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Information Sources Consulted by Women in African Countries to Manage Menopausal Symptoms: A Systematic Review and Meta-Analysis

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Abstract

Background: Despite an abundance of information regarding menopausal women in western society, African menopausal women have been overlooked in menopausal research, particularly, where they find information regarding menopause. Since inadequate health-related knowledge on menopause negatively affects the understanding of and coping with menopause and related symptoms, it is important to determine where women in Africa obtain their information about menopause. **Aim:** To conduct a systematic review to identify and analyse information sources consulted by menopausal women in the African region regarding the management of menopausal symptoms. **Method:** PubMed, Embase (OVID), Google Scholar, Medline (OVID), Medline in Process (OVID), Scopus, https://www.africabib.org/, African Index Medicus; http://indexmedicus.afro.who.int/, and African Journals Online (AJOL) were searched for publications from January 2000 to April 2017. Fourteen studies met the eligibility criteria. Twelve were quantitative while two were qualitative. Studies were independently appraised by two researchers using checklists from the Centre for Evidence-Based Management. **Results:** Meta-analysis explored the prevalence of different information sources reported with friends being the highest (44%, 95% CI: [0.35, 0.54]) followed by relatives (35%, 95% CI: [0.22, 0.50]) with medical providers being sources of information for only 30% of participants (95% CI: [0.15, 0.50]). **Conclusion:** Information regarding menopause among African women emanated primarily from friends and relatives, suggesting that women perceive menopause as a natural process whereby information is the best gleaned from informal sources. However, health care should aim to increase public awareness of menopause education and strengthen efforts to provide accurate, timely and

helpful information for women and their friends and families.

Keywords

African Countries, Identify and Analyse, Information Sources, Menopausal Symptoms, Systematic Review

1. Introduction

1) What is already known about the topic?

a) Sources of menopausal information are underexplored in the African region.

b) Information sources are consulted by menopausal women in the African region, but there is little information on the preferred sources of such information for the management of menopausal symptoms.

2) What this paper adds

a) Our systematic review and meta-analysis identified only fourteen eligible papers from the five African countries that were involved in the research on information sources consulted by menopausal women in the African region during 2000-2017.

b) Meta-analysis revealed six preferred information sources, with friends as the most frequently reported source of menopause information, followed by relatives; medical providers; television and radio; books, magazines, journals; and religious sources being the lowest.

1.1. Background

Despite an abundance of information regarding menopausal women in western society, African women have been almost overlooked in menopausal research [1] [2]. In most African states, research on menopause and how its symptoms are understood and dealt with in public policy and public health education is minimal [2] [3]. Several studies conducted in the African region confirm that awareness of information about menopause in African women was low [4] [5] [6] [7] [8].

Additionally, issues of menopause such as sources of information are under explored [9]. However, inexperience and inadequate health-related knowledge on menopause negatively affects understanding and coping with menopause and related symptoms. Equally, African menopausal women need support systems from all relevant stakeholders, including health care providers, family and society to effectively manage menopause [4] [6]. Hence, it is important to determine where women in Africa obtain information about menopause [10].

1.2. The Purpose of the Review

This systematic review aimed at identifying and analysing information sources consulted by menopausal women in the African region regarding the manage-

ment of menopausal symptoms. The goal was to enable medical/health service providers to provide their clients with correct information from reliable sources and empower menopausal women to alleviate suffering during menopause. Furthermore, evidence from this review will allow policy makers, such as the ministry of health to devise appropriate interventions that will enable all women, particularly menopausal women, to receive correct information.

The specific objectives of this systematic literature review were to: review relevant African studies since 2000 to date, regarding the sources of information in the management of menopausal symptoms among pre-, peri-, menopause-, and post-menopausal women aged 35 - 90; assess the validity of the findings of the included studies and systematically analyse the relevance of information sources across the African region.

2. Methodology

2.1. Definitions

1) Menopause

Menopause is characterised by absence of menstrual period for 12 consecutive months without biological or physiological cause [4] [11] [12]. Such absence of menstrual period signifies the end of fertility and childbearing years [5] [11]. The end of fertility in a woman's life is characterised by several symptoms brought about by decreased hormonal activity [4]. The most common symptoms associated with menopause are hot flashes, decreased libido, vaginal dryness, insomnia, and bone or joint disorders [3] [5] [13] [14] [15] [16].

2) Pre-menopause:

Pre-menopause is the stage that leads up to peri-menopause. This stage affects most women in their late thirties and early forties. During this period, women are still menstruating regularly, but the estrogen and progesterone levels may begin to change [17].

3) Peri-menopause

Peri-menopause is the stage that occurs before menopause. At this stage, women have a significant drop in estrogen levels, which signifies the end of fertility in a woman's life, coupled by some troublesome symptoms, such as hot flashes, vaginal dryness and slowed metabolism. During this stage, the menstrual period becomes irregular, and women may experience missed periods, shorter menstrual cycles or suffer from longer cycles [17] [18].

4) **Post-menopause**

Post-menopause refers to the time after a woman's menstrual periods have ceased for 12 consecutive months. During the postmenopausal stage, many troublesome symptoms a woman may have experienced during peri-menopause gradually decrease [19].

