Psychosocial Family Interventions for Relatives of People Living with Psychotic Disorders in the Arab World: Systematic Review

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Abstract

**Aim and objectives:** To synthesise the available evidence about culturally-adapted psychosocial family interventions in the Arab world. The review identifies the content and characteristics of these interventions, determines the strategies used to adapt them to the Arab culture successfully, assesses the feasibility and acceptability of the interventions, and evaluates the effectiveness of these interventions for service users and their families.

**Background:** Family interventions in schizophrenia are evidence-based and have been adapted to different cultures to improve their effectiveness and acceptability in different settings. The Arab world has a unique set of sociocultural norms and values that cannot be ignored when developing or implementing such interventions. There is a lack of research on the feasibility of delivering family interventions for schizophrenia in the Arab region.

**Design:** A systematic review

**Method:** Five electronic databases were searched including MEDLINE, CINAHL, Cochrane Library, PsycINFO and EMBASE for articles written in Arabic and English from inception to August 2019. Data were extracted and synthesised narratively.

**Result:** Five studies were retrieved from the search: two randomized control studies, two non-randomized studies and one qualitative study. There is a paucity of evidence about culturally-adapted family interventions in the Arab region. However, the cultural adaptation process was comprehensive, and the implementation was feasible and acceptable. The methodological quality of the included studies was generally poor, so there is a risk of overestimating the effect of the interventions due to lack of rigour and the presence of bias.

**Conclusion:** The present review provided the foundation for future work about family interventions in the Arab world, and confirmed the feasibility of implementing such interventions in the Arab world with minor modifications. Furthermore, the data suggested that any alternative family-oriented intervention for schizophrenia is likely to be better than standard care in improving the outcome for patients and their families.

Background
Family interventions have been recognized as evidence-based practice and are recommended by national and international clinical guidelines (1-3). Although there are multiple approaches for family interventions in psychotic disorders, the core components are problem-solving skills, psychoeducation, and communication skills (4, 5). These interventions have multiple aims. First, they reduce any adverse effects from the family atmosphere by building a good alliance with the family, educating the family, reducing over-involvement and critical comments, and changing relatives' behaviours and beliefs (6). Second, they empower families with problem solving and communication skills to enhance their capacity in handling stress and reducing burden (7). Third, it helps the family maintain a realistic expectation about the patient and anticipating problems (8).

Family interventions have consistently shown positive outcomes for individuals living with schizophrenia and their families (9-11). However, a major criticism of such interventions is that they are based on Western models, and therefore they may not apply to other countries without cultural adaptation (12). Cultural adaptation is “the systematic modification of evidence-based treatment or intervention protocols to consider language, culture, and the context in such a way that is compatible with clients 'cultural pattern, meanings and values” (13). Cultural adaptation aims to modify interventions to fit the cultural context of each diverse group to enhance acceptability, engagement, satisfaction and, ultimately, their effectiveness (14-16). A considerable amount of literature has suggested that cultural context influences all aspects of the diagnostic and treatment process (13, 17). Therefore, people tend to accept and engage in interventions or treatment when they are congruent with their beliefs and values (14).

Recently, researchers have shown an increased interest in culturally adapting family interventions to different cultures to improve the acceptability and effectiveness of the treatment (12, 18-23). These studies have shown that there are optimal benefits when interventions are tailored for a specific culture. A recent meta-analysis of culturally-adapted mental health interventions found a moderate to significant effect for such adaptations (14). Another systematic review by Degnan et al. (2016) analyses the nature and outcomes of culturally-adapted psychosocial interventions in schizophrenia. This comprehensive review, which includes forty-six RCTs and 7,828 participants, showed significant
post-treatment effects in favor of adapted interventions. The review suggested a framework for cultural adaptation, including nine themes, concluding that the efficacy of the adapted intervention is proportional to the degree of cultural adaptation. In this review, the majority of studies were adapted for a majority population, which is unique compared to the other reviews, which were mainly for minority populations (14, 18, 24). The heuristic model proposed by Degnan et al. (2016) provides clear guidance for cultural adaptation in comparison to previously conducted reviews. However, they included varieties of cultures and psychosocial interventions for schizophrenia. Furthermore, the available adaptation frameworks have mostly been developed in Western countries for minorities groups, but might not work for indigenous populations like Arabs (14). Therefore, this review will focus on culturally adapted family interventions in the Arab world.

The Arab region consists of 22 countries that share a common language, cultural traditions and history. The Arab culture, including religion and tradition, plays a vital role in the political, social, and economic life of this Region (25). One crucial characteristic of Arab communities is the decisive role of the traditional family, which is considered the primary source of social support (26). It is an Arabic tradition to respect and protect family members, which was enforced by the adoption of Islam (27). Furthermore, the interdependency within the Arab family unit outweighs the value of individual independence (27). Therefore, seeking professional help is a family decision, and family members are the one who demonstrates an interest in the wellbeing of the patient and helps to carry the treatment program. Thus, it is very unusual for the patient to attend a psychiatric or medical practice on his/her own. It is evident from the points mentioned above that the Arab family plays a crucial role in caring for the patient; therefore, this review will focus on family intervention for psychotic disorders.

