

## **The effects of polygamy on children and adolescents: a systematic review**

Mohammad Al-Sharfi, Karen Pfeffer and Kirsty A. Miller

School of Psychology, University of Lincoln, Lincoln, LN6 7TS, UK

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## **Abstract**

**Objective:** The objective was to review research that examined the effects of polygyny (a specific form of polygamy) on children and adolescents. A systematic literature search and review was conducted of research published 1994 - 2014 that focused on psychological variables, primary data collection, and compared data on children and adolescents from polygynous families with monogamous families. Critical analysis included the relevance of methods to the culture, including the psychometric properties reported.

**Main outcomes:** A total of 13 papers satisfied the inclusion criteria. The review found more mental health problems, social problems and lower academic achievement for children and adolescents from polygynous than monogamous families. Similarities between children and adolescents from polygynous and monogamous families included self-esteem, anxiety and depression scores.

**Conclusions:** Although polygynous family structures appear to have detrimental effects on children and adolescents, the mediating effects of parental education, economy and family functioning need to be investigated.

**Key words:** polygamy, polygyny, adolescents, children, family structure

## **Introduction**

Polygamy is a marital relationship involving multiple spouses and occurs in several forms. The most common form of polygamy occurs when a man has more than one wife at the same time, known as polygyny. Less frequently, it occurs when a woman has more than one husband (polyandry) and when more than one husband is married to more than one wife (polygynandry) (Goodwin, 1999; Valsiner, 2000). Polygamy is legally practised in various countries in the Middle East, Asia and Africa, although not practised by all. Factors affecting the occurrence of polygamy include social, economic and religious factors (Al-Shamsi & Fulcher, 2005). The focus of this review is on the most common form of plural marriage, polygyny, i.e. one husband with more than one wife.

Most research on polygyny has focussed on the adults rather than the children in the family, particularly the wives. Research on the effects of polygyny on women has found detrimental effects on the mental health of wives (Abbo, Ekblad, Waako, Okello, Muhwezi & Musisi, 2008; Al-Krenawi and Graham, 2006; Shepard, 2012). Also, limited research on husbands in polygynous marriages has found that polygyny can be detrimental to husbands (Al-Krenawi, Slonim-Nevo and Graham, 2006). Research and reviews on children in polygynous families has hypothesized that family structure is important for child and adolescent development. Among the various family structures experienced by children, polygynous family structures have received less research attention from psychologists. Some researchers have emphasised the potential benefits to children in large polygynous families, such as the availability of numerous role models (Swanson, Massey & Payne, 1972; Valsiner, 1989). Others have reported large variations in children's experiences, both positive and negative (Kilbride & Kilbride, 1990; Valsiner, 2000). However, much of the research has identified negative outcomes for children, including academic outcomes as well as psychological outcomes such as internalizing problems, externalizing problems and mental

health problems (Al-Krenawi, Graham & Slonim-Nevo, 2002; Al-Krenwai and Slonim-Nevo, 2008; Elbedour, Onwuegbuzie & Alatamin, 2003; Al-Shamsi & Fulcher, 2005). Family variables and hypothesized risk factors associated with polygyny that could influence children's developmental outcomes include marital conflict, marital distress, father absence, the happiness or distress of the wives in polygynous marriages, financial stress and parental education (Elbedour, Onwuegbize, Caradine and Abu-Saad, 2002).

Although there have been systematic reviews of the effects of polygyny on women (Shepard, 2012) and a comprehensive review on the effects of polygamy on children (Elbedour et al., 2002), there is a lack of systematic reviews of primary research that focusses on the effects of polygyny on child development. The objective of this review was to carry out a systematic review and critically examine studies on the effects of polygyny on children and adolescents.

## **Method**

Procedures for systematic reviews were followed as outlined by Booth, Papaioannou and Sutton (2012), Gough, Oliver and Thomas (2012) and the Evidence for Policy and Practice Information and Coordinating Centre (2007, retrieved May 2014).

### ***Information sources and search strategy***

The search strategy involved finding relevant articles published between 1994 and 2014. The following search limiters were set; date published (1994-2014), source type (academic journals) and language (English). Electronic databases relevant to the topic were searched, including African Journals Online, ASSIA, BioMed Central, also PsychArticles and PsychInfo (through EBSCO). Keywords used were 'polygamy', 'polygyny', 'child', 'children', 'adolescent', 'adolescence'. Terms were used singularly and in combination. Also, authors known to have published relevant papers were searched through electronic networks

for academics and electronic search engines. Hand searches of the reference lists of key articles were searched for additional papers.

