1. **Abstract**

**Background:***Studies have shown a link between parenting children with intellectual disabilities and parental distress. Psychosocial interventions for the parents are available but there are few systematic reviews of the evidence from these studies and how they relate to low income settings (developing or transitional countries).*

**Research Objectives:***We aim to review the importance of psychosocial interventions on psychological health among parents of children having intellectual disabilities and discuss the challenges in implementation of these psychological interventions in low income settings.*

**Methodology:** *We did a systematic literature review from 1999 to 2016 using electronic databases, citation tracking, snowball searching as well as recommendations from experts. Exclusion factors included studies not done in English language; those not focused on psychosocial interventions and studies with less than a 50% follow-up rate. Data extraction included; study site, population, intervention, psychological outcome measures assessed, efficacy of intervention and an assessment of the quality of the study.*

***Findings:*** *The search identified 1,063 titles. After extraction these were reduced to 21 articles. The interventions have also shown effectiveness in improving parental psychological and general wellbeing, as well as overall quality of life.*

***Conclusion:*** *Studies from high income settings demonstrate evidence that psychosocial intervention can improve psychological outcomes among the parents of children with these disabilities. There is also evidence to demonstrate how these interventions can improve the parents’ general wellbeing and their overall quality of life. Few robust studies have been conducted in low income settings as yet.*

# Introduction

The Global burden of disease report (2004) projected that more than 100 million children aged below 15 years had intellectual disabilities. It is said that 85% of these children stay in developing countries, with limited to no disability service access ([Helander, 1993](#_ENREF_29)). The majority of these children, as well as their parents, suffer greatly as a result of the disability and its associated stigmatization, often leading to marginalisation.

Disability prevalence estimates in resource poor countries are typically high ([Zaman, Khan, & Islam, 1992](#_ENREF_62)). Studies done in Kenya reported a prevalence of neurological disability of 9.3% in children ([V. Mung'ala-Odera et al., 2004](#_ENREF_38); [V Mung'ala-Odera et al., 2006](#_ENREF_39)). In a latest Key Informant study, 31% percent of children, screened in Malawi, had at least one disability. Of these screened children, 14% had numerous impairments while 26% had intellectual disabilities ([Tataryn et al., 2015](#_ENREF_56)).

The relationship between care-giving for these children and poor health outcomes for their parents has been studied in the developed world. Studies have demonstrated that carers for intellectually disabled children experience additional psychological distress and depression compared to the parents of normal children ([Dykens, Fisher, Taylor, Lambert, & Miodrag, 2014](#_ENREF_13) ; [Emerson, 2005](#_ENREF_14); [R. P. Hastings & Beck, 2004](#_ENREF_28)). Much of this distress is related to stigma and cultural misconceptions about disability and its causes. Some studies have also reported negative outcomes among the carers like physical problems, social, as well as financial issues for the child’s family ([Witt, Riley, & Coiro, 2003](#_ENREF_60); [Wolfensberger, 1969](#_ENREF_61)). This often leads to marital breakdowns and divorce ([Gath, 1977](#_ENREF_21); [Schwartz & Tsumi, 2003](#_ENREF_50)). In low income settings this may even lead to child protection issues.

There is also evidence from the literature, that mothers of intellectually disabled children show more psychological problems compared to other members in their family, because they are often the primary caregivers for the child ([Pelchat, Lefebvere, & Perreault, 2003](#_ENREF_42); [Weiss, Sullivan, & Diamond, 2003](#_ENREF_58)). Fathers, on the other hand, do not experience similar damaging psychological issues. This could be attributed to differences in responsibilities assigned to child rearing, because fathers are less involved in the child caregiving activities ([Moes, Koegel, Shreibman, & Loos, 1992](#_ENREF_37)).

Traditional studies have found that caring for disabled children has adverse psychological impact on their parents, but latest studies show that these impacts could be resolved with psycho-social interventions ([Risdall & Singer, 2004](#_ENREF_45)). One longitudinal study, reported no differences between carers of intellectually disabled children and those without in relation to their physical as well as emotional health ([Seltzer, Greenberg, & Floyd, 2001](#_ENREF_51)).