2.2. Methods

2.2.1. Review Question

A systematic review of the literature was conducted to answer the following

question:

What information sources are consulted by pre-, peri-, menopause-, and post-menopausal women between ages 35 - 90 in the African region in the management of menopausal symptoms since 2000 according to literature obtained from Embase (OVID), Google Scholar, MEDLINE (OVID), MEDLINE in Process (OVID), Pub Med, Scopus plus African specific databases: https://www.africabib.org/, African Index Medicus; http://indexmedicus.afro.who.int/, and African Journals Online (AJOL) https://www.ajol.info/. This review was registered on 12 May 2017 in PROSPERO; the international prospective register of systematic reviews as: PROSPERO 2017 CRD42017065866 and is available from http://www.crd.york.ac.uk/PROSPERO/display_record.phd?ID=CRD42017065866

2.2.2. Design

A systematic literature review was conducted according to the PRISMA statement and guidelines [20].

1) Search strategy

Six databases were searched in April 2017: PubMed, BioMed Central, Embase, Google Scholar, Medline and Medline in Process and Scopus.

2) Search terms

The search strategy was designed in PubMed. In brief this comprised a combination of three sets of search terms:

Menopaus* [in title or abstract] OR Menopause as a *Medical Subject Heading*

AND

(Information OR experience* OR perception* OR health seeking behav* OR knowledge) [In title or abstract] OR Information Seeking Behavior as a *Medical Subject Heading*

AND

A search filter of title/abstract terms to identify research carried out in Africa OR Africa as a *Medical Subject Heading*

Following testing for its ability to identify known relevant studies, the search was then adapted and run in the following additional databases: Embase (OVID), Google Scholar, Medline (OVID), Medline in Process (OVID), Scopus, www.Africabib.org, African Index Medicus; http://indexmedicus.afro.who.int/, and African Journals Online (AJOL) https://www.ajol.info/ in April 2017. The databases were chosen to provide good coverage of the African healthcare literature by including both the major global and Africa-specific resources. Complete search strategies, including combinations of text words (from title/abstract) and indexer-provided subject headings (where available), are listed in **Appendix 1**.

Supplementary searching was also employed: reference lists of included studies were checked for additional studies; citation tracking was used to identify more recent publications; authors of included publications were contacted to ask

about unpublished and in-press studies.

2.3. Inclusion and Exclusion Criteria

To assure modern-day relevance, this study was limited to literature published from January 2000 to April 2017, when searches were completed. As this review aimed at identifying and analysing the information sources consulted by menopausal women in the Africa region, only studies that incorporated women from the African region were included. Pre-, peri-, menopause-, and post-menopausal women between ages 35 - 90 were included in this review. Complete inclusion and exclusion criteria are described in Table 1.

2.4. Data Selection

The results of all database searches were imported into Reference Manager 12 http://www.adeptscience.co.uk/products/refman/reference and duplicates removed. Records potentially meeting the inclusion criteria were screened by two researchers, independently, first at title/abstract stage then at full text stage. Additional studies obtained from cross referencing and reviews met the inclusion criteria and were included in the full text review. Data were then independently coded by two researchers based on the sources of information used by the menopausal women.

2.4.1. Quality Assessment

Two researchers firstly independently reviewed different appraisal tools and then agreed on the Center for Evidence-Based Management (CEBMa) critical appraisal tools, designed for qualitative and cross-sectional studies (https://www.cebma.org/resources-and-tools/what-is-critical-appraisal). The CEBMa critical appraisal tools have 10 (qualitative) and 12 (quantitative) yes/no questions depending on the type of study to help guide the assessment of the quality of the literature being critiqued. Quantitative studies were critiqued,

Table 1. Inclusion and exclusion criteria for the review.

Population	**Menopausal women** in Africa. These were all women who were experiencing amenorrhoea for 12 consecutive months and above without biological or physiological cause. **Pre-menopause:** Refers to the stage that leads up to peri-menopause. This stage affects most women in their late thirties and early forties. **Peri-menopause:** Peri-menopause is the stage that occurs before menopause. During this stage, the menstrual period becomes irregular, which signifies the end of fertility in woman's life, coupled by some troublesome symptoms. **Post-menopause:** Refers to the time after a woman's menstrual periods have ceased for 12 consecutive months. During postmenopausal stage, many troublesome symptoms a woman may have experienced during peri- menopause gradually decrease.
Exploration	Use of information sources to understand and manage signs and symptoms. [Information refers to knowledge communicated or received concerning a particular fact or circumstances]
Outcomes	1) Hot flashes 2) Sexual function 3) All other menopause related signs and symptoms
Limits	1) Include publications since 2000 published in the African region 2) Exclude papers that discuss a lack of knowledge/information in general but with no description of information sources used.

based on the following criteria: focused question, study design, selection of participants, selection bias, representativeness, sample size by power calculation, response rate, question reliability, statistical significance, confidence intervals, confounders, relevance to African population, while qualitative studies were critiqued on: focused question, study design, study context, fieldwork, evidence inspected, procedure reliability, analysis reliability, results credibility, conclusions justified, findings transferable. (See comments in Table 2) Thereafter, eligible studies (14) were independently appraised by two researchers. The researchers had one Skype call and one in-person meeting and discussed appraised articles. Two disagreements in the scores were discussed until consensus was reached.

2.4.2. Data Extraction

Tables were used to extract author name, year of publication, country of origin, aim of study, study design, sample characteristics, data collection instruments and data collection procedure, results and limitations identified via the quality assessment process, as shown in Table 3.

2.5. Analysis

Prevalence information was pooled with random effects meta-analysis where appropriate. Results are presented with the associated fixed effect estimates and 95% confidence interval as well as the i-square statistic. All analysis was conducted using the R programming language and environment implementing the meta and metafor packages [21] [22] [23].

