Traditional and religious healers in the pathway to care for people with mental disorders in Africa: a systematic review and meta-analysis

Jonathan K. Burns and
Department of Psychiatry, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban, South Africa

Andrew Tomita
Department of Psychiatry, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban, South Africa. Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, USA

Jonathan K. Burns: burns@ukzn.ac.za

Abstract

Purpose—In resource-limited contexts in low- and middle-income countries (LMICs), a considerable proportion of individuals seeking care for mental disorders consult traditional and religious healers in their pathway to mental health care. Reports from Africa suggest that early involvement of healers may result in delays in the care pathway; a potential barrier to early identification and intervention.

Methods—A systematic review was conducted to evaluate the proportion of patients attending formal health services after making first contact for treatment of mental disorders with traditional or religious healers or other informal and formal care providers within published research in Africa. Electronic databases were searched for the period from January 1990 to February 2014. Quality assessment of included studies was conducted the SAQOR tool.

Results—Fourteen papers were identified with data on category of first care provider. Utilizing random effects modelling with inverse variance method, the pooled proportion of participants making first contact for treatment of mental disorders with two broadly categorised providers (informal and formal) was 48.1 % (95 % CI 36.4–60.0 %) and 49.2 % (95 % CI 38.0–60.4 %), respectively. The pooled proportion of participants making first contact with specific providers was: traditional healers (17.0 %, 95 % CI 10.9–24.1 %); religious healers (26.2 %, 95 % CI 18.1–35.1 %); general health services (24.3 %, 95 % CI 16.9–32.5 %); and mental health services (13.0 %, 95 % CI 5.1–23.5 %). Substantial regional variation in patterns of first provider choice was evident.

Correspondence to: Jonathan K. Burns, burns@ukzn.ac.za.

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Conclusions—Conclusions of this review must be qualified in the light of several limitations. Approximately half of individuals seeking formal health care for mental disorders in Africa, choose traditional and religious healers as their first care provider. Previous reports suggest that this choice is associated with delays in accessing formal mental health services. Strategies to improve pathways to mental health care in Africa must include innovative programmes aimed at fostering collaboration between biomedical mental health services and these key community-based providers.

Keywords

Traditional healers; Pathway to care; Mental disorders; Africa; Treatment delay

Introduction

A major contributory factor to poor outcome in people with mental disorders is delayed presentation for care and treatment. In the case of first-episode psychosis, delays are associated with a greater proportion of negative symptoms, poorer response to treatment, and a higher relapse rate [1, 2]. A core strategy in attempting to prevent the long-term morbidity associated with mental disorders is therefore early detection, identification and intervention. Thus elucidating pathways to care and the potential barriers that delay access to early interventions is a priority, particularly within contexts characterised by limited mental health resources [3, 4].

There is good evidence for a considerable mental health treatment gap in low- and middle-income countries (LMICs) due to a lack of adequate infrastructure, human resources and treatment options [5]. This is nowhere more apparent than on the African continent, where data from the World Health Organization's Atlas Project on mental health shows "widespread, systematic and long-term neglect of resources for mental health care in low income and middle-income countries" [6]. Within Africa, there is a gross inadequacy of beds for those requiring hospitalisation for mental illness, with an average of 0.34 beds per 10,000 population, 73 % of which are in psychiatric hospitals [7]. Similarly, there are major inequities between high-income countries (HICs) and LMICs in terms of trained mental health professionals; the average number of psychiatrists in Europe being 9 per 100,000 population compared to 0.05 per 100,000 population in Africa [7, 8].

Within this context, people seeking help for mental disorders in LMICs rely heavily on alternative or informal sources of care. There is good evidence that in these countries, a considerable proportion of individuals seek help from traditional and religious healers for a range of health problems, including mental disorders [9–11]. Critics argue that the proportion commonly quoted in the literature of 80 % of the population [12, 13] may be greatly exaggerated [14]. While studies show that satisfaction with care administered by healers is high in many cases for individuals with mental disorders [15, 16], the evidence indicates that delays in accessing formal mental health services are common where they feature in the pathway to care [17, 18].