In the absence of a cure for most disabilities, some psycho-social interventions have shown effectiveness in helping parents of intellectually disabled children to cope positively in their daily distressing caregiving roles ([Glidden & Jobe, 2006](#_ENREF_23); [Gona., Newton, Hartley, & Bunning, 2013](#_ENREF_25))

In this article, we aim to review the impacts of psychosocial interventions on psychological wellbeing among parents of children having various intellectual disabilities and discuss the challenges in implementation of those psychological interventions in low income settings. Against this background we conclude with recommendations for future research to inform the development of effective and culturally responsive psycho-social interventions for parents of intellectually disabled children. For the purposes of this paper, the interventions are organized according to their context (high income country interventions versus those studied in low to middle income settings), type (group interventions versus individual interventions) and child’s age.

1. **Methods**

This study was registered under PROSPERO registration number CRD42016037614.

Data sources and search period: We conducted a review of literature published from 1999-2016. We searched databases including Pubmed, Biomed Central, Cochrane database, PsycINFO, the cumulative Index to Nursing and the allied Health Literature (CINAHL), ERIC and Google Scholar from March 2014 to December 2016. We also snowball searched the literature from relevant citations in reviews and articles. Experts were contacted to ask for details of other studies done in low to middle income countries for example Gona’s work in Kenya. The search strategy included the single as well as combined terms; ‘Psychological distress’, ‘Mental Health,’; ‘Mental handicap’, ‘Downs syndrome,’ ‘Fragile X,’ ‘Developmental retardation,’ AND ‘Developmental disability’, ‘Mental retardation’ ‘Learning disability,’ ‘Intellectual disability’, ‘Children’, ‘Low to middle income country’ which were then paired with; ‘Psychosocial education’ and ‘Parents’ education’.

Study selection: The main author (CM) and another independent reviewer (TB) were involved in the selection process of the articles using forms and had a 100% agreement on number of articles to be included in the final review. Inclusion criteria involved studies evaluating psychosocial interventions (non-pharmacologic maneuvers intended to alter a person’s environment or a person’s perception to lessen the impact of a mental health problem) for parents of intellectually disabled children. The PICO model was used with P: parents of intellectually disabled children; I: psychosocial interventions; C: group versus individual interventions O: Psychological distress. Intellectual disabilities have been defined as those categorized by limitations in intellectual functioning as well as in adaptive behaviors for daily social as well as in practical skills, starting below 18 years of age ([AAIDD., 2013](#_ENREF_1)). For the purpose of this review, studies on other developmental disorders including autism were also included. Exclusion factors included studies restricted to parents younger than 16 years; those not written in English languages, those not focusing on psychosocial interventions for parents of intellectually disabled children, as well as the studies with an attrition rate of above 50%.

Considering the small number of studies that we identified, the differences in the interventions and outcomes used, and the lack of detailed descriptive statistics in most articles, the GRADE criteria for checking quality of systematic reviews could not be used. Alternatively, each study was summarized as shown in Table 1 together with the descriptive analysis of the studies in text.

Data extraction: Psychological outcome measures were selected as the primary outcome variable because of their relationship with the study objective. These included depression, anxiety, and stress or psychological distress (DASS). Secondary outcome variables included parents’ resilience, quality of life, parental attitudes and knowledge of disability, communication between parents and their children’s behaviour and development. These were considered secondary as they were distant from the core outcome variable for this review. Data on both primary and secondary outcomes were excluded if they were collected using scales that are not validated.

1. Results

The initial search identified 1,063 titles as follows: Pubmed (539), Biomed Central (449), Cochrane database (13) and the Cumulative Index to Nursing PsycINFO (11), ERIC (9) and the Allied Health Literature (CINAHL) (42). Out of these, 957 were research articles with abstracts. After including only studies looking at psychosocial interventions for parents of intellectually disabled children, by review initially for titles and then for the abstracts, 21 articles were discovered. Ten articles were from high income countries with the remaining from low to medium income countries (nations with a per capita gross income of $1,045 -$12,615 according to World Bank Atlas) ([Group, 2015](#_ENREF_26) ). Nine of these were intervention studies, while the other nine were not. Studies had at least one primary outcome variable for parents which included depression, anxiety, and stress or psychological distress. Figure 1 gives an overview of all reviewed studies.