3. Results

Our initial search yielded 794 studies (Figure 1). Twelve additional studies were

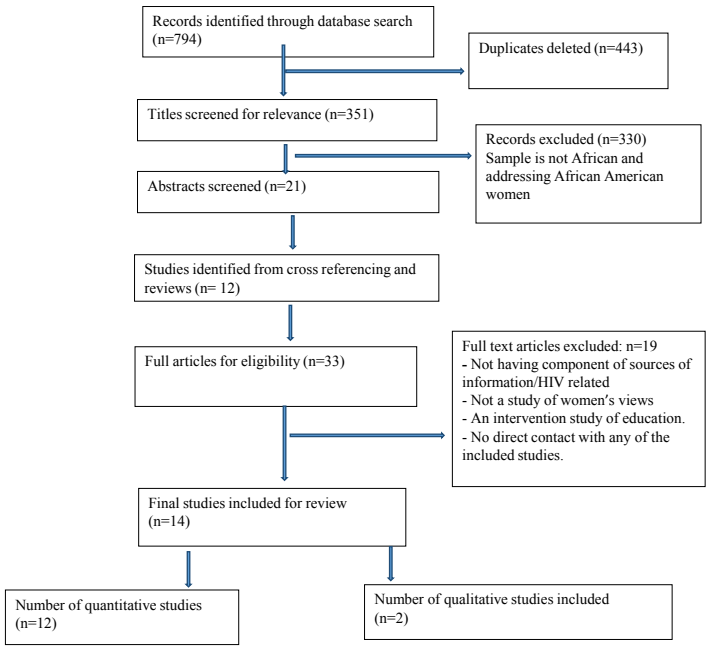

Figure 1. Flow diagram of reviewed studies.

identified from cross referencing and reviews. After 443 duplicates were deleted from the initial search, the remaining 351 studies together with the twelve records through other sources were then imported into Reference Manager 12. Three hundred and thirty (330) studies were excluded because they were conducted primarily among African American menopausal women in America. The 21 full text review records plus the twelve additional records were retained. Thirty three full-text articles were assessed for eligibility (**Appendix 2**), and 19 records excluded, with reasons including: not providing sources of information, HIV related, not a study of women's views, or an educational interventional study. The eligibility criteria were then reapplied to the remaining 14 full texts for thematic synthesis to illustrate the key information sources, used by menopausal women in the African region. Of the 14 reviewed studies, 12 employed quantitative and 2 qualitative approaches. Resultant studies are summarised in Table 2.

3.1. Reporting

The majority of the studies (12) employed a quantitative cross-sectional design: two (2) studies were qualitative in nature. The information from the cross-sectional studies was collected with structured questionnaires, using close and open ended questions, while interviews were used for qualitative studies. Response rates were between 75-100%. The fourteen eligible studies reporting on the information sources used by menopausal women in the African region were from Nigeria (7), South Africa (3), Ethiopia (2), Namibia (1) and Ghana (1). Meta-analysis was conducted to pool the prevalence of six different information sources: friends, relatives, medical providers, books/magazines/journals, TV/radio and religious sources.

Friends were the most frequently reported source of menopause information with a point prevalence estimate of 0.44 (95% CI: [0.35, 0.54], number of studies = 7), followed by relatives with a point prevalence estimate of 0.35 (95% CI: [0.22, 0.50], number of studies = 5). Medical providers were next, prevalence 0.30 (95% CI: [0.15, 0.50], number of studies = 9), followed by TV and radio, prevalence 0.20 (95% CI: [0.06, 0.48] number of studies = 5), then books, magazines, journals prevalence 0.19 (95% CI: [0.10, 0.33], number of studies = 9), with religious sources being the lowest, prevalence 0.06 (95% CI: [0.02, 0.14], number of studies = 5). It must be noted however that all of the above analyses exhibited high levels of heterogeneity (i^2 all above 94%).

3.2. Quality Assessment

Fourteen studies were appraised. Each of the critiqued studies had 10 - 12 components needed to constitute a strong study, out of 10 - 12 possible criteria (see Table 2). According to the results of the critical appraisals, studies were overall of good quality. Survey instruments were rarely piloted or validated however, and studies did not generally assess statistical significance intervals because these studies were mostly addressing perceptions, attitudes and or behaviour of the

Table 2. Summary of quality assessment based on CEBMa tools.

(a)

Summary of appraised quantitative papers (n = 12)	Number of studies meeting this criteria n = 12 total studies (%)
Clearly described:	
Focused question:	12 (100)
Study design	12 (100)
Selection described:	10 (83%)
Low risk of selection bias Low risk: 8 papers	8 (67%)
Representative of group indicated: 6 papers	6 (50%)
Appropriate sample size by Power Statistical Power indicated: 2 papers	2 (17%)
Response rate ≥ 70% More than 70%: 6 papers	6 (50%)
Reliable measurement Reliable:8 papers	8 (67%)
Statistical significance Not assessed in all (12) papers	0
Confidence intervals Not provided: in all 12 papers	0
No other confounders Confounders not obvious in all 12 papers	12 (100%)
Relevance to African population Relevant: 9 papers	9 (75%)

(b)

Summary of appraised qualitative papers (n = 2)	Number of studies meeting this criteria n = 10 total studies (%)
Clearly described:	
Focused question:	2 (100%)
Study design	2 (100%)
Study context	2 (100%)
Fieldwork	1 (50%)
Evidence inspected	1 (50%)
Procedure reliability	2 (100%)
Analysis reliability	0
Results credibility	2 (100%)
Conclusions justified	2 (100%)
Findings transferable.	0

African menopausal women.

4. Discussion

This review synthesised the data regarding information sources consulted by

Table 3. Included studies and data extraction.