It is clear that understanding pathways to care for those with mental disorders within Africa, requires clarification of the extent to which informal practitioners feature early in the care

pathway as it is likely that the choice of initial provider contributes to potential delays in accessing mental health care. In this paper we conduct a systematic review of the literature aimed at answering the following question: Within published research in Africa, what proportion of individuals presenting for care at mental health services attended traditional and religious healers as their *initial* step in the help-seeking pathway to care?

Method

Search strategies

The following electronic databases were searched: Pub-Med/Medline, EBSCO, PsychINFO, AJOL (African Journals Online), and SABINET. The search string used was: "(healer OR pathway OR services OR first contact OR help seeking) AND (mental OR psychiatric OR psychotic OR schizophrenia OR depression OR mood disorder OR anxiety disorder)." The electronic databases were searched for titles or abstracts containing these terms in all published articles between January 1990 and February 2014 inclusive. Only studies published in English were included. The reference lists of all included studies were hand-searched for additional relevant reports or key terms. If new key terms were identified (new terms included: "diviner"; "herbalist"; "psychopathology"; "mania"; "bipolar") additional searches of the above databases were conducted and relevant papers were added until no further publications were found.

Inclusion and exclusion criteria

As the focus of this review was on research conducted in Africa, only papers reporting data from African countries were included. All studies meeting all of the following criteria were included: (1) those providing quantitative data on a treatment seeking population for mental disorder; (2) those reporting category of first-contact provider; (3) those using appropriate designs and methods to document pathways to care (specifically first-contact provider). Exclusion criteria were: (1) studies not reporting on help-seeking populations for a mental disorder; (2) unpublished data of any form including conference proceedings, case reports, dissertations, qualitative studies, and publications reporting duplicate data from the same population.

Data extraction and quality assessment of included studies

Study data were extracted onto a customised data-extraction sheet. Quality assessments were independently performed by two investigators using the Systematic Appraisal of Quality in Observational Research (SAQOR) tool that comprises six domains (each containing two to five questions): sample; control/comparison group; exposure/outcome measurements; follow-up; confounders; and reporting of data [19]. In the current study, two domains were omitted (control/comparison group; and follow-up) as they were not applicable to any of the papers identified. By consensus between the two investigators, a summary quality assessment was thus made for each of four domains and then an overall summary grade was determined based on adequacy in the four domains. The overall quality of the study was graded as: high; moderate; low; or very low.

Data synthesis and analysis

The pooled estimates of the proportion of participants making first contact for treatment of mental disorders with two broadly categorised providers (informal and formal) were calculated using random effects modelling with inverse variance method. The category, 'informal', included traditional and religious healers; while the category 'formal' included all health services, including general and psychiatric hospitals, clinics, pharmacists and social workers. The results of the meta-analyses are presented in forest plot format. Secondly, study heterogeneity was examined using both the Cochran χ^2 and I^2 statistics. Lastly, to ensure robustness of the pooled estimate, sensitivity analyses were conducted to ensure robustness of the conclusions from a meta-analysis which was first assessed by removing each study, one at a time, to measure the effect of omission on the outcome. Another sensitivity analysis was performed by removing studies which received low-quality rating. Absolute percentage differences in the estimates are reported. Separate analysis was also conducted to compute the pooled estimates of the proportion of participants making first contact for treatment of mental disorders with specific providers. All analyses were conducted using STATA version 13 (StataCorp, College Station, TX, USA).

Results

Searches of the listed databases using the search string as well as hand-searching reference lists identified 698 potential articles. After screening titles or abstracts by both authors, 574 were removed as they did not meet all of the inclusion criteria. Full text reports were retrieved for 124 articles that reported on help-seeking populations for mental health problems, and on unique populations (i.e. duplicates removed). Of these, 64 were removed as they only reported qualitative data, and a further 46 were removed as they did not report the category of first-contact provider. Thus, 14 studies were included in this review. The selection process for included studies is illustrated in Fig. 1. A copy of the review protocol is available from the authors on request.