In addition to the familial nuances of Arabs, other cultural beliefs affect mental health practice. First, the belief of possession or evil eye affects the interpretation of mental illness (28). Second, Arabs usually somatise their psychological symptoms to avoid stigma (29). Third, traditional healers are favoured, and they have particular importance because of their claim of dealing with the unknown, and therefore, they are the first line for coping with mental illness (30). They are considered suitable for clients and less stigmatising. However, this could delay the help-seeking behaviours or prevent
treatment. Fourth, the strong stigma attached to mental illness and beliefs regarding envy prevents the family from disclosing various facts of family life to professionals (27). These Arabic cultural beliefs and practice influence the definition, aetiology, clinical presentation, diagnosis and treatment of mental illnesses. Therefore, the knowledge of such factors is essential to provide culturally competent care and avoid inappropriate delivery or poor compliance to the family intervention (31).

There are many practical barriers to mental health care in Arab countries, such as low literacy level and lack of resources and trained health care providers (28). In addition to the scarce resources, the experience of mental illness is complicated by the disadvantages of war, poverty and the stigma attached to mental illness. Therefore, culturally-adapted family interventions for psychotic disorders have the potential to improve the mental illness experience of Arabs globally. This intervention should be culturally relevant and within existing health services to increase the acceptability and ensure efficient use of the available resources.

Despite the promising positive effect of family intervention in Western countries, this type of intervention has not yet been incorporated into the routine treatment plan for patients with psychotic disorders in the Arab world. It is valuable to conduct a systematic review of local studies to uncover the effect of family interventions and examine the process of cultural adaptation. To date, little is known about culturally-adapted family interventions for schizophrenia within the Arab culture, making it challenging to design and test such an intervention. Therefore, to develop an effective intervention for schizophrenia, we need to understand service-user and carer previous experiences of family interventions in the Arab countries to learn from successes and failures. This review is conducted as a part of a larger study to develop a culturally adapted family intervention for people living with schizophrenia in Oman.

This review aims to synthesise the available evidence about culturally-adapted psychosocial family interventions in the Arab world. It will identify the content and characteristics of these interventions, determine the strategies used to adapt them to Arab culture successfully, assess the feasibility and acceptability of the interventions, and evaluate the effectiveness of culturally-adapted interventions for service users and their families.
Methods

Design

A mixed-method systematic review following the Preferred Reporting Items for Systematic Review and Meta-analysis was conducted (32). The protocol is registered on PROSPERO with registration number: CRD42019117180 https://www.crd.york.ac.uk/prospero/

Search Strategy

Five electronic databases were searched including MEDLINE, CINAHL, Cochrane Library, PsycINFO and EMBASE for articles written in Arabic and English from inception to August 2019. The databases were searched using the keywords and their associated Medical Subject Heading (MESH) “schizophrenia or psychosis” AND “Arab or Bahrain or Egypt or Iraq or Jordan or Kuwait or Lebanon or Libya or Morocco or Oman or Palestine or Qatar or Saudi Arabia or Sudan or Syria or Tunisia or United Arab Emirates UAE or Yemen”. When the key terms of “family intervention or psychosocial intervention or psychoeducation” were added, it limited the number of results to 5-8 studies only. Hand searching for studies in Arabic journals and reference lists of previous related reviews were done to identify any additional relevant studies. An example of the search strategy for a PsycINFO is available in the supplementary material.

Inclusion and exclusion criteria

Articles were included if they met the following inclusion criteria: 1) any study design that evaluated or developed any type or format of culturally-adapted psychosocial family interventions in the Arab world. The interventions could be relevant psychoeducation, family therapy, counselling, communication and problem-solving skills training or CBT. 2) Participants are relatives or family members who are caring for an individual with schizophrenia or related disorders. 3) The majority of carers (70% or above) are adults of 18 years or older, and the majority (70% or above) of the patients have schizophrenia or related disorders based on ICD-10. Articles were excluded if 1) participants had comorbid psychiatric disorders or substance abuse 2) the intervention did not include family members or caregivers 3) None- Arabic or non-English language.

Screening
The results were exported to Covidence (www.covidence.org), an online software product that improves the efficiency of creating and maintaining Systematic Reviews. Based on predetermined inclusion and exclusion criteria, the team members independently undertook the initial screening of titles and abstracts. Two team members (A.S. and L.R.) independently screened the full texts of selected abstracts. They both have experience in conducting and appraising systematic reviews. Areas of disagreement were resolved by consensus or by K.L who is an expert in the field.