**Figure 1:**

## Part One: Intervention studies from high income settings

Randomized clinical trials with depression, anxiety and stress outcomes

***Programs for parents of school aged children***

A number of randomized clinical trialshave looked at the effects of psychosocial interventions on parental mental health outcomes. One of the few trials conducted on psychological interventions for mothers of intellectually disabled children was a robust randomized controlled trial (pre- and posttest control group design) from Australia utilizing the ‘**Sign Post’ group training program**. This team locally adapted the intervention which included three modes of support: group support (intervention administered to a groups of parents at a center), telephone support (intervention offered using phone-based education) and self-directed support ([Hudson, Mathew, & Gavidia–Pague, 2003](#_ENREF_31)). The study measured outcomes at 4-6 months of child’s age. The study demonstrated that mothers belonging to the experimental arm had reduced levels of anxiety, stress as well as depression. Although randomization prevented some bias in the study there was substantial dropout from the groups exposed to the sign post materials.

A much larger American study more specifically for children with autism (averaging 10 years of age) recently randomized mothers into either **Mindfulness-Based Stress Reduction** or **Positive Adult Development** (evidence based intervention from positive psychology) ([Dykens et al., 2014](#_ENREF_13) ). These interventions were brief; lasting only six weeks in both groups provided in a 1.5-hour weekly session. Despite this both interventions led to significant reductions in stress when screened ([Abidin, 1995](#_ENREF_2)), and ‘beck depression inventory manual’ ([Beck, Steer, & Brown, 1996](#_ENREF_10)). Mothers also had an improved sleep pattern and life satisfaction. Furthermore, the mothers in Mindfulness-Based Stress Reduction had greater improvements in almost all outcome measures than those in the Positive Adult Development.

{Beck AT, 1993 #151}Another large study of 122 low-income mothers used a **Problem-Solving Education (PSE),** with mothers having children with Autism, averaging 34 months. This PSE is a group intervention which aims at decreasing parental stress and depressive symptoms. It is administered, through 6 sessions, immediately after diagnosis of autism spectrum disorder. The PSE was compared with clinical treatment as usual for children with autism. It was found that mothers PSE group were less likely than the controls to experience clinical parental stress ([Feinberg et al., 2014](#_ENREF_17)) measured on the Quick Inventory of Depressive Symptomatology ([Samadi, McConkey, & Kelly](#_ENREF_48)) and PSI-SF ([Abidin, 1995](#_ENREF_2)). This study demonstrated how PSE reduced anxiety and depression among parents. This intervention comprised of only six, 30-minute interventions and it was unclear as to the longer term outcomes of these families.

The impact of **a Behavioral Parent Training Intervention (BPT)** was evaluated by Feldman and Werner among parents with intellectually disabled children and behavioral problems {aggression, self-injury, noncompliance and disruption averaging 10-13 years ([Feldman, Werner, & 2002](#_ENREF_18)). 18 BPT graduates were compared to 18 similar parents who were waiting for the services in a wait-list controlled study. They used the short form of questionnaire on resources and stress ([Friedrich, Greenberg, & Crnic, 1983](#_ENREF_19)) that is a reliable instrument used to measure depression in parents, as an outcome measure. The BPT graduates reported significantly less stress. This effect persisted up to 5 years following discharge.

***Programs for parents of infants and preschool children***

Some studies have concentrated on young infants and children. One small pilot randomized wait-list study, utilizing an 8-week ‘**parent-child interaction skills training group’** for parents of intellectually disabled children demonstrated efficacy in improving mental health outcomes of parents (stress, anxiety, rates of depression). It was found that parents acquired skills for responding more adequately to their children’s signals through group discussion of videos of mutual parental challenges, take-home assignments, as well as support from their social network ([Niccols & Mohamed, 2000](#_ENREF_41)). This study sample was small with 12 parents in the intervention group and 5 parents on the waiting-list (controls) and used only numerous self-reporting pre-test and post-test measures. Despite its size, the study showed reduction in parental distress and depression and demonstrated high levels of consumer satisfactionamong parents belonging to the intervention arm. Since the findings from this pilot study were exploratory there is need to interpret these results with caution because there was high loss to follow-up of participants ([Eyberg & Pincus, 1999](#_ENREF_16)).

Further examples of interventions promoting parent and child interaction includes the ‘p**arent–child interaction therapy’ (PCIT**) studied in a small wait list trial in Florida ([Bagner & Eyberg, 2007](#_ENREF_6)). This study used PCIT to treat disruptive behaviors among young children aged 3 to 6, with mental retardation and co-occurring oppositional defiant diagnosis. This study demonstrated that PCIT mothers were interacting positively with their intellectually disabled children than mothers in the wait-list group. The PCIT mothers also reported lower disruptive behaviors in their children ([Achenbach T & Rescorla L, 2000](#_ENREF_4)), and low parental stress after treatment ([Abidin, 1995](#_ENREF_2))). One weakness of this study, again, was that it had a low sample size, high participant attrition and absence of follow-up data.