Study details	Population & setting	Methods	Results: Information sources consulted	Limitations
First author and year: Anolue, 2012 **Study design:** Quantitative - Questionnaire **Objective:** To document women's experience of menopause in rural communities and compare this with urban centres	**Setting:** Nigeria **Participants:** N = 349. Mean age 58 years **How recruited:** Random selection from 13 autonomous rural communities **When:** August 2009 **Inclusion criteria:** Menopausal women with at least 12 months amenorrhoea. All participants from a certain ethnic group	**Tools and data collection:** Questionnaire **Analysis:** SPSS software. Chi-square test	Peers = 51.3% Parents = 28.9% Others = 12.0% Church group = 7.7%	Total population from where the sample was drawn not indicated Tools not validated Design not indicated No exclusion criteria Missing data (p.32) not accounted for
First author and year: Bello, 2016 **Study design:** Quantitative - Questionnaire **Objective:** To determine level of awareness and perceptions about menopause and sex in peri-menopausal women	**Setting:** Nigeria, Family Medicine Department in Ibadan hospital **Participants:** N = 352. Aged ≥ 40 years (mean 46.3). **How recruited:** Not described **When:** Not stated **Inclusion criteria:** Peri-menopausal women. Menopausal and post-menopausal women (12 months or more amenorrhoea) excluded	**Tools and data collection:** Structured questionnaire **Analysis:** SPSS software. Chi-square test	Friends & Peers = 45.7% Health care providers = 17.0% Aunts & older sisters = 15.1% Doctors = 13.6% TV/Radio = 12.2% Books & other print media = 12.2% Others = 1.4%	Data collection tools not subjected to validity and reliability test Data collection period not indicated Selection method not indicated Total population not described
First author and year: Dienye, 2013 **Study design:** Quantitative - Questionnaire **Objective:** To determine frequency & severity of menopausal symptoms and health seeking behavior of women with menopausal symptoms	**Setting:** Nigeria, Port Harcourt Teaching Hospital **Participants:** N = 385. Aged 35-95 years (mean 58.4) **How recruited:** Consecutive recruitment at clinic until pre-specified sample size reached **When:** July-September 2010 **Inclusion criteria:** Postmenopausal women with at least 12 months amenorrhoea	**Tools and data collection:** Questionnaire results recorded in Microsoft Office Excel **Analysis:** Epi Info software	Patent drug dealers = 51.4% Health workers = 44.7% Nothing = 26.5% Religious leaders = 20.3% Traditional healers = 3.8%	Validity of tools not measured Missing data was not accounted for
First author and year: Eshetu, 2015 **Study design:** Quantitative - Questionnaire **Objective:** To assess level of knowledge and attitude of women aged 30 - 49 yrs	**Setting:** Ethiopia, Addis Ababa **Participants:** N = 599 (586 correctly completed). Aged 30 - 49 years (mean 37) **How recruited:** Multi-stage random sampling from community until pre-specified sample size reached **When:** April-May 2015 **Inclusion criteria:** Age, permanent residency, consent	**Tools and data collection:** Questionnaire **Analysis:** SPSS software. Logistic regression.	Friend = 37.7% Relatives = 31.7% Medical care providers = 20.8% Books, Magazines, Journals = 14.8% Mass media (Radio, TV) = 14.7% Educational sessions = 7.0% Community Elder = 1.4%	Validity of tools not indicated

Continued

First author and year: Hofnie-//Hoëbes, 2009 **Study design:** Mixed methods - Quantitative (questionnaire) and qualitative (open ended interviews) **Objective:** To determine where and what information is available regarding menopause and from where it is obtained	**Setting:** Namibia, urban and rural locations **Participants:** N = 1079 **How recruited:** Multi-stage cluster sampling from community **When:** March-April 2008 **Inclusion criteria:** Pre-menopausal, peri-menopausal and menopausal women	**Tools and data collection:** Questionnaire and open-ended interviews with a guide **Analysis:** SPSS software. Pearson chi-square test. Descriptive documentation of focus group discussion	Significant others = 55% Health care workers = 12% Other = 14% Books = 13% TV = 3% Church = 2% Internet = 1%	Validity and reliability of tools not clear
First author and year: Ibraheem, 2015 **Study design:** Mixed methods - Quantitative (questionnaire) and qualitative (focus groups) **Objective:** To determine menopausal experiences and perceptions of women	**Setting:** Nigeria **Participants:** N = 240. Aged 46 - 69 years (mean 56.9) **How recruited:** Multi-stage random sampling from list of local government areas **When:** April 2008 **Inclusion criteria:** Age, amenorrhoea for 12 months & above, member of community & voluntary verbal consent	**Tools and data collection:** Piloted guide for focus group discussions with results informing semi-structured questionnaires. Cronbach's Alpha for instrument 0.745 **Analysis:** Chi-square and descriptive for quantitative data. Content analysis for focus groups.	Mother, sister, aunt or friend = 58.8% Electronic & print media = 8.9% Health care provider = 4.9% Religious leaders = 3.0%	No exclusion criteria
First author and year: Ikeme, 2011 **Study design:** Quantitative - Questionnaire **Objective:** To determine knowledge and perceptions of menopause and climacteric symptoms	**Setting:** Nigeria **Participants:** N = 432. Aged 45 - 60 **How recruited:** Random selection **When:** Not stated **Inclusion criteria:** Not described	**Tools and data collection:** Self-administered structured questionnaire **Analysis:** SPSS software. Descriptive statistics with cross tabulations.	No comment = 44.4% Gynaecology clinic = 22.2% Self prayers = 13.9% Medical clinic in hospital = 11.1% Native doctor = 2.8% Clinic and priest and self prayer = 2.8% Medical clinic and priest = 2.8%	Menopausal status not indicated Data collection tools not subjected to validity and reliability test Data collection period not indicated Total population not described Cross-tabs indicated in methods, but not seen in data analysis
First author and year: Maharaj, 2007 **Study design:** Quantitative - Questionnaire **Objective:** To assess whether women in an under-resourced country have adequate knowledge of the menopause/HRT to engage in patient-provider discussions and utilised in full informed consent for HRT	**Setting:** South Africa, Durban **Participants:** N = 150 (complete data and included = 139). Aged 18 - 40 years (mean 31) **How recruited:** Not stated **When:** Not stated **Inclusion criteria:** Past and present users of HRT aged ≥ 40 years.	**Tools and data collection:** Questionnaire **Analysis:** ANOVA chi-square	Family = 52.5% Friends = 44.6% Media = 41.7% GPs = 14.4% Clinic: 11.5% Hospital = 9.4%	Sample not proportional Design not indicated Aim too broad Tools not subjected to reliability test Initial inclusion of teenagers was inadequate