**Data Extraction**

The extraction sheet was developed in Excel and refined after piloting it on three articles. Data extraction elements included study details, intervention characteristics, adaptation process, feasibility, and acceptability of the studies. The principle investigator extracted the data from the articles and entered them into the data extraction form, and then another member of the team verified them. Team discussions resolved discrepancy during the process of screening or extraction. The extraction sheet is available from the corresponding author.

**Methodological Quality Assessment**

Given the methodological variation of included studies, a range of quality appraisal tools were utilised. For RCTs, the Cochrane Collaboration's tool for assessing the risk of bias was used (33). It is a robust tool for assessing RCTs across six domains of risk (selection, performance, detection, attrition, reporting and other biases) (Zeng, et al., 2015). For non-randomised studies, we used the tools adapted from JBI for non-randomized trials; for qualitative studies, we used the one adapted from the Joanna Briggs Institute (JBI) (34). These tools have been developed using a transparent process and have been tested in many previous systematic reviews (See additional file 1 for the tools).

**Data Synthesis**

Meta-analysis was not possible due to the diversity of designs, outcomes measures and tools used. A narrative review was conducted focusing on the objectives of the review to draw conclusions and generate areas for future work about family interventions in the Arab world (Dochy, 2006; Green, Johnson, & Adams, 2006). Quantitative and qualitative studies were analysed, and the results were narratively synthesised according to the framework proposed by Popay et al. (35). The review
included one qualitative study; therefore, it was reported narratively with the quantitative studies.

The synthesis was initially conducted by the first author and regularly discussed with the research team.

Results

Search results

The database search yielded 933 titles and abstracts in addition to another two articles from hand searching. Following the removal of duplicates, 890 titles and abstracts were screened, after which 874 were excluded. The full-text articles of 13 references were obtained and considered against inclusion and exclusion criteria. Eight studies were excluded for different reasons, as shown in the PRISMA chart. These left five studies to be included in the final review (see Fig.1 for the PRISMA flowchart).

Study Characteristics

Five studies were retained as they met the inclusion criteria, including two studies from Jordan and three from Egypt. These were published between 2008 and 2018. In total, 344 dyads of patients and their caregivers were recruited into the studies. The designs were two RCTs (36, 37), two non-randomized trials (38, 39) and one qualitative study (40). See table 1 for the descriptive characteristics of the studies.

Quality Assessment

First, as shown in table (2), the methodological quality was good for Hasan et al. (2014) and poor for Rami et al. (2018), which has a higher risk of bias. Rami et al. (2018) stated that randomization was accomplished. However, they were not explicit about the method of randomization or allocation concealment, which makes it open to the introduction of selection bias. Furthermore, the study protocol was not available to assess the reporting bias, and the study did not provide a hypothesis or power calculation. They had multiple primary outcomes, including clinical, social, quality of life and attitude towards medications. The primary outcome should be the one that has the most existing evidence in direct association with the exposure of the intervention (41). Therefore, there should be one primary outcome to do a power calculation. All statistical differences between arms were
reported, but there was no report of effort to minimise bias.

Second, for non-randomized trials, the two studies have a high risk of bias because two or more criteria are not met according to the JBI tools (34) (see Additional file 2 for Methodological Quality of Non-randomized Trials).

However, there is not enough data reported to judge the quality in many instances. The study, done by Soliman et al. (2018), was reported as a cross-sectional interventional study. However, it is more consistent with quasi-experimental design because of the lack of randomisation and inclusion of the control and intervention group. The study risked bias in selecting participants because the sample was not randomized. Furthermore, the drop out was not reported, which could have affected the analysis. The study by El-Shafei et al. (2008), was reported as a case-control design, but the elements of the control group and randomization make it more consistent with experimental studies. They did not report the difference in basic characteristics between participants in both groups, which may have introduced a selection bias. They did not report a sample calculation, and they included 30 participants only. Furthermore, no details about attrition, loss to follow-up or outcome measurement were reported.

Overall, the quality of the included studies is poor, and none of these studies, except Hasan, et al. (2014) had the statistical power to detect the benefit of family interventions. This indicates that the included studies have a risk of overestimating the effect of interventions.

Third, the qualitative study done by Al-HadiHsan et al. (2017) is consistent with good quality studies according to JBI tool (34). The study did not follow any methodological theory for qualitative research because the authors were trying to answer the research question and explain the quantitative data. Two questions in the appraisal tool were not reported. First, locating the researcher culturally or theoretically in the study. Second, the acknowledgement of the potential influence of the researcher in the study and vice versa. Although these two points were not reported, they are more applicable to different qualitative methodological theories that were not followed in this study.