Of the 14 studies identified in the review, two were conducted in Ethiopia [20, 21], eight in Nigeria [22–29], three in South Africa [30–32] and one in Zimbabwe [33]. They consisted of the following populations: 11 had adult patients, one had adult caregivers of persons with mental disorders [30], one with both children and adults [20], and one with children and adolescents [27]. Nine studies had individuals with broadly defined mental disorders, while five included only persons with psychotic disorders. In terms of stage of illness, four consisted of only first-episode patients, while ten included both first and multi-episode patients. Participants were recruited from hospital inpatient units (four studies), hospital outpatient clinics (seven studies), both in- and outpatient units/clinics (two studies), and from primary care community health clinics (one study).

Determining the pathways to care, including categories of formal and informal healthcare givers consulted, was through interviews with participants. In six studies, the WHO Encounter Form was utilized (in two cases with modification of the instrument), one study used the Pathways to Care Schedule, and the remaining seven studies used a self-developed structured questionnaire. Details of the selected studies and category of first-contact provider of each study are presented in Tables 1 and 2.

Quality assessments performed on the 14 studies included in the review using the SAQOR tool found that studies varied from high to low in terms of overall quality. Three studies were assessed as high quality, four as moderate quality, and seven as low quality. Of the four domains assessed, the 'sample' domain was assessed as adequate in all but one study; while the 'distorting influences' domain was the weakest area with only four studies assessed as adequate. Details of the quality assessments are shown in Table 3.

The pooled proportion of participants making first contact for treatment of mental disorders with either of two broad categories of providers (informal, and formal) was as follows (Fig. 2): 48.1 % (95 % CI 36.4–60.0 %); and 49.2 % (95 % CI 38.0–60.4 %). Significant heterogeneity indicators were detected for informal ($\chi^2 = 694.98$, d$f = 13$, $p < 0.01$, $I^2 = 98.1$ %) and informal providers ($\chi^2 = 618.88$, d$f = 13$, $p < 0.01$, $I^2 = 97.9$ %). The sensitivity analysis based on one-study removed method indicated that, upon exclusion of any one study, the pooled proportion changed no more than 4 and 2.3 % respectively, for first contact for treatment of mental disorders with informal and formal providers. Similar analysis, based on removing studies which received low-quality rating ($n = 7$), yielded +5.7 and −7.0 %, respectively, for first contact for treatment of mental disorders with informal and formal providers. The pooled proportion of participants making first contact for treatment of mental disorders with specific providers was as follows (Fig. 3): traditional healer (17.0 %, 95 % CI 10.9–24.1 %); religious healer (26.2 %, 95 % CI 18.1–35.1 %); traditional/religious healer (0 %, 95 % CI 0–0.6 %); general health services (24.3 %, 95 % CI 16.9–32.5 %); mental health services (13.0 %, 95 % CI 5.1–23.5 %); and health/mental health services (0.6, 95 % CI 0–4.3 %).

It is interesting to note apparent inter-regional differences. For example, all six studies from countries other then Nigeria reported that 50 % or more of their participants attended formal health services as their initial health provider, while this was the case in only three of the eight studies from Nigeria. In contrast, all five studies reporting a majority of participants attending traditional and religious healers as their initial providers, were from Nigeria. It is notable that 60 % of the total population of all 14 studies, consisted of participants from studies located in Nigeria; the patterns of service use in Nigeria thus impact heavily on the findings of this review.

Discussion

Limitations of the review

Before entering into a discussion of this review, it is important to consider a number of limitations that should caution any firm conclusions. Firstly, all studies in the review come from Sub-Saharan Africa (with no North African studies) and only four countries are represented by these studies. Secondly, as will be discussed in more detail below, there was an over-representation of studies from Nigeria in this review, and patterns of care provider usage peculiar to that country are therefore likely to have exerted substantial influence over conclusions derived from this review. Thirdly, only half of the studies used a formal 'pathways to care' instrument in their methodology, which raises a degree of caution regarding the reliability of pathway-related data. Fourthly, our quality assessment of the included papers (using the SAQOR tool) showed that seven of the papers (50 %) were