***Adapted parenting training programs***

The **“Parent, Plus”** intervention for parents of intellectually disabled preschool children aged between 4 and 7 years, and behavioral issues was conducted in Ireland with a randomized wait list trial. This was a group-based eight week programme with staged video modelling. These were then discussed in the group. At follow up, the study reported significant reduction in stress on ‘questionnaire on resources and stress’ (QRS-F) ([Friedrich et al., 1983](#_ENREF_19)) with gains maintained at the end of 10-month follow-up ([Quinn, Carr, & I, 2007](#_ENREF_43)). A similar study done in Australia trialled the **Stepping Stones Triple P** parent training in a randomized wait list study for 47 families for intellectually disabled preschool children aged 2 and 7 years of and behavioral challenges from Disability Commission’s Register for Western Australian ([Basnet, Jaiswal, Adhikari, & Shyangwa, 2012](#_ENREF_9)). Reduced stress was found among parents in the intervention group, utilizing measures of parenting style and stress ([Arnold, O’Leary, Wolff, & Acker, 1993](#_ENREF_5); [Lovibond P. & Lovibond S., 1995](#_ENREF_34)) as well as independent observer’s assessment of parent-child interactions. Another study done in Australia trialed **the ‘Triple P program’** among fifty-nine families of children with autism spectrum disorder (ASD) or Asperger’s syndrome from Australia (aged 2 to 9 years) using both individual and group format ([Whittingham, Sofronoff, J, & Sanders, 2009](#_ENREF_59)). The limitation of this study was that it only focused on parental reports of child behavior and parenting styles. In spite of this, treatment effects of the intervention on enhanced child behavior were maintained even after 6 month of follow-up.

**The Incredible Years parent training** programme was also trailled among parents of intellectually disabled children (averaging 6 years), in Scotland. This small study (5 participants) also showed a reduction in total perceived stress among parents in using the ‘questionnaire on resources and stress’ (QRS-F) ([Friedrich et al., 1983](#_ENREF_19); [George, 2011](#_ENREF_22) ). It had no control group and a high attrition rate (40%).

One other study, that used the **Incredible Years Parent Training programme** for parents and preschool intellectually disabled children (aged 2 to 5 years), demonstrated that while there was evidence of efficacy of the intervention in reducing poor child behaviors, following a short follow-up period, no post-intervention change in depression among mothers of disabled children was found. ([McIntyre, 2008](#_ENREF_36)). This finding was reportedly due to to the fact that the Incredible Years Parent Training does not emphasize practical interventions for stress and depression ([McIntyre, 2008](#_ENREF_36)). An alternative explanation was that the Behavioral Parent Training is thought to aggravate parental stress because of additional demands it places on parents ([Gallagher, Beckman, & Cross, 1983](#_ENREF_20)). For carers with high psychological resources, one study has reported that these may be resilient because they may have already been perceiving spiritual benefits and perceiving positive contributions connected with the role of caring for the disabled child, and therefore the programme may not have any additional impact to these parents ([Hastings & Taunt, 2002](#_ENREF_27)).

***Stress reduction programs***

Another interventional study which was done in California employed ‘**Mindfulness based stress reduction’ (MBSR),** an intervention for carers of children with developmental delay ([Neece, 2014](#_ENREF_40)). This study involved randomly selected 46 parents of children with developmental delay assigned to either MBSR or wait list control groups. Parental psychological outcomes were measured using the ‘parenting stress index short form ([Abidin, 1995](#_ENREF_2)), and ‘Center for epidemiologic studies depression scale ([Ballou, 1995](#_ENREF_7)); and the Child Behavior Checklist ([Achenbach, 2000](#_ENREF_3)). Parents allocated to the MBSR had few stress and depression scores compared with those in the wait list control group. Above this, the children of the parents belonging to the MBSR reported minor behavioral related problems for their children. While the intervention showed great effectiveness, the study used parent’s self-reports, hence reporting bias could have prejudiced the findings.