### ***Inclusion and exclusion criteria***

Peer-review was used as minimum quality criteria, so only peer-reviewed academic papers were included. Consequently, books, theses, conference papers and unpublished papers were not included. Papers were included for full screening if they met the following criteria; the research must include polygynous families and/or polygynous marriages where there is one husband and multiple wives, the research should report on children and/or adolescents aged 18 years and younger. Data obtained from children and adolescents or data about children and adolescents (reported by significant adults such as parents or teachers) should be reported independently or be extractable. Papers should be written in the English language and published between 1994 and 2014. Also, research methods used in the research papers should be focussed on psychological variables, primary data collection using quantitative methods and/or qualitative methods, comparative studies that used family type/ family structure as an 'independent' variable. Exclusion criteria were as follows; studies of wives or husbands only (not including children), studies of adults (older than 18 years), secondary data analysis, papers not including psychological variables (i.e., child growth, child mortality rates, etc.), papers that did not include comparisons between family types, review papers, papers published before 1994, papers not in English.

### ***Study selection***

Initial searches yielded 111 abstracts for potential review. Duplicates were removed. After reading through the abstracts for inclusion criteria and visually scanning the method and results sections for evidence of extractable data about children or adolescents in polygynous families, the number of papers remaining for reading was 19. Additional searches of

electronic networks, search engines and hand searches of reference lists by the first and second authors yielded a further 3 articles. Four papers were excluded due to insufficient information about the sample, research design or procedures. Five papers were removed because they did not include a comparison between polygynous families and other family types (e.g., monogamy, polyandry). A total of 13 papers were reviewed. Initial searches, inclusion and exclusion decisions were carried out by the first and second authors independently. Consensus was reached by discussion.

### ***Data extraction***

The following information was extracted from papers selected for review and entered into a spread sheet: author, publication date, country or culture of the sample, research design, participant information (e.g., gender, age range, parental education, income and employment), sample size, data collection tool used (e.g., questionnaire, interview schedule, clinical test, etc.), dependent variables measured, and main findings. All studies were read and reviewed independently by two reviewers. Where disagreements occurred these were resolved by discussion with a third reviewer.

For this review, the quality assessment and risk of bias focussed on the relevance of methods to the culture, including the psychometric properties reported. We noted the type of translation reported in cases of research using psychological tests and instruments that were not developed locally, e.g., whether back-translation was used. Also, we noted the controls included in the research design and the limitations of the research.

## **Results**

A total of 13 studies were reviewed. All of the studies included in the review compared polygynous families with monogamous families using quantitative methods and inferential statistical analyses.

### *Cultural context and demographic variables*

Research included in the review was conducted in a limited range of countries and cultures (see Table 1). The most frequently occurring culture was Bedouin-Arab and Arab Muslim (n = 10). Others were United Arab Emirates (n = 1), South Africa (n = 1) and Nigeria (n = 1). The age range of children was between 6 and 18 years. All of the papers included males and females in the sample.

Although the majority of the studies provided some background information about the cultural and economic context of polygyny for the study population, information about the specific sample was not always reported. Comparisons between parental education and income or employment were carried out in 7 of the 13 studies. Statistically significant differences for fathers' education were found in 5 studies, with lower levels and/or fewer years of education found for polygynous fathers than monogamous fathers (Al-Krenawi et al, 2002; Al-Krenawi & Lightman, 2000; Al-Krenawi & Slonim-Nevo, 2008; Elbedour, Bart & Hektner, 2003; Hamdan, Auerbach & Apter, 2009). Two studies found no significant differences in father education between polygynous and monogamous families (Bamgbade, & Saloviita, 2014; Elbedour, Hektner, Morad & Abu-Bader, 2003). The remaining 6 papers did not report the fathers' education history separately.

Maternal education was reported as being lower level and/or fewer years in monogamous than polygynous families in 3 studies (Al-Krenawi, et al, 2002; Al-Krenawi & Slonim-Nevo, 2008; Hamdan et al, 2009). One paper reported that none of the mothers had attended school (Al-Krenawi & Lightman, 2000). The remaining 9 papers did not report the mother's education.

Three studies reported that family income and/or parental employment was lower in polygynous than monogamous families (Al-Krenawi et al, 2002; Al-Krenawi & Slonim-Nevo, 2008, Hamden et al, 2009), two reported no differences in the range of occupations

(Al-Krenawi & Lightman, 2000; Bamgbade & Saloviita, 2014) and the remaining 8 papers did not report extractable information to compare family income/occupations. This lack of consistency in reports of parental education and income creates difficulties for proposing these variables as influential variables for child and adolescent outcomes.