Continued

First author and year: Odiari, 2012 **Study design:** Qualitative - Interviews **Objective:** To investigate how women in low resource setting manage menopausal symptoms without HRT	**Setting:** Ghana, Accra regional hospital **Participants:** N = 34 (meeting criteria from 82 considered). Mean age 58 years **How recruited:** Purposive sampling from clinic with random approach for inclusion **When:** Not stated **Inclusion criteria:** Had experienced natural menopause. No history of cardiac disease or arthritis before menopause. Conversant in English or Ghanaian languages	**Tools and data collection:** Semi-structured interview guide. Data collection suspended when data saturation was reached **Analysis:** NVivo 8 software. Chi-square test. Content analysis.	People who previously experienced menopause (Friends, colleagues or family) = 55.9% Health care providers/media/books/ church meetings = 44.1%	No exclusion criteria Random sampling process unclear Not clear whether two researchers were involved in data analysis
First author and year: Osinovo, 2003 **Study design:** Quantitative - Questionnaire **Objective:** To investigate factors associated with attitude towards sex-role, self-image & marital satisfaction on psychological health status, perception of menopause and sexual satisfaction	**Setting:** Nigeria, Urban **Participants:** N = 45. Aged 36 - 70 years (mean 51.4) **How recruited:** Purposive sampling from women attending a seminar on aging **When:** Not stated **Inclusion criteria:** Non-menopausal and menopausal	**Tools and data collection:** Piloted questionnaire **Analysis:** SPSS software. Coefficient alpha: 0.94. Descriptive stats	Not stated = 36% Health institutions: = 22% Books = 11% Doctors = 7% Books/Health workers = 7% Friends = 4% Books/friends/relatives = 4% Books/Friends/Doctors = 4% Professional experience = 2% Sex education = 2%	Not clear how many questionnaires were distributed in total
First author and year: Ramakeula, 2015 **Study design:** Qualitative - Focus groups **Objective:** To explore and describe women, menopause and aging in rural villages	**Setting:** South Africa, rural **Participants:** N = 24 to 32 (not specified). Aged 45 and over. **How recruited:** Purposive sampling in four villages **When:** Not stated **Inclusion criteria:** Pre-, peri- and post-menopausal women	**Tools and data collection:** Four focus groups (6 - 8 women per group) **Analysis:** Tesch's open coding. Clustered into themes and sub-themes.	Informed by nurse at a church conference	Data collection period not indicated Not indicated if two researchers were involved in data analysis
First author and year: Saka, 2011 **Study design:** Quantitative - Questionnaire **Objective:** To assess the perceived cause, expectation, knowledge and sources of health information, women's knowledge and adjustment behaviour towards menopause.	**Setting:** Nigeria, Ilorin **Participants:** N = 400 (396 providing information on sources used). Aged 40 years and over **How recruited:** Multi-stage random sampling **When:** Not stated **Inclusion criteria:** Menopausal women with 12 months amenorrhoea	**Tools and data collection:** Semi-structured questionnaire translated from English to other languages as required **Analysis:** EpiInfo software. Means and frequencies. Chi-square test.	Friends = 38.6% Relatives = 28.0% Group meeting & religious home = 12.6% Health workers = 9.6% Books/news papers/magazines/mass media = 7.1% Others = 4.0%	Data collection period not indicated Validity and reliability of tools not indicated

Continued

First author and year: Smith, 2009 **Study design:** Quantitative - Questionnaire **Objective:** To evaluate current patient perspectives on the menopausal period in South Africa	**Setting:** South Africa, private specialist practice in Tygerberg **Participants:** N = 410 (541 distributed, 421 returned, 410 used). Aged 37 - 88 years (mean 59.9) **How recruited:** Purposive sampling **When:** Jan-July 2003 **Inclusion criteria:** All known patients with established post-menopausal status using hormone therapy	**Tools and data collection:** Postal questionnaire **Analysis:** SPSS software. Means (standard deviations)	Gynaecologists = 87.2% GPs = 28.3% Print & electronic media = 38.3%	Data collection tools not subjected to validity and reliability test Single private practice included but total population of private practices unknown
First author and year: Tsehay, 2014 **Study design:** Quantitative - Questionnaire **Objective:** To examine middle aged women's experience and attitudes towards menopausal symptoms	**Setting:** Ethiopia, Danglia Town **Participants:** N = 263 pre- and post-menopausal women. 35 - 70 years (mean 46.7) **How recruited:** Purposive random sampling. **When:** Not stated **Inclusion criteria:** Women's menstrual status	**Tools and data collection:** 1) Semi -Structured questionnaires 2) Piloted 3) Interviews 4) Questionnaires assessed by experts for content & Cronbach's Alpha: = 0.87 for symptoms and 0.79 for attitudes **Analysis:** SPSS software. *P* value = 0.05	Friends = 70.8% Medical care providers = 68.8% Books, magazines, journals = 66.7% Relatives = 56.3% Educational sessions = 43.8% Community Elders = 22.9%	Data collection period not indicated Ethical considerations not indicated

menopausal women in the African region. The available literature was of high quality, despite the heterogeneity of the methodologies and sample characteristics and assessment tools.