A different approach has been taken in Eastern Turkey focusing on burnout among parents with intellectually disabled children ([Bilgin & Gozum, 2009](#_ENREF_11)). Parents in the intervention group had an interactive 60 minute programme, and also received an education booklet developed by the researchers. Parents in the waiting arm got the same intervention later. It was found that parents belonging to the intervention arm reported fewer episodes of emotional burnout than those in the control arm, using Maslach Burnout Inventory ([Ergin, 1992](#_ENREF_15) ). However, the intervention had no effects on perceptions of one’s success, competence or achievement in caring for their child. Although this study showed effects of the intervention, participants attrited selectively at time 2, especially in the intervention group. This was in a study with limited numbers of participants per group with no active treatment control group.

We only found one non randomized study from Todd and colleagues which demonstrated efficacy of a group based intervention that involved 25 parents with intellectually disabled children in two areas of Greater Manchester. This intervention showed effectiveness in reducing the frequency and impact of children’s challenging behaviors, and improving parental psychological well-being ([Todd, Blomley, & Loannon, 2010](#_ENREF_57)).

## Part two: Intervention studies from low income settings

Only a few trialshave examined the impact of psychosocial interventions on parental mental health outcomes among parents from low income settings.

Most African studies were done in Kenya, Uganda and Tanzania. One team in Kenya has looked at home-based interventions using ‘Augmentative and Alternative Communication’ (AAC) in non-group based interaction. The study examined the experiences of parents, for children with poor speech from age four to 12 years, in Kenya pre- and after a home-based intervention. This study led to usage of positive language by parents of children who had used augmentative and alternative communication program. This helped these parents to recognize their child’s strengths. ([Gona, R, S, & K, 2013](#_ENREF_24)).

In the Arabic world, a team has created group-based course (including seven sessions that run for approximately ten hours ) in Iran ([Samadi, McConkey. I, & Kelly, In press](#_ENREF_49)). In this small non randomized study wait control, parents of children (aged 3 to 17 years) were given a ‘group-based training’ program. Outcome measures on parental physical health, distress, and coping were done before and after the intervention. The success of the training was still evident repeated three months post-intervention. Parents in the intervention are satisfied and indicated that they would also recommend other parents to take part in similar training sessions. These parents also displayed improvements in their general health, reduced stress, and improved family functioning ([Samadi et al., In press](#_ENREF_49)).

An interventional Portage approach has been utilised in Northern Malawi where parental education was provided by local volunteers to ten parents with children, aged 0-5 years, with learning disabilities ([Kelly, Ghalaieny, & Devitt, 2012](#_ENREF_32)). Parents reported diverse improvement in children development. They were also satisfied with this parents education and support from the volunteers ([Kelly et al., 2012](#_ENREF_32)). This intervention is easy and cheap to implement in low income settings. It was facilitated by community volunteer-home visitors, only requires basic training and improvisation with local materials during home visits. Outcomes in this study were qualitative and not explicitly on mental health. Another study in Vietnam has also looked at the effects portage program through a one-year intervention for intellectually disabled children utilizing a randomized trial approach ([Shin et al., 2009](#_ENREF_52)). During this program, teachers educated parents during their weekly home visits, to work with their children through modeling and instruction. This study was conducted on a very small sample of intellectually disabled children. It was found that the intervention improved adaptive behaviors particularly in personal care and motor skills when measured with a [Vineland Adaptive Behavior Scale](https://www.pearsonclinical.com/psychology/products/100000668/vineland-adaptive-behavior-scales-second-edition-vineland-ii-vineland-ii.html) (VABS) Parents survey form ([Sparrow & Balla, 1984](#_ENREF_55)). .

One of the few randomized controlled trials which has been conducted in low income settings, is that from Bangladesh ([Khan, Gallo, Arghir, & Budisteanu, 2012](#_ENREF_33); [McConachie, Huq, Munir, & Ferdous, 2000](#_ENREF_35)). An outreach program was trialed among carers of 85 children with cerebral palsy aged between 1.5 to 5 years. Children from urban areas got daily center based mother to child group intervention and their parents got pictorial guidance manuals. The children from rural areas, on the other hand, got health advice given by Special-needs teachers and Health care workers who had been trained in physiotherapy and speech therapy. To measure maternal stress, perceived usefulness of support from family members and parental knowledge in disability, the researchers used Self-Report Questionnaire, family support scale ([Dunst, Jerkins, & Trivette, 1984](#_ENREF_12)), and maternal adaptation to the Child scale ([Hudson et al., 2003](#_ENREF_30)) respectively. Among the 85 children participating in the study, 58 children were successfully followed-up. At the follow up, it was found that maternal knowledge on child disability and social support had increased.