*Table 1 about here*

### ***Dependent variables***

The research papers included in the review investigated a wide range of dependent variables. The dependent variables and the number of studies using each dependent variable was as follows: psychological health and well-being (i.e., mental health symptoms, externalizing problems, internalizing problems, self-esteem),  $n = 7$  (reported in 6 papers); academic/ educational achievement,  $n = 7$ ; and a range of other variables including attitudes towards polygyny ( $n = 1$ ), family function/dysfunction ( $n = 2$ ), school adjustment ( $n = 1$ ), family conflicts ( $n = 1$ ), social functioning ( $n = 1$ ), father-child relationship ( $n = 1$ ), mother-child relationship ( $n = 1$ ), corporal punishment ( $n = 1$ ), learning disorder ( $n = 1$ ), intelligence ( $n = 1$ ), family cohesion ( $n = 1$ ), exposure to violent events ( $n = 1$ ), parent-adolescent conflict ( $n = 1$ ). Overall, the most frequently measured dependent variables were those concerned with psychological health/ well-being and academic achievement.

### ***Psychological health and well-being outcomes***

As can be seen in Table 2, children and adolescents from polygynous families had higher levels on a range of psychopathological symptoms than those from monogamous families in 5 papers (Al-Krenawi et al., 2002; Al-Krenawi & Slonim-Nevo, 2008; Eapen et al, 1998; Elbedour et al., 2003; Elbedour et al., 2007). This included ‘mental health problems’, obsessive compulsive symptoms (2 studies), paranoid ideation (2 studies), depression (2 studies), hostility, phobic anxiety, psychoticism, acute affective disorders, externalizing problems, social difficulties, attention problems and delinquent problems. These symptoms

were associated with other variables in 3 studies; family dysfunction, lower family cohesion and violence in the home. These were reported in Al-Krenawi et al. (2002) and two studies in Elbedour et al (2007). The number of wives in polygynous families may be important. Children from families with 3 or 4 wives (but not 2 wives) differed from those from monogamous families in the only paper to examine this factor (Elbedour, Bart and Hektner, 2007).

However, children and adolescents from monogamous and polygynous families did not differ on 'internalizing problems' (2 studies), anxiety (5 studies), hostility (2 studies), and teacher reports of problem behaviours (Al-Krenawi et al, 2002; Al-Krenawi & Slomin-Nevo, 2008; Elbedour et al, 2007; Elbedour et al, 2003; Hamdan et al, 2009). Conflicting results were found for depression, with 2 studies reporting significantly higher levels of depression for young people from polygynous families (Al-Krenawi, et al, 2002; Al-Krenawi & Slomin-Nevo, 2008) and 2 studies reporting no significant differences (Elbedour et al., 2003; Hamden et al, 2009). Also, conflicting results were found for self-esteem. Adolescents from polygynous families were found to have lower self-esteem than those from monogamous families in one study (Al-Krenawi, et al, 2002) and no differences were found in 2 studies (Al-Krenawi & Slomin-Nevo, 2008; Elbedour et al, 2007).

In summary, there were more statistically non-significant ( $n = 22$ ) than significant differences ( $n = 17$ ) between young people from polygynous and monogamous families reported. However, the differences found were all in the same direction, showing more mental health problems experienced by young people from polygynous families than monogamous families. None of the papers included in the review found more mental health problems experienced by young people from monogamous families when compared to those from polygynous families.

*Table 2 about here*

***Academic/ educational achievement***

Table 3 shows that academic achievement as measured by examination results or school reports was found to be lower among children from polygynous families than monogamous families in 3 of the 7 studies reporting on this variable (Al-Krenawi & Lightman, 2000; Al-Krenawi & Slomin-Nevo, 2008; Elbedour, Onwuegbuzie & Alatamin, 2003). This only affected adolescent girls with 3 or 4 mothers in one study (Elbedour et al., 2000). Also, no statistically significant differences were found for self-reported academic achievement. Children from polygynous families self-reported lower understanding of academic subjects than those from monogamous families in Bamgbade and Saloviita's (2014) research. Cherian's (1994) research reported that corporal punishment negatively affected the academic achievement of children from polygynous and monogamous homes equally, except for girls from polygynous homes.

***Learning disorder and intelligence***

Two studies considered the effects of polygyny on learning disorder and intelligence (Eapen et al, 1998; Elbedour, Bart & Hektner, 2003). No statistically significant differences were found between children from polygynous and monogamous households in learning disorder or intelligence (Table 3). However, adolescents from two-wife families had significantly lower intelligence scores than those from three- or four-wife families and those from one-wife families. This was explained by the significantly lower level of fathers' education in this group (Elbedour et al, 2003).