scored as low in quality, with a failure to control for distorting influences being a particular weakness across many studies (see Table 3). Thus, the current review is based largely on a literature characterised by moderate to weak methodological rigour. Unfortunately this appears to be a common feature of this particular literature. Nevertheless, this constitutes a marked limitation of this review which should be borne in mind in assessing the findings. Fifthly, it is important to note that all studies recruited participants at formal health care sites, either hospitals or clinics. This is important because the help-seeking choices and behaviour of this population that managed to access these formal services may be different from those of the population of individuals who either did not attempt to or did not manage to access formal health care services. Thus we cannot compare our findings with those that might exist for community-based populations not accessed via formal health services. We cannot claim that the populations reviewed here are typical of all populations requiring or seeking care for mental health disorders. Particularly in contexts such as these, where formal health resources are often scarce and/or inaccessible, it is likely that a substantial portion of individuals requiring or seeking care for mental health disorders never in fact reach formal health services. Finally, a potential limitation of this review lies in the fact that we decided not to include search terms pertaining to addiction or substance use. This is because we were primarily interested in what might be termed 'primary mental disorders' and thus decided to omit studies of help-seeking populations whose specified problem was related to substance use. This decision thus limits our review to studies focused on help-seeking populations with primary mental disorders. Despite these limitations, our review does derive some important insights from this literature.

Regional differences in pathway to care

The results confirm that a substantial proportion of individuals presenting for care at mental health facilities in Africa had first consulted traditional and religious healers as their initial providers in their pathway to care. However, this proportion (weighted mean of 48.1 %) is not as high as the 80 % of the general population commonly cited in the literature [13, 14]. Importantly, as mentioned above in the limitations of this review, our finding does not negate the popularly quoted higher figure as the latter may derive from community-based surveys rather than from health service-based populations as in our study.

Another important observation is the fact that there appear to be regional differences in the extent to which either traditional or religious healers are chosen as first providers. While religious healers appear to be the more popular choice in East and West African countries (Ethiopia and Nigeria), traditional healers appear more commonly consulted in Southern African countries (South Africa and Zimbabwe).

It is also important to note that of the 4,080 participants included across all 14 studies in this review, 2,452 (60 %) were in Nigeria, with all five studies reporting a majority attending traditional and religious healers as their initial providers being from Nigeria. Thus, in terms of the African context, the 'over-representation' of Nigerian studies (and participants) in this review is likely to have resulted in an over-estimation of the proportion of participants consulting traditional and religious healers first in their pathway to formal mental health care. It is possible that the actual proportion of this population consulting traditional and

religious healers prior to accessing formal health care services across the whole continent is lower than the 48.1 % determined in this review.

Traditional and religious healers and delays in accessing mental health services

As stated in the introduction, an important consideration in relation to pathways to care is whether choice of initial care provider impacts on delays in accessing treatment. Within the African context, where a substantial proportion of individuals with mental health problems choose traditional and religious healers as their initial provider, addressing this issue is critical to the development of appropriate public mental health strategies. Reducing delays in accessing services and providing early intervention are key strategies in preventing morbidity associated with severe mental disorders such as schizophrenia [3, 4].

Several studies in the current review addressed this issue, albeit with different approaches and variable methods, which hinders attempts to compare and contrast findings. Specifically, four studies examined the association between consulting traditional or religious healers as first provider and experiencing relative delays in accessing mental health services. All were conducted in populations with first-episodes of mental disorders, mainly first-episode psychosis [20, 26, 29, 32], and reported longer delays in accessing mental health services where traditional or religious healers were the initial care providers.

This raises the question of how formal health providers, planners and policy makers should engage with informal providers, such as traditional and religious healers within LMIC contexts, in relation to improving pathways to care for people with mental disorders. While the biomedical agenda is to hasten individuals with mental health symptoms and disorders into formal mental health care, it is a fact that within resource-limited contexts the services needed to enable this to take place are not available. As a result, the formal health services often fail to meet the needs of individuals and communities [34].

Options, preferences, choices and decision-making in help-seeking behaviour

Our results confirm that people with mental disorders seek help from various formal and informal practitioners. Importantly, while we speak of 'pathways to care', these are often not linear routes, but rather recursive and complex. While it is not the focus of this review, it is relevant to consider the question as to why people make decisions to consult different types of practitioners. This too is a complex issue, and it would be erroneous to assume that all help-seeking decisions reflect actual individual preference or choice. Decisions about whom to consult may relate more to barriers such as availability, access, cost or family attitudes and preferences, than to individual patient beliefs and choice [23, 26]. Data on help-seeking from studies included in this review as well as from other studies, confirm that decisions and choices about which practitioner to consult are made both for reasons related to belief, choice or preference and for reasons related to structural health service failures [26, 35, 36].