Intervention Characteristics

The interventions in the five studies were delivered in Egypt (3) and Jordan (2). The qualitative study
(40) was a second stage from another study in the review (37). Despite the difference in the content, all the studies shared the component of psychoeducation, and two included communication and problem-solving skills (36, 37), while ElShafei et al. (2006) used counselling sessions. Furthermore, they varied in term of intervention characteristics like mode of delivery, duration and numbers of the sessions. All studies were individual-family sessions and attended by patients and their caregivers. Three of the studies were delivered in a clinical setting in the outpatient department (36, 38, 39), and one was delivered using a booklet within patients home (37). The duration of the intervention ranged from 12 weeks to 6 months. The individual session duration was reported in one study as 60 minutes (Rami et al., 2018). Health care providers or researchers led all the interventions, and none of them was delivered in inpatient settings. All the studies compared family intervention to standard care. See table 3 for the Intervention Characteristics Table.

Contents and Components of the Interventions

Two studies reported the process of adaptation and modification of the original manuals. Hasan et al. (2014) used the framework of Atkinson and Coia, which covers Bloom's Taxonomy of Learning Domains, while Rami et al. (2018) used the Behavioural Family Therapy (BFT) manual by Mueser and Glynn (1999). However, for the component of psychoeducation, they adopted the program prepared by ElShafie and colleagues (2002), which was developed for Egyptian people.

First, psychoeducation components included signs, symptoms, aetiology, diagnosis, treatment, and relapse signs and management strategies for schizophrenia. Furthermore, it included truths and myths about schizophrenia and how these affect the persons' thoughts, emotions, and behaviour. The treatment component includes information about medication, its side effects, anticipated benefits of the medicine, adherence to treatment, the importance of follow-up, and information regarding prognosis. Furthermore, leaflets, which contain information about schizophrenia, high expressed emotions families, notes and homework assignments for the problem-solving and communication skills training, were distributed to participants during the sessions (Rami et al., 2018). Second, communication enhancement training included learning skills for active listening, delivering positive and negative feedback, and requesting changes in each other’s behaviours. Third, problem-solving
skills training included identification of specific family problems and practical advice for solving them. Fourth, the stress vulnerability model discusses the role of the family, burden of care, and stress management skills and strategies.

Strategies Used to Adapt the Intervention

The strategies for adaptation included different themes, but the common themes in all studies were language, context and delivery, and family. First, language adaptation was reported in all studies, and the content was modified and translated into simple Arabic, and the complexity of psychoeducation was simplified. Second, context and delivery adaptation appeared in all the studies as they delivered the intervention in individual therapy sessions instead of groups to facilitate the cultural context of Arabs. Third, all the studies acknowledged the vital role of the family and the distinct Arab family structure and processes.

Rami et al. (2018) was the only study which reported a detailed process of cultural adaptation. They piloted the intervention before the actual study to assess the acceptability and linguistic accessibility, and they modified the intervention accordingly. Furthermore, the theme of concepts and illness models was incorporated by increasing the number of sessions regarding the biological basis of the illness from one in the original BFT manual to two sessions. They adapted the content to incorporate cultural norms and practices by including folk stories relevant to the cultural and religious beliefs of the participants. Further to these adaptations, the program in Rami, et al. (2018) was shortened to six months instead of nine because of practical and financial reasons that may influence adherence and attendance.

Feasibility and Acceptability of the Interventions

Feasibility included the assessment of recruitment, attendance, retention (the proportion of participants who complete therapy sessions) and the compatibility of the interventions with the available resources. All the studies reported a feasible recruitment process without significant barriers or difficulties. The attendance was also feasible because two of the studies (36, 38) delivered the interventions during the follow-up appointment, which ensured a high level of attendance. The third study by Hasan et al. (2014) was delivered via a booklet to patients’ homes. The study by El-Shafei et
al. (2008) did not report attendance. The assessment of retention was reported in two studies only (36, 37). Rami et al. (2018) reported that four subjects from the case group and six subjects from the control group missed their regular sessions. The dropout in the Hasan et al. (2014) study was six from the intervention group and ten from the control group. All the studies reported compatibility of the intervention with the available resources. The study by Rami et al. (2018) reported that the intervention was applicable and accessible because of the brevity of the program. Furthermore, meeting the needs of caregivers enhanced the feasibility of the program.

Acceptability is defined as "a multi-faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention" (42). Hasan et al. (2014) followed his trial with a qualitative study to assess the acceptability of interventions. The qualitative interviews with service users and caregivers confirmed the acceptability of the interventions. They found that interventions using booklets was appropriate and valuable. No other studies examined acceptability.

Effect of Interventions
The outcomes reported across the studies vary a great deal, and most of them did not distinguish primary from secondary outcomes. The most frequently reported primary or secondary outcome is the severity of symptoms using the Positive and Negative Syndrome Scale (PANSS). The four studies found a statistically significant difference between the two groups concerning positive and negative symptoms experienced by service users, favouring the intervention group. Furthermore, Hasan et al. (2014) found a reduction in the severity of symptoms at three months follow-up. Other frequently reported outcomes were social functioning, adherence to medication, quality of life and knowledge of schizophrenia. One study only assessed family outcomes, including the family burden of care and carers’ quality of life. (See Table 4 for the results of each outcome).