*Table 3 about here*

### ***Social problems***

Differences were found between young people from polygynous and monogamous families on a range of social problems (see Table 4). Compared to adolescents from monogamous families, adolescents from polygynous families reported higher levels of family dysfunction (Al-Krenawi et al, 2002; Al-Krenawi & Slonim-Nevo, 2008), lower family cohesion (Elbedour et al, 2007), worse relationships with their father (Al-Krenawi & Slonim-Nevo, 2008), more sibling conflicts (Al-Krenawi & Lightman, 2000), worse relationships with friends (Al-Krenawi & Slonim-Nevo, 2008) lower adjustment to the school system and to the society of other children (Al-Krenawi & Lightman, 2000). No differences were found in adjustment to classroom norms, conflict management style, conflicts between children and parents (Al-Krenawi & Lightman, 2000; Elbedour et al, 2003) or conflicts between parents (Al-Krenawi & Lightman, 2000). Also, young people from monogamous families reported that they experienced more violence in school (Elbedour et al, 2007) and held more positive attitudes towards polygyny than those from polygynous families (Al-Krenawi et al., 2006). In summary, there were more problem areas for participants from polygynous families than monogamous families, however, there were several similarities.

*Table 4 about here*

### ***Mediating variables***

Although parental income and education were identified as important and potential mediating variables by studies included in this review, only 5 studies investigated potentially confounding variables and mediating variables directly. For example, Al-Krenawi et al (2002) investigated the role of father's education, socioeconomic status and family functioning associated with polygyny using MANOVA and regression analysis. They found that polygyny affected their participants' mental health indirectly through its association with father's education and socioeconomic status. Also, they reported that family functioning was

the best predictor of mental health for their sample of adolescents. Using regression analysis, Al-Krenawi and Slonim-Nevo (2008) found that family functioning mediated the effects of family structure on children's peer relations, self-esteem and mental health. They suggested that polygyny in itself is not detrimental to children, but that what is important is how well-functioning the family is. Also, they found that economic status was a significant predictor of both family functioning and children's mental health; children fared better in polygynous families whose economic status was good.

Elbedour et al (2000) found gender differences in academic achievement of children from polygynous families – with boys scoring higher than girls in one of the four academic subjects they tested. Elbedour et al (2003) found no significant effects of family structure, parental sanguinity and father's education on adolescents' intelligence scores. However, when they calculated the cumulative effects of the risk factors of family structure, parental relatedness and father's education, they found a significant correlation between these risk factors and intelligence scores. Adolescents with all three risk factors had lower scores than those with zero, one or two risk factors. This implies that it is only when polygyny was combined with low levels of paternal education and high levels of relatedness between parents that the detrimental effects were seen on intelligence scores. Elbedour et al (2007) found that family cohesion and violence in the home were correlated with more mental health variables for adolescents from polygynous than monogamous families.

### ***Quality assessment***

Quality characteristics of the comparison studies can be found in Tables 2 - 4. The majority of studies (n = 8) used previously published psychological measures that were originally devised for use in other cultural settings. Authors reported psychometric properties relevant to the sample (such as internal consistency) in 7 of these 8 studies. Also, evidence of cultural

relevance and/or validity reported in previous published research was highlighted in 3 of these studies. In 3 studies, at least one of the instruments had been designed by the authors for the specific sample being studied; psychometric properties reported included face validity and internal consistency. In the studies that used pre-existing measures originally designed in other languages, back-translation was clearly specified in 4 studies. In 2 studies, the process of translation was carefully described but it was not stated clearly whether back-translation had been used. In the remaining 2 studies, the process of translation was not reported.

Sampling biases and limitations discussed by the authors included in this review were as follows. Random selection of participants was difficult in these studies because of the requirement for a specific type of sample, hence sampling of participants varied across studies, including random sampling from all high schools in the area (Elbedour et al, 2000), random sampling (Elbedour et al, 2003, 2007; Al-Krenawi & Slonim-Nevo, 2008) stratified random sampling (Cherian, 1994; Eapen et al, 1998), random selection of schools only (Al-Krenawi & Lightman, 2000; Elbedour et al, 2000), random selection of school classes (Bamgbade & Solviita, 2014) and convenience sampling (Al-Krenawi et al, 2006; Al-Krenawi et al, 2002; Elbedour, Bart & Hektner, 2003; Hamdan et al, 2009). Variables that were controlled or included as an independent variable included the number of wives in polygynous families and the position of the respondent in the family (e.g., child of the first wife) (Al-Krenawi & Lightman, 2000; Al-Krenawi et al, 2002; Al-Krenawi & Slonim-Nevo, 2008; Elbedour, Bart & Hektner, 2003, 2007; Elbedour, Hektner, Mora & Abu-Bader, 2003; Hamdan et al, 2009).