Based on the findings and consistent with previous reports [24], African menopausal women are more likely to learn about the menopause from their friends and relatives, rather than from professional assistance. Religious sources were the lowest of all that were consulted by women in the African region about the menopause.

The meta-analyses revealed high heterogeneity indicating that it is unlikely that the studies were all measuring the same quantities in exactly the same way. This is perhaps unsurprising given the wide geographical area covered by this study, encompassing many different cultures. The results must therefore be interpreted carefully.

Although women experience menopause in a universal manner due to decline in ovarian function leading to different menopausal symptoms, the actual experiences of the most common symptoms such as hot flushes, night sweats and low libido are individual [6] [13] [14] [25] [26]. Menopausal women may also experience challenges such as: anxiety, poor-self-image, low self-esteem, sleep-

lessness, panic [4], due to the multidimensional nature of menopause, which is influenced by biological, psychological, social and cultural dimensions [5]. Therefore, lack of professional awareness may contribute to silent suffering of menopausal women [2] [4]. This is particularly true in the majority of African states where discussion of reproductive health issues are considered taboo, private and sensitive and therefore not easily shared amongst others [25] [27].

It is equally desirable that women have access to information on the menopause from health care providers regarding current treatment options [28] [29] [30] and associated risks and benefits of menopause. Medical professionals are best placed to provide menopausal women with individualised care to improve quality of life. Regarding some common menopausal symptoms, such as reduced sexual functioning, health care workers should advise women that pharmacological and non-pharmacological therapies are available to treat atrophic vaginitis and relieve pain during intercourse [28]. With over three quarters of women not citing medical professionals as an information source there is clearly room for improvement.

Given how many women access menopause information through friends and relatives, it may be helpful for health care providers to design special programmes to inform them about menopause; as partners or family members, men also may benefit from education as they experience menopausal symptoms alongside these women without prior knowledge or understanding. Such awareness will help family and friends to be sensitive to menopausal women during this period and provide adequate support [31]. The public health systems should also mobilise adequate resources to improve the awareness and knowledge of the women about menopause and menopausal symptoms to promote active and healthy living during the period of menopause [32]. Moreover, clinical research regarding menopause and understanding of menopausal symptoms should be done in the African region to guide public health policy and education.

5. Limitations

Although a comprehensive search was undertaken, we cannot guarantee that all relevant research studies were identified. All the papers that discussed lack of knowledge/information in general but with no description of information sources were excluded. These criteria might have limited the scope of available literature on the information sources in the African region.

6. Conclusion

Women in African countries experiencing menopause are more likely to have gained information about their condition from friends and relatives than from health professionals. Consequently, while relatives and friends might support them during this uncertain period, there is a clear opportunity for medical professionals to play a greater role in the education of women experiencing the menopause.

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Ethical Approval

As this was a review of existing literature, no ethical approval was required.

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Annexures

Appendix 1: Search Strategies

PubMed 7 April 2017 259 hits

Search strategy:

Menopaus*: *as a text word (ie word in title or abstract)*

OR Menopause: *as a MeSH term (including all more narrow terms).*

AND

(Information OR experience* OR perception* OR health seeking behave* OR knowledge): *as a text word*

OR Information Seeking Behaviour: *as a MeSH term (there are no more narrow terms).*

AND

(Africa* OR Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR Cameroon OR "Canary Islands" OR "Cape Verde" OR "Central African Republic" OR Chad OR Comoros OR Congo OR "Democratic Republic of Congo" OR Djibouti OR Egypt OR "Equatorial Guinea" OR Eritrea OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR "Guinea Bissau" OR "Ivory Coast" OR "Cote d'Ivoire" OR Jamahiriya OR Jamahiryia OR Kenya OR Lesotho OR Liberia OR Libya OR Libia OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mayote OR Morocco OR Mozambique OR Mocambique OR Namibia OR Niger OR Nigeria OR Principe OR Reunion OR Rwanda OR "Sao Tome" OR Senegal OR Seychelles OR "Sierra Leone" OR Somalia OR "South Africa" OR "St Helena" OR Sudan OR Swaziland OR Tanzania OR Togo OR Tunisia OR Uganda OR "Western Sahara" OR Zaire OR Zambia OR Zimbabwe OR "Central Africa" OR "Central African" OR "West Africa" OR "West African" OR "Western Africa" OR "Western African" OR "East Africa" OR "East African" OR "Eastern Africa" OR "Eastern African" OR "North Africa" OR "North African" OR "Northern Africa" OR "Northern African" OR "South African" OR "Southern Africa" OR "Southern African" OR "sub Saharan Africa" OR "sub Saharan African" OR "subSaharan Africa" OR "subSaharan African"): *as text words*

OR Africa: *as a MeSH term (there are no more narrow terms)*

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BioMed Central 19 April 2017 85 hits.

Menopause AND information seeking AND (South Africa* OR Namibia*)

As text words

Sorted by "relevance" and browsed for studies since 2000. No relevant studies.