Discussion
In this novel review about culturally-adapted family interventions for psychotic disorders in the Arab world, we found a paucity of local studies to guide the ongoing development of family interventions in this area. Egypt and Jordan are the only two countries from the 22 countries in the Arab world that
have published peer-reviewed papers on this topic. It is widely acknowledged that the Arab region has limited local research to guide the culturally appropriate development of different services in mental health (43, 44). The mental health status in the Arab world is still low compared to industrialized countries because the health and education budget is still below requirements (28). Furthermore, Okasha et al. (2012) found in their summary about mental health services in the Arab world that some Arab countries do not have mental health legislation, and some do not even have mental health policies. Most countries have less than 30 psychiatric beds per 100,000 of the population. Therefore, the insufficient resources and services, and lack of research capability to enhance capacity for conducting high-quality research, gives an indication of the amount and quality of research in this area (28, 45).

Cultural adaptation of the family intervention

The cultural adaptation process of family interventions in the Arab world was consistent with some of the themes found in previous studies including language, content, concepts and illness models, cultural norms and practice, context and delivery, and family (16, 18, 19). The unique cultural factors that mainly affected content adaptation are the low level of literacy in the Arab world and the unique set of cultural and spiritual values. Therefore, the language was simplified, and the number of sessions about the biological basis of the illness was increased. Diverse explanatory models were also incorporated because most Arab people believe strongly in the existence of supernatural reasons like black magic and jinn, and they usually relate mental illness symptoms to these reasons (31). Consequently, they seek help from traditional healers because they believe that they can treat the spiritual cause by using many religious practices (31). However, these practices will not treat the mental illness, and the patient will still suffer. Therefore, some studies strongly recommended incorporating discussion sessions about spiritual factors and cultural-specific belief system in the psychoeducation (22).

This review identified two Arabic translated and adapted manuals that can be used in future studies in the Arab world with minimal modification depending on the specific country’s norms and traditions. One interesting finding was that all the interventions were a single-family format. The authors related
this to the stigma and discomfort Arabic people feel when discussing the details of their relatives in front of other families. Rami et al. (2018) faced this barrier when they piloted the adapted intervention and families preferred to have individual family session rather than in groups. This finding contradicts what was found in an Iranian study (46) that culturally adapted psychoeducation for family members and they used group therapy based on needs assessment. Even though Iranian culture is similar to Arabs, but having caregivers in groups increased their comfort in talking to others about their problems. This indicates the necessity of performing need assessment during the process of cultural adaptation because preference may differ across the countries in the Arab world.

All papers reported some level of adaptation, but often poorly except Rami et al. (2018). Their process was comprehensive, including piloting the intervention to examine its acceptability and language simplicity and modifying the content accordingly before starting the actual study. This element was congruent with most of the developed culturally-adapted interventions to ensure the usefulness and efficacy of delivering the intervention (18, 47). Another element of adaptation was providing the participants with leaflets that contain the primary information learned in each session. This technique ensures reinforcing learning and spreading information to other members of the family and the community. This was in contrast with the findings from the systematic review by Chowdhary et al. (2014), where they try to use non-written material to simplify the information. In the Arab world, it could be more helpful to use non-written material like videos because of the low level of literacy.

However, the study by Hasan et al. (2014) delivered psychoeducation via a booklet in Jordan, the results were promising, and it was valuable in enhancing the participants’ knowledge.

Comparing and contrasting the adaptation process between minority populations and indigenous population, we noticed that other adaptation themes such as matching the therapist and clients for ethnicity and other characteristics are more applicable to the minority population in Western countries (48). Because in their original countries, the process does not require learning about the culture or matching the therapist ethnic background with the patient. Hence, it could conceivably be hypothesised that culturally adapting the intervention for an indigenous population could be a relatively more straightforward process if the resources are available compared to adapting it for
minority populations in western countries.

The findings of this study suggest that the adaptation process for family interventions in the Arb world seems robust because it is congruent with the themes from previous systematic reviews. Furthermore, it gives a clear indication that such interventions are feasible and acceptable enough to be applied in Arab countries.

**Effectiveness of family intervention**

Assessing the effectiveness of the interventions was not a major objective of this review. Even if we wanted to do so, the evidence is not available, mainly because of the poor methodology of the included studies. There was clinical heterogeneity in the characteristics of the included studies such as study design features, methods for diagnosis and evaluation, follow-up, and treatment duration. However, the similarities included recruiting participants from the outpatient clinics, using PANSS to measure the improvement in clinical symptoms, including both patients and their caregivers in the intervention and using individualized sessions instead of a group.