## **Discussion**

Most of the research included in this review supports the view that polygyny has detrimental effects on children and adolescents. When compared to children from monogamous families,

children or adolescents from polygynous families had a variety of problems such as mental health disorders, scholastic difficulties and social problems. However, there were several similarities found, including self-esteem, anxiety, depression, hostility, teacher reports of problem behaviours, learning disorders. None of the studies included in this review reported benefits of polygyny for children and only one study found more negative outcomes for children from monogamous families. This is in contrast to earlier research (e.g., Swanson, Massey & Payne, 1972, Owuamanam, 1984), not included in this review, that suggested potential benefits of polygyny to children's social functioning.

Several studies in this review reported that socioeconomic status in polygynous families tended to be lower than in monogamous families as indicated by parental education, parental income and parental employment. In these studies father's educational and income levels were seen as factors that predispose men to marry more than one wife, consequently compounding the economic strains on the family (e.g., Al-Krenawi et al., 2002; Al-Krenawi & Slonim-Nevo, 2008). Lower levels of parental education, employment and income can be seen as indicators of financial stress which in itself can have detrimental effects on children's well-being in monogamous as well as polygynous families (Duncan & Brooks-Gunn, 2000; Elbedour et al., 2002). However, few researchers investigated these potential mediating variables. Those that did investigate mediating variables found that polygyny had an indirect effect on children's outcomes through the mediating variable of family economic status and that children's outcomes were improved in polygynous families whose economic status was good (Al-Krenawi et al, 2002; Al-Krenawi & Slonim-Nevo, 2008). The role of socioeconomic status in relation to the negative effects of polygyny on children and adolescents needs further investigation.

Elbedour et al (2003) commented that research on the effects of polygyny on children and adolescents is limited by an over-reliance on the single factor of family structure in the

design of research studies. Although the majority of studies included in this review followed this type of research design, some investigated potential mediating variables. In addition to the effects of paternal education and income discussed above, family functioning (Al-Krenawi and Slonim-Nevo, 2008), family cohesion and violence in the home (Elbedour et al, 2007) were found to influence children's peer relations, self-esteem and mental health. Al-Krenawi and Slonim-Nevo (2008) suggested that polygyny in itself is not detrimental to children, but what is important is how well-functioning the family is. Also, Elbedour et al (2003) reported on the detrimental effects of accumulated risk factors associated with polygyny, such as parental relatedness and low levels of parental education. These findings led them to conclude that family structure alone is inadequate for explaining the effects of polygyny on children and that there is a need for further research that will evaluate the effects of mediating and moderating factors within the family. For example, other potential mediating variables that need further investigation include the extent of the father's involvement with the family, the amount of time he spends with the family, and whether parents experience any negative effects of polygyny.

Further research is needed on whether boys and girls are affected differently. Among the few studies that found gender differences, Cherian (1994) found that boys and girls in polygynous families were affected differently by corporal punishment, Elbedour et al (2000) found gender differences in achievement in one academic subject and Al-Krenawi et al (2006) found gender differences in attitudes towards polygyny. As the experience of polygyny is different for men and women, it would be interesting to determine the extent of gender differences in the experiences of polygyny during childhood.

Although the age range of participants included in this review ranged from 6 years to 18 years, comparisons between children of different ages or between children and adolescents was given little research attention. Elbedour et al (2000) suggested that detrimental effects of

polygyny might be more noticeable in childhood and disappear as children get older. This review provided no evidence to support this suggestion. The few studies that focussed on younger children (e.g., Al-Krenawi & Lightman, 2000) found a similar pattern of results to those of adolescents. Given the paucity of cross-sectional studies comparing age groups or longitudinal studies considering effects over time, we agree with Elbedour et al (2000) that the impact of polygamy across the course of development requires further empirical attention.

Family size and the position of the mother within the family is an important variable affecting women in polygynous relationships (Shepard, 2012). To what extent it affects children is relevant to this review. Some of the studies included children of first wives in two-wife families which controls for family size but could limit the ability to generalise to the wider range of children in polygynous families (Al-Krenwai et al, 2002; Al-Krenwai & Lightman, 2000; Al-Krenwai & Slomin-Nevo, 2008). Other studies did not control for family size or family position of the mother. Only 2 studies included family size or position of the mother in the family as a variable (Elbedour, Bart & Hektner, 2003; Elbedour et al, 2007). Given that the position of the mother in the family can affect her status and psychological well-being (Al-Shamsi & Fulcher, 2005; Al-Krenwai & Slonim-Nevo, 2008), the effects of this variable on children need more careful study.

Limitations of this review were as follows. The studies included in the review used a range of different tests and scales making it difficult to draw any strong conclusions about specific effects or to conduct a meta-analysis. All of the research included in this review was cross-sectional. It is not known whether children had problems before the father married again or developed them afterwards. Longitudinal research is needed to address this issue.