There are multiple reasons for these structural failures. In many regions, particularly remote rural areas, health services are simply not available. Where services are available, the cost of traveling to clinics or hospitals, consultation and treatment fees, long queues, professional staff shortages, and lack of mental health capacity within general health services all become barriers to accessing appropriate care [33, 37–39]. Against this backdrop, and given that

traditional and religious explanatory belief systems and practices predominate in many LMIC regions, including Africa, it is thus understandable that causal attributions related to mental health symptoms often lead individuals and their families to traditional and spiritual/faith healers as their first port of call on the help-seeking pathway.

The importance of patient satisfaction with services provided should not be underestimated in affecting health-seeking behaviour. In Harare, Zimbabwe, Patel and colleagues found that in over 90 % of traditional consultations, individuals seeking help for common mental disorders were given an explanation for their illness (usually spiritual), while no explanation at all was recorded in 40 % of consultations with biomedical practitioners [33]. In such contexts, help-seeking individuals may well place greater value on healing practices that better address their existential anxieties about why they have become ill, than on tablets and injections provided by busy health workers in crowded clinics [40]. At the same time, it is important to recognise that individuals and families are strategic in their help-seeking behaviour and may place higher value on medical interventions (such as injections), despite holding seemingly contradictory beliefs about causation of the illness [23, 33, 41, 42]. Ultimately what is wanted is improved health; evidence from our own work in rural KwaZulu-Natal, South Africa (unpublished) shows that, irrespective of their causal attributions, individuals becoming ill with mental disorders and their families often consult multiple types of caregivers (both formal and informal)—sometimes consecutively and sometimes in parallel—in the course of their help-seeking journey.

Finally, it is important to appreciate the role of stigma in influencing individual choices in pathways to care. There is substantial evidence that stigma surrounding mental health conditions and mental health services are a considerable barrier for many individuals seeking care [26, 30, 39]. On the contrary, approaching traditional and religious healers is commonplace and usually devoid of stigma within African communities. As can be seen in many studies in this review, even when the majority of participants live in urban settings near to large psychiatric hospitals, (and this geographical access is presumably not a barrier), a considerable proportion choose traditional and religious healers as their first care provider [24–26, 29].

Improving pathways to mental health care in Africa

Efforts to improve pathways to mental health care in most regions of Africa therefore need to include strategies to engage with informal providers and healers [41]. There are a number of examples of successful collaboration between biomedical services and traditional healers in African countries in relation to tuberculosis and HIV counselling, screening, referral and co-management [43–47], raising the question as to this possibility for mental illnesses. Vikram Patel addresses this question, arguing that while such collaboration needs to be "guided by evidence and common sense … a mutually rewarding partnership between biomedical and traditional health care providers to reduce the treatment gap for mental illnesses in Africa" is possible and should be a goal of global mental health efforts [48]. Patel cites the World Health Organisation's 1991 declaration that "the full and proper use of traditional medicine makes an important and clear contribution to countries' efforts to achieve health for all by the year 2000" [49]. Commenting on a study by Abbo [50] in

Uganda, Patel makes the important observation that "not only were descriptions based on the biomedical classifications of psychoses recognised by the traditional healers, but… the indigenous taxonomy mapped on to the biomedical categories" [48]. In our own research in rural KwaZulu-Natal, South Africa, we have found the same surprising degree of correspondence between traditional categorisation of psychopathology and psychiatric classification systems. This is an important observation informing the discussion about potential collaboration between traditional and biomedical practitioners, as it suggests that common ground can be found in conceptualising what constitutes mental illness, despite highly divergent explanatory models.