The studies showed a positive effect favouring the intervention groups in different outcomes, such as the severity of symptoms, quality of life for service users and their caregivers, social function, the adherence to medications and knowledge of schizophrenia. The severity of symptoms using the Positive and Negative Syndrome Scale (PANSS) was a common outcome measure used in all studies. Even though the studies showed a positive impact on different outcomes, which is in agreement with previous systematic reviews (14, 18, 19), the findings may not be valid because of the size and poor quality of the included studies. No studies, except Hasan et al. (2014), had the statistical power to detect a difference in the primary outcome identified. There was substantial heterogeneity in design, types of interventions and outcomes, in addition to a small number of studies. All these reasons made meta-analysis impossible. However, the meta-analysis by Degnan et al. showed that the different types of interventions had generally similar efficacy, which can be referred to the common components that are important to specific outcomes even with different cultures.

The qualitative study by Al-Hadi Hasan et al. (2017) explored the underlying processes for the observed effect of the intervention. Many interesting themes emerged, including “awareness of
The study illuminated the process of applying the knowledge about schizophrenia in the life of patients and their caregivers. This knowledge improved the self-efficacy and empowered participants to take an active role in the treatment plan. Furthermore, it enabled patients to manage their condition and handle internalized stigma. The intervention helped the caregivers in reappraising the demands and handling challenging behaviours better. Additionally, they were able to control the stressors at home and monitor early signs of relapse. The intervention provided patients and their relatives with knowledge, skills and coping strategies to manage schizophrenia. This study demonstrated that the limited knowledge of the mental illness in Arabs was associated with shameful feelings, self-stigma and other negative feelings like depression, which could cause noncompliance to treatment and consequently reduce the quality of life. Family members can have a significant role in improving the outcome of the patient and consequently increase their adaptability to the caregivers' role. This process can be achieved by educating the family to orient them to the patient’s symptoms and behaviours and equip them with the necessary skills to cope with them.

**Strengths and limitations**

One strength of this review is that participants were from a similar culture in the Arab world, speaking the same language, which could be unique compared to previous systematic reviews that included several cultures (14, 19). Furthermore, the process of searching was thorough, and the protocol was rigorously followed for study selection, data extraction, analysis and synthesis. The study by Hasan et al. (2017) was followed by a qualitative study to explore the mechanism and process underlying any observed effect. It is well documented that culture has a significant role in how mental illness is interpreted and treated (49). Therefore, richer data from the qualitative study strengthened the result of the review by providing a deeper understanding of the intervention effectiveness in light of cultural factors for Arabs (50).

A major limitation of this review was the small number of included studies that were variable in design, characteristics and components of the interventions. This restricted the conclusion regarding the different objectives of the review and made the meta-analysis impossible. Furthermore, there was
little distinction between primary and secondary outcomes of the included studies, which caused confusion and made it difficult to interpret whether the treatment effect differed across outcomes. It is worth noting that the quality of most studies was poor, and some of them are at high risk for bias. Therefore, the result should be interpreted with caution. The review included only published papers and this could introduce publication bias.

**Implications**

It was not possible to make any conclusion about the effectiveness of such interventions in the Arab world with the available literature. However, the recommendation of national and international clinical guidelines to integrate family intervention to routine care, invite more efforts to improve the delivery of such intervention in the Arab countries. If it cannot be integrated fully, at least simple written materials can be offered to the patients and their families. The patients and families can access these materials at their convenience and discuss them with the treating team during the follow-up appointments. This may improve the family’s confidence in dealing with the patient's challenging behaviours and give them clear expectations. This method is simple and requires minimal staff training and resources which is suitable for use in the Arab countries that have limited resources. The findings of this review confirmed that the attempts to develop and test culturally adapted family interventions are still fragmented in the Arab world. Therefore, a systematic process of developing and evaluating such interventions should be applied for the benefit of a more substantial proportion of the Arabic population. Further research, using a more suitable methodology such as an RCT with a large sample and specific outcomes is recommended to establish and gain a better understanding of the possible effects of such interventions in Arab countries. Another avenue for future research would be to assess family outcomes and the acceptability of such intervention for healthcare professionals and identify barriers to the implementation.

**Conclusions**

This study set out to identify the content and characteristics of culturally-adapted family interventions in the Arab world and to determine the strategies used for adaptation. Furthermore, it aimed to assess the feasibility, acceptability and effectiveness of these interventions. The present review
provides the foundation for future work about family interventions in the Arab world. It provides guidance for the translated manual and tools for different outcomes. Furthermore, the adaptation process seems robust, but the rigour of testing is mostly absent. The review confirmed the feasibility of implementing such intervention in the Arab world with minor modifications. The data suggested that any alternative family-oriented intervention for schizophrenia- even a short term one- can be better than the standard care and it could improve the outcomes for patients and their families in the Arab world.

This review could be part of a body of literature that is relevant to the needs of Arabic people worldwide, and it will inform the development of family interventions for relatives living with schizophrenia in Oman. Furthermore, it could facilitate future research into effective interventions and provide much-needed resources for implementing family interventions for Arabic people globally.