Also, the cultural context is important, how widely polygyny is practised in the community and how well it is accepted may influence the type of effects on children.

Previous authors, e.g., Elbedour et al (2002) have stated that the effects of any polygamous family stressors on child outcomes will be ameliorated in communities where the practice of polygamy is permitted and/or valued. The majority of studies included in the review were conducted in Arabic and Muslim communities. Polygyny is permitted in Islamic *Shariah* law under particular condition, such as infertility and ill health of the wife, also where there is a high rate of single women and widows (Al-Shamsi & Fulcher, 2005; Al-Krenawi, 2014; Rehman, 2007). There is an expectation that the polygynous father must be fair with his wives and children in order to have a positive impact on family members (Bewley and Bewley, 1999). As this review focussed on children, the extent to which fathers were able to achieve the expectations of fairness and the extent to which this would affect child outcomes needs further investigation or review.

An important limitation of this review is that the majority of the studies (10 out of 13) were conducted in the same local culture, Arab-Bedouin society. Comparisons between the 2 studies from sub-Saharan Africa and those from the Arabic cultures (10 Bedouin Arab and 1 UAE) found that paternal education and occupation tended to be lower in polygynous than monogamous families in the majority of Arabic culture studies but not in the sub-Saharan African studies. Also, polygamy had negative effects on academic achievement among the Arabic culture studies. This was less evident for the studies from other cultural contexts. For example, the Nigerian school students from polygamous families reported more difficulties in mathematics and English but this did not appear to directly affect their exam results. No differences were found for exam results in the Nigerian sample of students from monogamous and polygamous families. The South African study reported interactions between family structure, gender and corporal punishment in their effects on academic achievement. There is a need for future studies to include a wider range of cultural contexts, in Africa, Asia and the CCG (Gulf Co-operation Council) countries. This will allow for

comparisons of important variables, such as family economics, parental education levels, religion, cultural traditions, attitudes and acceptability in the community.

In conclusion, the research included in this review found that polygyny has a wide range of detrimental effects on children. However, similarities between children in polygynous and monogamous families should not be overlooked. Given that polygyny is permitted in many countries and cultures, further research is needed on the effects of this type of family structure on children. In particular, further investigation of the role of mediating variables, both positive and negative, is needed.

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Table 1

Comparisons between polygynous and monogamous families: authors, cultural settings, participant characteristics and sample size

<b>Authors &amp; Cultural setting</b>	<b>Participant characteristics &amp; sample size</b>
Al-Krenawi, Graham & Ben-Shimol-Jacobsen (2006), Bedouin Arab (Negev, Israel)	145 school students (mean age = 17 years), 57 'older' participants (mean age = 61.3 years), 68 participants from polygynous families.
Al-Krenawi, Graham, Slonim-Nevo (2002), Arab Muslim (Israel)	19 from first of 2 wives in polygynous families (mean age 12.79 years); 82 from monogamous families (mean age 13.01 years)
Al-Krenawi & Lightman (2000) Bedouin Arab (Negev)	73 children from senior of 2 wives in polygynous families, 73 children from monogamous families, age 8 – 9 years.
Al-Krenawi & Slomin-Nevo (2008) Bedouin Arab (Negev, Israel)	178 of first of 2 wives in polygynous families, 174 from monogamous families, age range 13-15 years.
Bamgbade & Saloviita (2014) Nigeria (Yoruba, Igbo, Hausa)	50 children from polygynous families, 156 from monogamous families, 12-15 years.
Cherian (1994) South Africa, Xhosa	114 children from polygynous families, 881 children from monogamous families, age 13-17 years.
Eapen, Al-Gazali, Bin-Othman & Abou-Saleh (1998) United Arab Emirates	199 children from polygynous and monogamous families (numbers of each not specified), mean age 9.9 years, age range 6-15 years.
Elbedour, Bart & Hektner (2000) Bedouin Arab (Negev)	95 adolescents from polygynous families, 140 from monogamous families, age not reported, school grades 10-12.
Elbedour, Bart & Hektner (2003) Bedouin Arab	84 from monogamous families, 114 from polygynous families (number of wives ranged from 2 to 4), mean age 15.9 years.
Elbedour, Bart & Hektner (2007) Bedouin Arab (Negev, Israel)	Study 1 = 210 respondents; 114 from polygynous families & 96 monogamous families, mean age = 15.9 years. Study 2 = 182 respondents; 68 from polygynous & 114 from monogamous families, age 13.5-18.5 years
Elbedour, Hektner, Morad & Abu-Bader (2003) Bedouin Arab (Negev, Israel)	129 respondents from monogamous families and 83 from polygynous families (2 wives), age not reported, school grades 10-12.
Elbedour, Onwuegbuzie & Alatamin (2003) Bedouin-Arab (Negev, Israel)	102 children from polygynous families (2 wives) and 153 from monogamous families, age range 8 – 13 years, mode = 9 years,
Hamdan, Auerbach & Apter (2009) Bedouin Arab (Negev, Israel)	239 adolescents from polygynous families, 219 adolescents from monogamous families, age 11-18 years.