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Continent specific databases: 7 April 2017.Search strategy: Search for menopaus* in the title. One additional hit, not identified in other databases (Saka 2011)

https://www.africabib.org/

African Index Medicus; http://indexmedicus.afro.who.int/
African Journals Online (AJOL) https://www.ajol.info/

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Embase 19 April 2017 250 hits.
Database(s): EMBASE 1947-Present [OVID]
Search Strategy:
Key to terms used:
/ = indexer-provided subject heading
kw = author keyword
tw = word in the title or abstract

#	Searches	Results
1	exp menopause/	52840
2	menopaus*.kw.	12359
3	1 or 2	56656
4	information seeking/	2204
5	(Information or experience* or perception* or health seeking behave* or knowledge).tw.	3048848
6	4 or 5	3049217
7	exp Africa/	305611
8	(Africa* or Algeria or Angola or Benin or Botswana or Burkina Faso or Burundi or Cameroon or Canary Islands or Cape Verde or Central African Republic or Chad or Comoros or Congo or Djibouti or Egypt or Equatorial Guinea or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or Guinea Bissau or Ivory Coast or Jamahiriya or Kenya or Lesotho or Liberia or Libya or Libia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mayote or Morocco or Mozambique or Mocambique or Namibia or Niger or Nigeria or Principe or Reunion or Rwanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or South Africa or St Helena or Sudan or Swaziland or Tanzania or Togo or Tunisia or Uganda or Western Sahara or Zaire or Zambia or Zimbabwe or Central Africa or Central African or West Africa or West African or Western Africa or Western African or East Africa or East African or Eastern Africa or Eastern African or North Africa or North African or Northern Africa or Northern African or South African or Southern Africa or Southern African or Saharan Africa or Saharan African).tw.	538280
9	7 or 8	606590
10	3 and 6 and 9	272
11	limit 10 to yr = "2000-2017"	250

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Google Scholar 19 April 2017 *Terms in search box*

Menopaus* information seeking Africa*
OR
Menopaus* Namibia*
Limited to 2000 to 2017. Then browsed through each set of results until clearly irrelevant ~ 15 pages. 3 potentially relevant studies identified.

Medline and Medline in Process 19 April 2017 143 hits

Database(s): Ovid MEDLINE(R) without Revisions 1996 to April Week 1 2017, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations April 18, 2017
Search Strategy:
Key to terms used:
/ =indexer-provided subject heading
kw = author keyword
tw = word in the title or abstract

#	Searches	Results
1	exp menopause/	35116
2	menopaus*.kw.	1607
3	1 or 2	36017
4	information seeking behavior/	1335
5	(Information or experience* or perception* or health seeking behave* or knowledge).tw.	1804883
6	4 or 5	1805096
7	exp Africa/	142816
8	(Africa* or Algeria or Angola or Benin or Botswana or Burkina Faso or Burundi or Cameroon or Canary Islands or Cape Verde or Central African Republic or Chad or Comoros or Congo or Djibouti or Egypt or Equatorial Guinea or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or Guinea Bissau or Ivory Coast or Jamahiriya or Kenya or Lesotho or Liberia or Libya or Libia or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mayote or Morocco or Mozambique or Mocambique or Namibia or Niger or Nigeria or Principe or Reunion or Rwanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or South Africa or St Helena or Sudan or Swaziland or Tanzania or Togo or Tunisia or Uganda or Western Sahara or Zaire or Zambia or Zimbabwe or Central Africa or Central African or West Africa or West African or Western Africa or Western African or East Africa or East African or Eastern Africa or Eastern African or North Africa or North African or Northern Africa or Northern African or South African or Southern Africa or Southern African or Saharan Africa or Saharan African).tw.	269200
9	7 or 8	302023
10	3 and 6 and 9	156
11	limit 10 to yr = "2000-2017"	143

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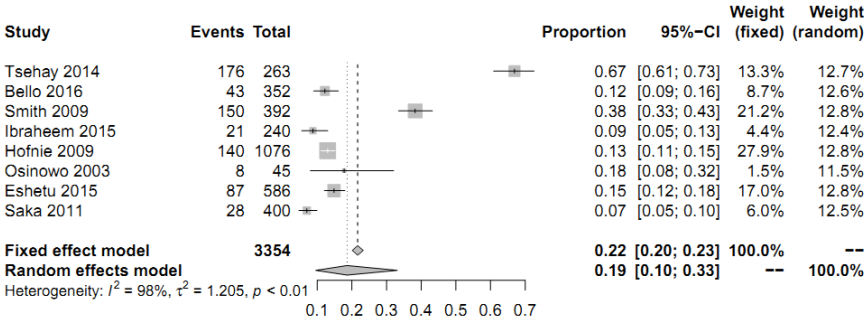
Scopus 19 April 2017 54 hits.
(TITLE-ABS-KEY (menopaus*)) AND (TITLE-ABS-KEY (information OR experience* OR perception* OR health AND seeking AND behave* OR knowledge))

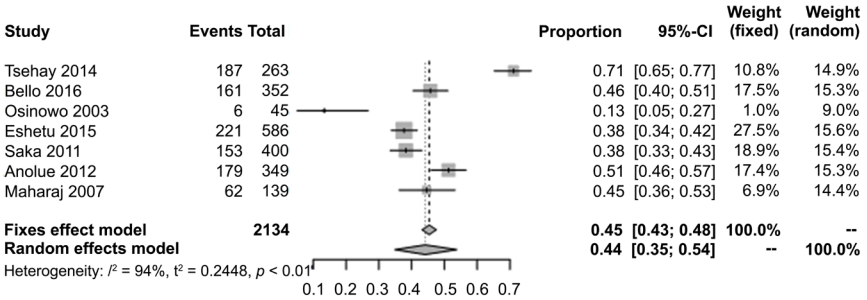
Appendix 2: PRISMA 2009 CHECKLIST

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	0
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	1 and 3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	3
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	3 - 4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	4
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4 - 5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4 - 5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	2 and 15; **Table 1**
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4 - 5 and 16; **Table 2**
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	5
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	5 - 6