Declarations

Ethics approval and consent to participate
Not applicable

Consent for publication
Not applicable

Availability of data and materials
The datasets used and analysed during the current study are available from the corresponding author on reasonable request

Competing interests
The authors declare that they have no competing interests.

NH is the chair of board of Trustees of Manchester Global Foundation. NH has published work on culturally adapting and testing family interventions for Psychosis/Schizophrenia.

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Authors' contributions
AA runs the databases search, obtained the articles, extracted the data, critically appraised them,
analysed and interpreted the data and was a major contributor in writing the manuscript. KL, LR & NH contributed to the conception and design of the work and substantively revised the manuscript. All authors read and approved the final manuscript.

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Abbreviations

RCT: randomized control trial
PROSPERO: prospective register of systematic reviews
ICD-10: International Classification of Diseases -10
JBI: The Joanna Briggs Institute
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PANSS: Positive and Negative Syndrome Scale

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Tables
Table 1: the descriptive characteristics of studies.

| Study | Country | Aim | Sample size | Study design | Intervention/s | Main outcomes |
|-------|---------|-----|-------------|--------------|----------------|---------------|
| Rami, et al. (2018) | Egypt | to assess the effectiveness of patient and caregiver schizophrenia psycho-education program and its impact on improvement of psychopathology and quality of life (QoL) | 30 patients with their caregivers | randomized controlled prospective intervention study | culturally sensitive Behavioral Family Psycho-Educational Program (BFPEP) | 1. the rate of improvement of clinical variables including |
| Study (Year) | Country | Methodology | Measures |
|-------------|---------|-------------|----------|
| Hasan, et al. (2014) | Jordan | To investigate the effectiveness of psychoeducational intervention delivered via a printed booklet on people diagnosed with Schizophrenia and their primary caregivers’ outcomes | Knowledge of schizophrenia, Schizophrenia symptoms, Family Burden of Care, Quality of life of caregivers |
| Al-Hadi Hsan, et al. (2017) | Jordan | To explore potential processes underpinning any observed effect received from psychoeducational intervention via booklet in (Hasan et al., 2015) | Acceptance of psychoeducation by booklet |
| Article                        | Egypt         | Intervention                                                                 | Control Intervention                      | Psycho-education | Intervention | Severity of symptoms | Quality of life |
|-------------------------------|---------------|------------------------------------------------------------------------------|--------------------------------------------|------------------|---------------|-----------------------|----------------|---------------------|
| Soliman, et al. (2018)        | Egypt         | 58 patients with their caregivers                                            | 58 patients with their caregivers         | non-randomized   | control trial     | 1.                    |                 |
|                               |               | intervention                                                                |                                             |                   |               |                       |                 |
|                               |               | to assess the effectiveness of patient and caregiver schizophrenia           |                                             |                   |               |                       |                 |
|                               |               | psycho-education program and its impact on improvement of psychopathology   |                                             |                   |               |                       |                 |
|                               |               | and quality of life (QoL)                                                   |                                             |                   |               |                       |                 |
| El-Shafei, et al. (2008)      | Egypt         | 15 patients with their caregivers                                           | 15 patients with their caregivers         | non-randomized   | control trial     | 1.                    |                 |
|                               |               | intervention                                                                |                                             |                   |               |                       |                 |
|                               |               | to establish a pilot study to examine the effect of family psycho-education  |                                             |                   |               |                       |                 |
|                               |               | and counselling on the outcome of schizophrenia especially regarding        |                                             |                   |               |                       |                 |
|                               |               | medication compliance, social functioning, clinical condition, relapse and   |                                             |                   |               |                       |                 |
|                               |               | hospitalizations                                                            |                                             |                   |               |                       |                 |

Table 2: RCT quality assessment

| Article                        | Selection bias | Performance bias | Detection bias | Attrition bias | Reporting bias | Other bias | Total |
|-------------------------------|----------------|------------------|----------------|----------------|----------------|------------|-------|
| Hasan et al. (2014)           | low            | low              | high           | low            | low            | low        | 6/7   |
| Rami et al. (2018)            | high           | high             | high           | low            | low            | high       | 2/7   |
Table 3: Intervention characteristics table