Table 2

Comparisons between polygynous (P) and monogamous (M) families for mental health variables

<b>Authors</b>	<b>Dependent variables</b>	<b>Main significant findings</b>	<b>Main non-significant findings</b>
Al-Krenawi, et al (2002)	Self-esteem (Rosenberg SE scale, alpha = 0.50), mental health symptoms (Brief Symptom Inventory, alpha = 0.77). All tests translated from English to Arabic, back-translation not specified	Respondents from P families had lower self-esteem scores, higher scores for obsessive compulsive symptoms, depression, paranoid ideation and interpersonal sensitivity (all $p < 0.05$ ). The strongest predictor of mental health was family functioning ( $p < 0.001$ ).	No statistically significant differences for General Severity Index, anxiety, hostility, phobic anxiety and psychoticism.
Al-Krenawi & Slomin-Nevo (2008)	Self-esteem (Rosenberg SE scale, alpha = 0.81), mental health symptoms (Brief Symptom Inventory, alpha = 0.94). Back-translation used for all instruments.	Respondents from P families reported more mental health problems ( $p < 0.001$ ), including depression, somatization, and hostility (all $p < 0.01$ ), obsession compulsion, interpersonal sensitivity, phobic anxiety (panic) and psychoticism (all $p < 0.001$ ), and paranoid ideation ( $p < 0.05$ ) than those from M families.	No statistically significant differences found for self-esteem and anxiety.
Eapen et al (1998)	Mood, anxiety, disruptive, conduct, attention, elimination and other disorders (clinical interviews using K-SADS-P following initial screening, reliability and validity for sample not reported). Clinical interviews conducted by local child psychiatrists. Translation not reported.	Significant correlation between DSM-IV disorders (not individually specified) requiring treatment and polygamy ( $p < .05$ )	
Elbedour et al (2007)	Self-esteem (Arabic version of Coopersmith SE Inventory, alpha = 0.69), mental health: general, anxiety, depression, hostility (Derogatis Symptom Checklist, alpha = 0.72-0.97; What I Think and Feel (alpha 0.91). Teacher reports of problem behaviours (Achenbach Child Behaviour Checklist, alpha = 0.58 - 0.80). Back-translation used for all instruments, local professional psychologists checked the cultural validity of the instruments, cultural validity of the instruments described.	Adolescents from M families reported lower levels of psychopathological symptoms than adolescents from families with 3 or 4 wives, but not those with 2 wives ( $p < 0.05$ , small effect size). Family cohesion was significantly associated with more symptoms for adolescents from polygynous than M families ( $p < 0.01$ ). Violence in the home was negatively correlated with self-esteem ( $p < 0.05$ ) and positively correlated with all psychopathology scales for the P group only ( $p < 0.01$ ).	No statistically significant differences between adolescents from polygynous and monogamous families in self-esteem, anxiety, depression and hostility. No difference between groups in the relationship between parental education level and symptoms. No statistically significant differences between adolescents from polygynous and monogamous families in teacher reports of problem behaviours and anxiety.
Elbedour, Onwuegbuzie & Alatamin (2003)	Internalizing behaviour problems: withdrawn, somatic complaints, anxious/depressed Externalizing behaviour problems: delinquency, aggression, attention problems (Teacher's report form from Achenbach Child Behaviour Checklist, alpha = 0.88 for internalizing behaviours, alpha = 0.94 for externalizing behaviours). Back-translation used and standardized for use with Bedouin-Arab children.	Higher levels of externalizing problems found in two-wife families than one-wife families ( $p < 0.001$ ), although below the clinical range. The more externalizing problems displayed, the more likely the child was to come from a two-wife family ( $p < 0.01$ ). Higher levels of attention problems and delinquent problems (both $p < 0.001$ ) in two-wife than one-wife families, although below the clinical range. The more attention problems displayed, the more likely the child was to have come from a two-wife family ( $p < 0.05$ )	No statistically significant differences between children from two-wife and monogamous families in internalizing problems.
Hamdan et al (2009)	Self-reported behavioural problems (Achenbach Youth Self-Report, alpha = 0.91) Anxiety (Revised Children's Manifest Anxiety Scale (alpha = 0.88), Depression (Children's Depression Inventory, alpha = 0.82). Back translation used for all instruments.		No significant differences between adolescents from polygynous and monogamous families for any of the dependent variables.