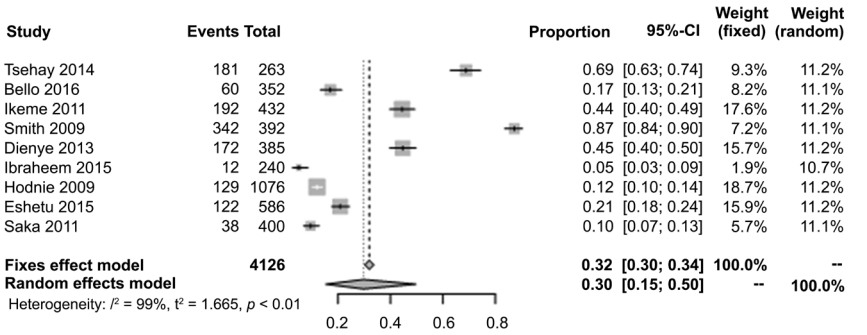
Books, magazines, journals



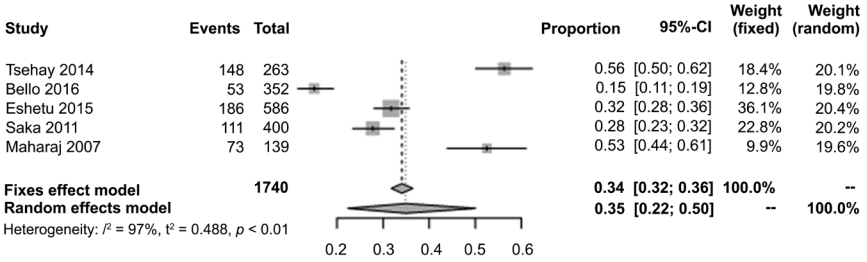
Friends

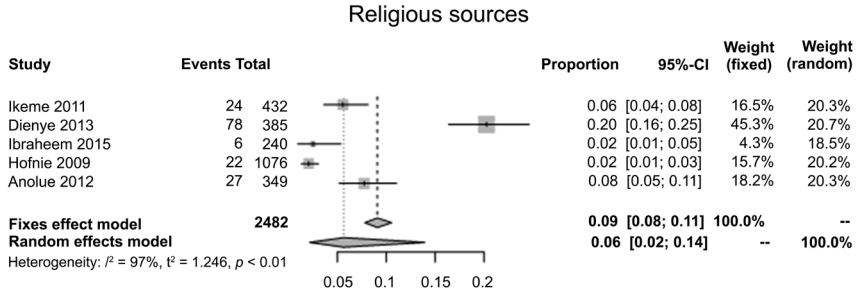


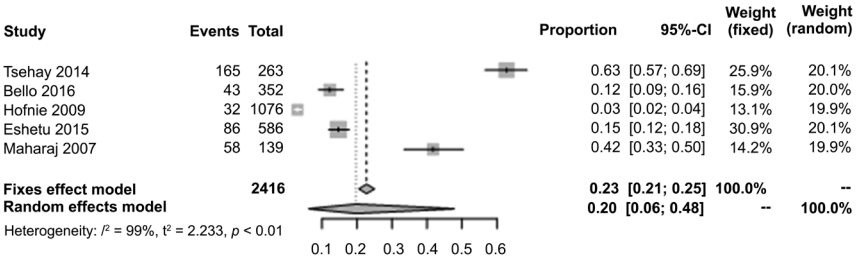
Medical providers



Relatives




Religious sources
Study
Events Total
Proportion
95%-CI
Weight (fixed)
Weight (random)
Ikeme 2011 24 432 0.06 [0.04; 0.08] 16.5% 20.3%
Dienye 2013 78 385 0.20 [0.16; 0.25] 45.3% 20.7%
Ibraheem 2015 6 240 0.02 [0.01; 0.05] 4.3% 18.5%
Hofnie 2009 22 1076 0.02 [0.01; 0.03] 15.7% 20.2%
Anolue 2012 27 349 0.08 [0.05; 0.11] 18.2% 20.3%
Fixes effect model 2482 0.09 [0.08; 0.11] 100.0% --
Random effects model 0.06 [0.02; 0.14] -- 100.0%
Heterogeneity: I^2 = 97%, t^2 = 1.246, p < 0.01
0.05 0.1 0.15 0.2


Tv and Radio
Study
Events Total
Proportion
95%-CI
Weight (fixed)
Weight (random)
Tsehay 2014 165 263 0.63 [0.57; 0.69] 25.9% 20.1%
Bello 2016 43 352 0.12 [0.09; 0.16] 15.9% 20.0%
Hofnie 2009 32 1076 0.03 [0.02; 0.04] 13.1% 19.9%
Eshetu 2015 86 586 0.15 [0.12; 0.18] 30.9% 20.1%
Maharaj 2007 58 139 0.42 [0.33; 0.50] 14.2% 19.9%
Fixes effect model 2416 0.23 [0.21; 0.25] 100.0% --
Random effects model 0.20 [0.06; 0.48] -- 100.0%
Heterogeneity: I^2 = 99%, t^2 = 2.233, p < 0.01
0.1 0.2 0.3 0.4 0.5 0.6