36]

Substance use and CMDs after abortion were highly associated. This could be that symptoms of CMDs can be provoked by substance use, and substance use symptoms could sometimes coincide with symptoms of CMDs. Women who have been using substances such as alcohol or other drugs might be engaged in unprotected sexual behavior, which in turn contributes to unplanned pregnancies and abortions.[37] According to the results of various studies, those who had experienced mental health problems were more inclined to use substance. Some of the women who were more likely to struggle with their mental health following an abortion were also substance users. [29,30] A longitudinal study conducted elsewhere found women who had had an abortion had a higher likelihood of experiencing substance use disorders.[38]

Study participants who reported experiencing psychological intimate partner violence during this pregnancy were more likely to experience CMDs following an abortion. Other research findings also reported that there exists a direct correlation between the experience of intimate partner violence and mental health consequences, including anxiety and depression.[39] Abortion-related emotional reactions may be influenced by messages from partners or relatives.

It has been discovered that there is a substantial correlation between CMDs[40] and the stigma and discrimination subscales (negative stereotyping and discrimination and exclusion). Because of negative opinions and treatment of these women, it can worsen mental health problems and make it more difficult for them to get the help they need. According to other study, the incidence of mental health issues related to abortion might also be raised by external factors such family pressure, unfavorable public perceptions, and negative experiences of women who had had abortions.[41]

Limitation of the study

- The cross-sectional nature of the study does not allow analysis of the cause-effect relationship
- The study's sample was limited to five facilities, potentially limiting generalizability.
- Mental health was not measured before the abortion, making it impossible to determine how abortion affects the outcome.
- The scope of the study did not address abortion decision-making among the women.

Conclusion and recommendations

The findings of this study underscore the importance of interventions that focus on comprehensive mental health-related counseling services for women undergoing abortions and to ensure access to family planning services, substance use cessation programs, address intimate partner violence, stigma, and discrimination. Referral pathways for counselling services should be in place and these services should be available and accessible to all women who need them as it will be helpful to prevent CMDs. The government, program planners, and implementers should develop and implement counseling services and mental health support for women during abortion services that also address stigma and discrimination.

Availability of data and materials

Upon reasonable request, the authors will provide the data along with the supporting data sets used in the study.

Competing interest

The authors declare that there were no competing interests.

Contribution of authors

BW did conception, design of the study, developed the question, collected data, performed the statistical analysis and interpretations, manuscript preparation and edition, ST, MD and DB edited,

commented, reviewed and approved the study design, research questions, and the final analysis and manuscripts. All authors approved and read the final manuscript.

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Annex 1: SPSS output of Frequency and percentage distribution of the ENRICH Marital satisfaction of women who sought abortion in Addis Ababa health facilities. (N=309)

		frequency	percent
1. (+) My partner and I understand each other perfectly.	Strongly Disagree	13	4.2%
	Moderately Disagree	11	3.6%
	Neither Agree nor Disagree	45	14.6%
	Moderately Agree	124	40.1%
	Strongly Agree	116	37.5%
	Total	309	100.0%
2. (—) I am not pleased with the personality characteristics and personal habits of my partner.	Strongly Agree	80	25.9%
	Moderately Agree	92	29.8%
	Neither Agree nor Disagree	92	29.8%
	Moderately Disagree	27	8.7%
	Strongly Disagree	18	5.8%
	Total	309	100.0%
3. (+) I am very happy with how we handle role responsibilities in our marriage.	Strongly Disagree	8	2.6%
	Moderately Disagree	13	4.2%
	Neither Agree nor Disagree	64	20.7%
	Moderately Agree	103	33.3%
	Strongly Agree	121	39.2%
	Total	309	100.0%
4. (+) My partner completely understands and sympathizes with my every mood.	Strongly Disagree	9	2.9%
	Moderately Disagree	12	3.9%
	Neither Agree nor Disagree	70	22.7%
	Moderately Agree	124	40.1%
	Strongly Agree	94	30.4%
	Total	309	100.0%
5. (-) I am not happy about our communication and feel my partner does not understand me.	Strongly Agree	105	34.0%
	Moderately Agree	87	28.2%
	Neither Agree nor Disagree	87	28.2%
	Moderately Disagree	14	4.5%
	Strongly Disagree	16	5.2%
	Total	309	100.0%
6. (+) Our relationship is a perfect success.	Strongly Disagree	10	3.2%
	Moderately Disagree	9	2.9%
	Neither Agree nor Disagree	66	21.4%
	Moderately Agree	128	41.4%
	Strongly Agree	96	31.1%
	Total	309	100.0%
7. (+) I am very happy about how we make decisions and resolve conflicts.	Strongly Disagree	12	3.9%
	Moderately Disagree	12	3.9%
	Neither Agree nor Disagree	64	20.7%
	Moderately Agree	118	38.2%
	Strongly Agree	103	33.3%
	Total	309	100.0%
8. (-) I am unhappy about our financial position and the way we make financial decisions.	Strongly Agree	80	26.0%
	Moderately Agree	98	31.8%
	Neither Agree nor Disagree	84	27.3%
	Moderately Disagree	28	9.1%
	Strongly Disagree	18	5.8%
	Total	308	100.0%
9. (—) I have some needs that are not being met by our relationship.	Strongly Agree	58	18.8%
	Moderately Agree	80	25.9%
	Neither Agree nor Disagree	101	32.7%
	Moderately Disagree	46	14.9%
	Strongly Disagree	24	7.8%
	Total	309	100.0%
10. (+) I am very happy with how we manage our leisure activities and the time we spend together.	Strongly Disagree	11	3.6%
	Moderately Disagree	6	1.9%

	Neither Agree nor Disagree	73	23.6%
	Moderately Agree	114	36.9%
	Strongly Agree	105	34.0%
	Total	309	100.0%
11. (+) I am very pleased about how we express affection and relate sexually.	Strongly Disagree	9	2.9%
	Moderately Disagree	12	3.9%
	Neither Agree nor Disagree	66	21.4%
	Moderately Agree	107	34.6%
	Strongly Agree	115	37.2%
	Total	309	100.0%
12. (-) I am not satisfied with the way we each handle our responsibilities as parents	Strongly Agree	76	24.6%
	Moderately Agree	84	27.2%
	Neither Agree nor Disagree	106	34.3%
	Moderately Disagree	25	8.1%
	Strongly Disagree	18	5.8%
	Total	309	100.0%
13. (+) I have never regretted my relationship with my partner, not even for a moment.	Strongly Disagree	16	5.2%
	Moderately Disagree	10	3.2%
	Neither Agree nor Disagree	83	26.9%
	Moderately Agree	84	27.2%
	Strongly Agree	116	37.5%
	Total	309	100.0%
14. (—) I am dissatisfied about our relationship with my parents, in-laws, and/or friends.	Strongly Agree	96	31.1%
	Moderately Agree	61	19.7%
	Neither Agree nor Disagree	98	31.7%
	Moderately Disagree	33	10.7%
	Strongly Disagree	21	6.8%
	Total	309	100.0%
15. (+) I feel very good about how we each practice our religious beliefs and values.	Strongly Disagree	5	1.6%
	Moderately Disagree	6	1.9%
	Neither Agree nor Disagree	77	24.9%
	Moderately Agree	92	29.8%
	Strongly Agree	129	41.7%
	Total	309	100.0%