A discussion of potential collaboration between traditional and biomedical practitioners would be incomplete without addressing the difficult reality of cases of human rights violations against people with mental disorders at the hands of informal healers [51]. An important objective of establishing collaboration between formal and informal systems must be to end such violations through understanding their causes and implementing solutions. Abusive practices may derive from various contributory factors including lack of mental health knowledge and literacy on the part of healers themselves, as well as specific culturally determined beliefs and practices related to their understanding of the causes of mental illnesses [52]. At the structural level, other contributory factors include lack of appropriate supervision of healers, lack of mental health legislation enshrining the rights of persons with mental illness, and stigma prevailing in society as a whole, making mistreatment more acceptable. Thus collaboration must include efforts to understand local causes of violations as well as programmes and interventions aimed at changing these behaviours and practices.

In conclusion, we should stress that there are of course additional strategies key to improving pathways to mental health care in Africa, for example, upscaling mental health capacity in primary care and other general health services. While these are beyond the scope of this review, they should not be overlooked in the current discussion. Multiple innovative approaches are called for in our efforts to close the mental health treatment gap in Africa, a continent characterised in most regions by considerable resource limitations. Despite several significant limitations, this review confirms that traditional and religious healers clearly play a major role in providing care in this context for many people suffering mental health problems. It thus an imperative that strategies to improve pathways to mental health care in Africa include innovative programmes aimed at fostering collaboration between biomedical mental health services and these key community-based providers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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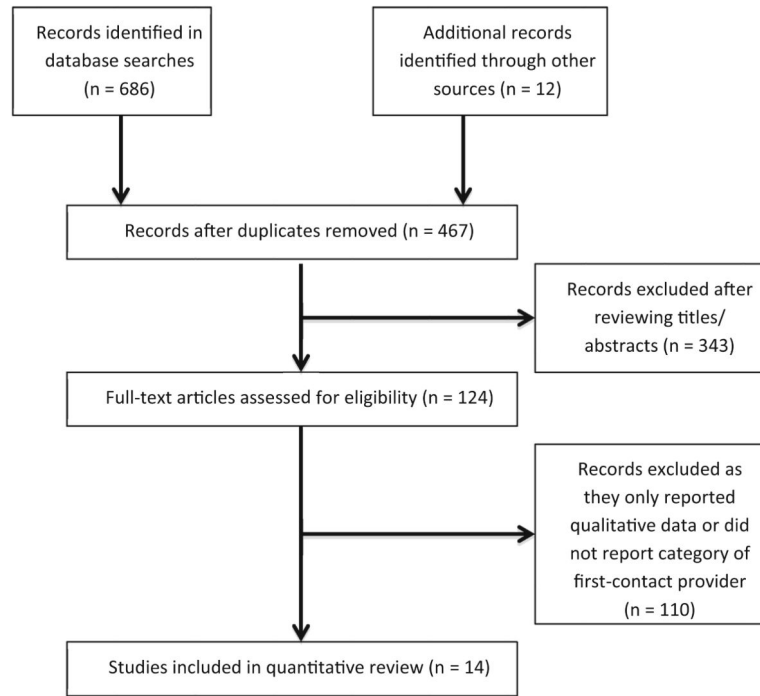
Fig. 1.
Flow diagram of selection process for identification of papers
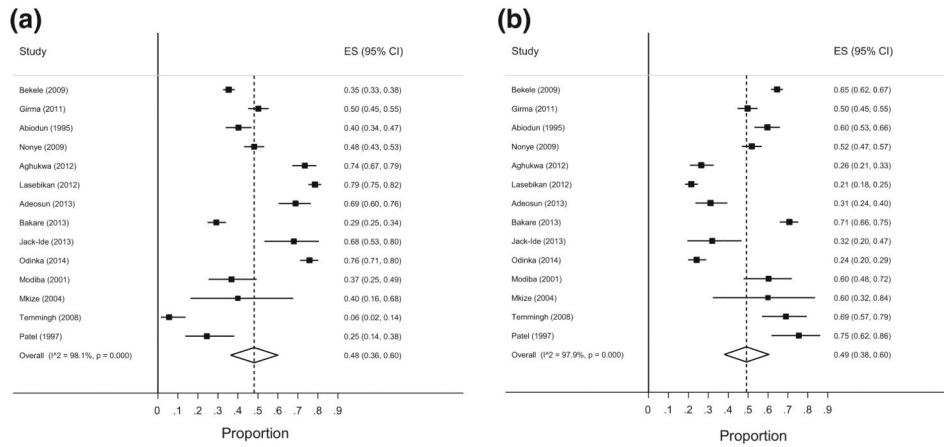
Fig. 2.
Proportion of study participants encountering **a** informal and **b** formal health provider. Informal health providers include traditional and religious healers. Formal health providers include health and mental health providers. Third category police not included above
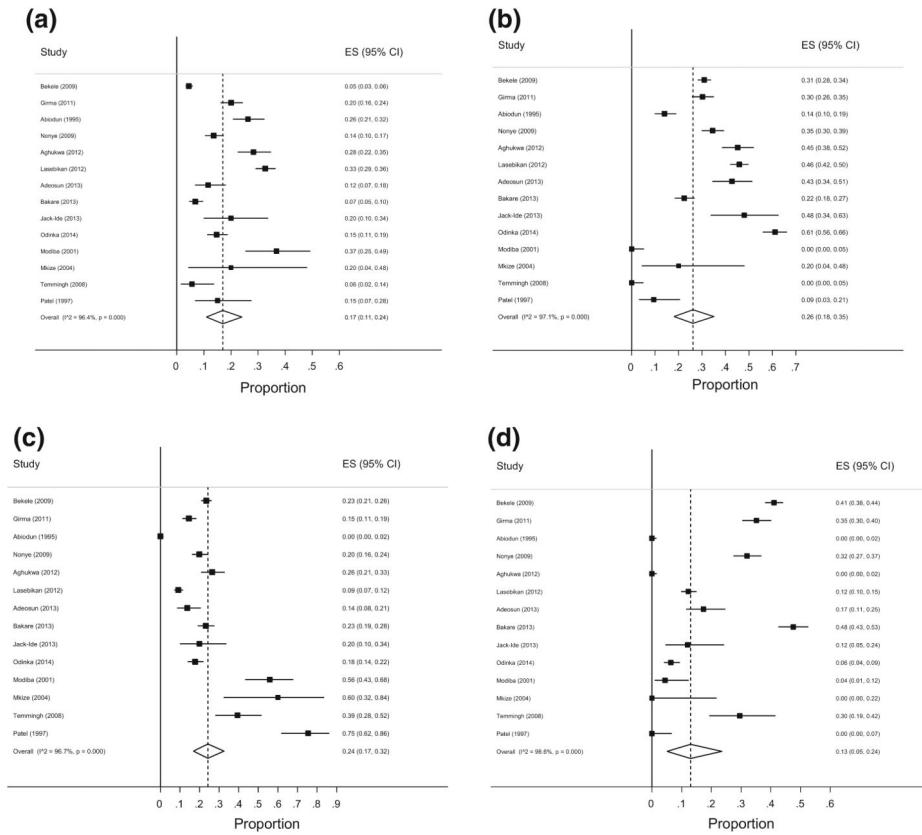
Fig. 3.
Proportion of study participants encountering **a** traditional healer, **b** religious healer, **c** general health services, and **d** mental health services. Dual categories (traditional/religious healer and health/mental health services provider), due to low percentage, are not shown above. 5th category of police are not shown above