Table 3

Comparisons between polygynous (P) and monogamous (M) families for intelligence, academic achievement, learning disorders

Authors	Dependent variables	Main significant findings	Main non-significant findings
Al-Krenawi et al (2002)	Self-reported academic achievement, tna.		No statistically significant differences between children from P and M families.
Al-Krenawi & Lightman (2000)	Achievement scores in 4 school subjects, tna	Children from M families scored higher than children from P families ( $p < 0.01$ ).	
Al-Krenawi & Slomin-Nevo (2008)	Academic achievement in 4 school subjects, tna	Adolescents from P families had poorer school achievement than those from M families ( $p < 0.05$ ).	
Bamgbade & Saloviita (2014)	Academic achievement in national examinations, self-reported difficulties in understanding Mathematics & English, tna	Children from P families reported more difficulties in understanding Maths ( $p = 0.001$ ) and English ( $p = 0.037$ )	No statistically significant differences in national examination results.
Cherian (1994)	Academic achievement in Department of Education examinations, tna	Academic achievement of boys in P families were negatively affected by corporal punishment ( $p < 0.01$ ), boys and girls in M families were negatively affected by corporal punishment ( $p < 0.01$ ).	
Eapen et al (1998)	Learning disorders (clinical interviews, tna).		No statistically significant effect of polygamy on learning disorders
Elbedour et al (2000)	Achievement scores in 4 school subjects, alpha = 0.75, tna	Significant interaction between adolescent gender and number of mothers – girls with 3 or 4 mothers had the lowest mean score and boys who lived with 3 or 4 mothers had the highest mean score ( $p < 0.01$ ) in one school subject.	No statistically significant differences in achievement scores. No statistically significant effect of number of mothers on achievement scores.
Elbedour, Bart & Hektner (2003)	Intelligence (Shortened version of Raven's progressive Matrices, split half reliability = 0.84, translation not reported).	Respondents from families with 2 wives had significantly lower intelligence scores than all other respondents ( $p < 0.05$ ).	
Elbedour, Onwuegbuzie & Alatamin (2003)	Educational achievement in 10 school subjects, tna. Teacher ratings, tna	Lower overall academic achievement in two-wife families than one-wife families ( $p < 0.01$ )	No statistically significant differences for teacher ratings.

(tna = translation not applicable)

Table 4

Comparisons between polygynous (P) and monogamous (M) families for social variables and social problems

<b>Authors</b>	<b>Dependent variables</b>	<b>Main significant findings</b>	<b>Main non-significant findings</b>
Al-Krenawi et al (2006)	Attitudes towards polygamy (designed and administered in participants' language, alpha = 0.97)	Participants from M families had more positive attitudes towards polygamy than those from P families ( $p < 0.01$ ).	
Al-Krenawi et al (2002)	Family functioning / dysfunction (McMaster Family Assessment Device, alpha = 0.63, test-retest reliability good, validity good when compared to other measures, back-translation not specified)	Children from P families had higher levels of family dysfunction than children from M families ( $p < 0.05$ ).	
Al-Krenawi & Lightman (2000)	Social adjustment in school (Adjustment to School System questionnaire, translated in consultation with school teachers, good face validity) Family conflicts (Family Conflict Questionnaire, translation not applicable, good face validity)	Children from P families scored lower than children from M families on adjustment to the school system ( $p = 0.013$ ) and to the society of other children ( $p < 0.004$ ). Children from P families reported more conflicts with their siblings than children from M families ( $p < 0.01$ ).	No statistically significant differences found between groups on measures of adjustment to class norms. No differences between groups on conflicts between children and parents or between parents.
Al-Krenawi & Slomin-Nevo (2008)	Relationships with friends (back translation, alpha = 0.89) Family functioning (McMaster Family Functioning, back translation) Father-child relationship (alpha = 0.71, back translation used) Mother-child relationship (alpha = 0.84, back translation used)	Adolescents from P families reported poorer relationships with friends than those from M families ( $p < 0.01$ ), poorer family functioning ( $p < 0.01$ ), poorer relationships with their father ( $p < 0.001$ )	No differences found for relationships with their mother.
Elbedour et al (2007)	Family cohesion (Cohesion subscale of Moos Family Environment Scale, alpha = 0.63, back translation) Exposure to violent events (Assessment of Children's Exposure to Violent Events, alpha 0.80 – 0.84, back translation used)	Adolescents from M families reported higher perceptions of family cohesion ( $p < 0.01$ ) and more violence in their schools ( $p < 0.01$ ) than adolescents from P families	
Elbedour, Hektner, Morad & Abu-Bader (2003)	Parent-adolescent conflict		No significant differences in number of conflicts or conflict management style between respondents from P and M families.