| author          | Adaptation model                                         | Type of intervention | Components of the intervention                                                                 | Model (group/individual) | setting          | Interven tion attendee(s) | No. of session/duration/frequency |
|-----------------|-----------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------|--------------------------|-----------------|--------------------------|-----------------------------------|
| Rami et al. (2018) | BFT manual by Mueser and Glynn, 1999. The educational component was adapted from the psychoeducation program by ElShafie and colleagues (2002). | Culturally sensitive Behavioral Family Psycho-Educational Program (BFPEP). | psycho-education + communicaton enhancement + training + problem-solving skills training | individu al         | outpatient clinic | Caregivers and patients | 14 one-hour sessions (weekly in the first two months, twice/month in the second two months, then every three weeks for the last two months) |
| Hasan et al. (2014) | based on the framework of Atkinson and Coia (24), it covers Bloom's taxonomy of learning domains | psycho-education by booklet | psycho-education + stress management strategies + problem-solving intervention | individu al         | Community/sent to patients' home | Caregivers and patients | a psychoeducation booklet each fortnight |
| Soliman et al. (2018) | Not reported                                               | psycho-education     | Mainly psycho-education                                                                | individu al         | outpatient during follow-up | Caregivers and patients | 6 (one sessions/month)/duration not reported |
| (32)             | psycho-education and counselling sessions                 | Psycho-education + counselling sessions |                                                                                         | individu al         | outpatient         | Caregivers and patients | Not reported                    |

Table 4: the Results
| Author                  | No. of participants | Outcome (primary or secondary)                                      | Scale                                                                 | Result for each outcome                                                                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------|---------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eman S. Soliman        | 116 patients and their caregivers. | Severity of symptoms (did not specify)                              | Positive and Negative Syndrome Scale (PANSS)                         | There is a statistically significant difference between group A patients, who received PCSPP, and group B patients, who received TAU, as regards severity of symptoms and the rate of improvement of clinical variables (primary).                                                                                                                                                                                   |
|                        |                     | Quality of life (did not specify)                                   | World Health Organization Quality of Life Questionnaire-short version (WHOQoL-BREF) (Arabic version) M4 | There is a statistically significant difference between group A and group B regarding the severity of symptoms, and the rate of improvement of clinical variables (primary).                                                                                                                                                                                                                      |
| Hisham Rami            | 60 patients and their caregivers | the rate of improvement of clinical variables (primary)             | The Positive and Negative Syndrome Scale (PANSS)                     | A statistically significant difference between group A and group B regarding the rate of improvement of clinical variables (primary).                                                                                                                                                                                                                       |
|                        |                     | Social functions (primary)                                          | The Social Functioning Questionnaire (SFQ)                           | A statistically significant difference between group A and group B regarding the social functioning questionnaire (SFQ) and the rate of improvement of social functions (primary).                                                                                                                                                                                                 |
|                        |                     | the adherence to medications (primary)                              | Drug Attitude Inventory (DAI) (Hogan, Awad & Eastwood, 1983)         | Found a statistically significant difference between group A and group B regarding the adherence to medications (primary) and the rate of improvement of medications (primary).                                                                                                                                                                                                 |
|                        |                     | quality of life of the patients (primary)                           | Quality of Life scale (QLS) (Heinrichs, Hanlon & Carpenter, 1984)   | Better quality of life at post-treatment intervention group compared to controls.                                                                                                                                                                                                                                                                                 |
| El-Shafei              | 30 patients and their caregivers | clinical condition (did not specify)                               | Positive And Negative Syndrome Scale (PANSS) (Kay, et al., 1987).    | A significant improvement in the level of social functioning (primary) and the rate of improvement of medications (primary) occurred in patients in the intervention group compared to controls over time.                                                                                                                                                               |
|                        |                     | Social functioning (did not specify)                                | Social Functioning Questionnaire (SFQ) (Clifford 1987)               | Statistically significant improvement in the social functioning questionnaire (SFQ) and the rate of improvement of medications (primary) occurred in patients in the intervention group compared to controls over time.                                                                                                                                 |
|                        |                     | Medication compliance (did not specify)                             | The Drug Attitude Inventory (DAI) (Awad, 1993)                       | A significant improvement in the medication compliance (did not specify) occurred in patients in the intervention group compared to controls over time.                                                                                                                                                                                                     |
| Abd Alhadi Hasan       | 112 dyads of patients and their caregivers | knowledge of schizophrenia (primary)                               | Knowledge about Schizophrenia Questionnaire (KASQ)                   | Participants in the intervention group had a statistically significant improvement in knowledge of schizophrenia (primary) and the rate of improvement of medications (primary) occurred in patients in the intervention group compared to controls over time.                                                                                                                    |
|                        |                     | Schizophrenia symptoms (secondary)                                  | Positive and Negative Syndrome Scale (PANSS) for PDWs               | PANSS scores show that intervention with a reduction in symptom severity was associated with improvement in knowledge of schizophrenia (primary) and the rate of improvement of medications (primary) occurred in patients in the intervention group compared to controls over time.                                                                                       |
|                        |                     | Family Burden of Care and quality of life (secondary)               | Family Burden Interview Scale (FBIS) Schizophrenics' Carers' Quality of Life Scale (S-CQoL) | the group and time effect were statistically significant for all primary caregiver outcomes and the rate of improvement of medications (primary).                                                                                                                                                                                                                       |
Figures

Figure 1

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) flow chart describing the study selection process along with the reasons for exclusion.

Supplementary Files

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