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Table 1

Description of selected studies in systematic review

References	Country	N	Population	Stage of illness	Location	Methods
Bekele (2009)	Ethiopia	1044	2–85 years with mental disorders	First presentation	Hospital outpatient clinic	Encounter
Girma (2011)	Ethiopia	384	Adults with mental disorders	First & multi-episode	Hospital outpatient clinic	Encounter
Abiodun (1995)	Nigeria	236	Adults with mental disorders	First & multi-episode	Hospital outpatient clinic	Modified encounter
Nonye (2009)	Nigeria	397	Adults with mental disorders	First & multi-episode	Hospital inpatient unit	Interview
Aghukwa (2012)	Nigeria	219	Adults with mental disorders	First & multi-episode	Hospital inpatient unit & outpatient clinic	Modified encounter
Lasebikan (2012)	Nigeria	652	Adults with psychotic disorders	First & multi-episode	Hospital inpatient unit	Clinician administered questionnaire
Adeosun (2013)	Nigeria	138	Adults with schizophrenia	First presentation	Hospital outpatient clinic	Semi-structured interview
Bakare (2013)	Nigeria	393	Children & adolescents (3–18 years) with mental disorders	First presentation	Hospital outpatient clinic	Interview
Jack-Ide (2013)	Nigeria	50	Adults with mental disorders and family caregivers	Follow-up	Hospital outpatient clinic	Semi-structured interview
Odinka (2014)	Nigeria	367	Adults with schizophrenia	First presentation	Hospital outpatient clinic	Encounter
Modiba (2001)	South Africa	68	Caregivers of adults with mental disorders	Follow-up	Community clinics	Interview
Mkize (2004)	South Africa	15	Adults with psychotic disorders	First & multi-episode	Hospital inpatient unit	Interview
Temmingh (2008)	South Africa	71	Adults with psychotic disorders	First & multi-episode	Hospital inpatient unit	Encounter
Patel (1997)	Zimbabwe	53	Adults with mental illness	First & multi-episode	Primary health care community clinics	Pathways to care schedule

Table 2

First-contact providers in patients with mental disorders

References	Total	Traditional healer		Religious healer		General health services		Mental health/psychiatric Services		Police		Health/mental health [*]		Traditional/religious healer [*]	
	N	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Bekele (2009)	1044	47	5	323	31	245	23	429	41	0	0	0	0	0	0
Girma (2011)	384	77	20	116	30	56	15	135	35	0	0	0	0	0	0
Abiodun (1995)	236	62	26	33	14	0	0	0	0	0	0	141	60	0	0
Nonye (2009)	397	54	14	137	34	79	20	127	32	0	0	0	0	0	0
Aghukwa (2012)	219	62	28	99	45	58	27	0	0	0	0	0	0	0	0
Lasebikan (2012)	652	213	33	299	46	60	9	80	12	0	0	0	0	0	0
Adeosun (2013)	138	16	12	59	43	19	14	24	17	0	0	0	0	20	14
Bakare (2013)	393	27	7	88	22	91	24	187	47	0	0	0	0	0	0
Jack-Ide (2013)	50	10	20	24	48	10	20	6	12	0	0	0	0	0	0
Odinka (2014)	360	53	15	220	61	64	17	23	7	0	0	0	0	0	0
Modiba (2001)	68	25	37	0	0	38	56	3	4	2	3	0	0	0	0
Mkize (2004)	15	3	20	3	20	9	60	0	0	0	0	0	0	0	0
Temmingh (2008)	71	4	6	0	0	28	39	21	30	18	25	0	0	0	0
Patel (1997)	53	8	15	5	9	40	76	0	0	0	0	0	0	0	0

[*] Contains dual categories that could not be disentangled

Table 3

Quality assessment of included studies using SAQOR tool

References	Quality of sample	Quality of exposure/outcome	Distorting influences	Reporting of data	Summary quality rating of study
Bekele (2009)	Adequate	Adequate	Inadequate	Inadequate	Low
Girma (2011)	Adequate	Adequate	Adequate	Adequate	High
Abiodun (1995)	Adequate	Adequate	Unclear	Inadequate	Low
Nonye (2009)	Adequate	Unclear	Inadequate	Adequate	Low
Aghukwa (2012)	Adequate	Adequate	Inadequate	Adequate	Moderate
Lasebikan (2012)	Adequate	Unclear	Adequate	Adequate	Moderate
Adeosun (2013)	Adequate	Adequate	Inadequate	Adequate	Moderate
Bakare (2013)	Adequate	Unclear	Inadequate	Adequate	Low
Jack-Ide (2013)	Adequate	Adequate	Unclear	Unclear	Low
Odinka (2014)	Adequate	Adequate	Adequate	Adequate	High
Modiba (2001)	Adequate	Adequate	Inadequate	Unclear	Low
Mkize (2004)	Unclear	Adequate	Inadequate	Adequate	Low
Temmingh (2008)	Adequate	Adequate	Adequate	Adequate	High
Patel (1997)	Adequate	Adequate	Unclear	Adequate	Moderate