Studies in India have taken interactive psycho-educational group approaches to address parental needs. In one study, therapists (including speech therapists psychologists, and occupational therapists) conducted multidimensional training with 57 parents who were randomized to either an intervention lasting ten weeks or a control group therapy. The parents’ ability to manage their disabled children was then assessed using a ‘parental attitude scale towards the management of intellectually disabled children’ ([Bank, 2011](#_ENREF_8)). One limitation of this study was that the outcomes were not explicitly related to mental health. However, parents belonging to the intervention arm showed higher scores in parental attitude towards their child, had better knowledge of intellectual disability, but very little change in their attitude towards intellectual disability ([Russell, John, & Lakshamanan, 1999](#_ENREF_47)). This Indian group also conducted further analysis from the above study to evaluate the influence of the enhanced parental attitude on the parents’ acquisition of positive adaptive behaviors ([Russel, John, Lakshmanan, Russell, & Lakshmidevi, 2004](#_ENREF_46)). Here, 57 parents with intellectually disabled children and their parents were allocated to two study arms. The intervention group got 12 weeks of training in ‘Multimodal adaptive behavior training program and ‘Interactive group psycho-education while the control received a ‘Multimodal adaptive behavior training’ plus ‘Didactic lectures.’ It was found that 22 out of the 29 children in the intervention arm demonstrated significant improvements in the acquisition of positive adaptive behaviors compared to 4 of 28 children belonging to control arm (as measured by Vineland Social Maturity Scale ([Rischewski et al., 2008](#_ENREF_44)).

**Table 1:**

# Discussion, implications for disability care and future research

This narrative review has considered the present evidence on interventions aiming at the reduction psychological distress among parents with intellectually disabled children. Most of the studies that have been reviewed and that show effectiveness are small trials done in the developing world, either facilitated individually or in group settings. In these studies, a variety of different programs have been implemented and a variety of outcome measures have been utilized to show effectiveness. Very few studies have been done in low income settings. That, which has been conducted, demonstrates some efficacy, in spite of methodological limitations. Most of these studies have adopted interventions from industrialized countries. Furthermore, in low income settings, only single intervention studies have been used to reach conclusions ([Sinason, 2002](#_ENREF_53)).

Considering the socio-economic differences between high and low income countries, there could be multiple challenges in implementing such interventions. These include lack of personnel and expertise to facilitate training programs; limited resources to use for the interventions; limited access by the potential participants due to transportation problems; and contextual differences affecting cultural acceptability of the intervention. It is therefore vital that interventions are adapted to fit within the local cultural context and are acceptable for parents in these settings if we want to promote mental health resilience.

Much of the existing research from low income settings is small scale. The major challenge of implementing these interventions is their cultural insensitiveness. There is a great need for larger and multi-centered international research trials which can also employ validated and cross-cultural outcome measures. This would provide the opportunity to produce reliable and cross cultural results on both the positive and negative effects of these interventions on parental mental health and psychological resilience.

With limited resources and fewer psychologists in low-income countries, there is need to have cost-effective interventions provided by lower skilled community workers but that are beneficial to the psychosocial wellness for parents with intellectually disabled children in these settings.

There is accumulation of evidence indicating positive outcomes resulting from the training interventions. This indicates that culturally acceptable, evidence based programs should be designed, for low income settings, to nurture positive attitudes, skills, and knowledge. These will not only prevent psychological distress among parents with intellectually disabled children but also comforts and lessens parental distress. With the growing evidence for family resilience, it is important, not to focus on the negative impacts related to caring for disabled children but on the many positives as well ([Singer, Ethridge, & Aldana, 2007](#_ENREF_54)).

One limitation of this study is that it involved a review of studies of different quality.

**6 Conclusion**

From the present review a number of conclusions can be drawn. It is evident that the interventions improve mental health outcomes among the parents; improve their confidence in caring for their children; and improves their general wellbeing, and overall health related quality of life. To begin with, appropriate interventions and supports for parents with intellectually disabled children; like behavioural parent training, Incredible years training and others; help to promote parental mental health. Group Parent Models demonstrate more effectiveness, with parents benefiting from each other’s experience and may enable fewer resources to be spent from service providers. When designing interventions, it may be a good idea to match parents with similar needs and facilitate the interaction between them to enable these learning processes. Finally, it is vital that more evidence is produced from community based models sensitive to the cultural setting of individual low income countries. With this we are likely to also see positive outcomes among parents with intellectually disabled children. Studies where evidence was limited from low income settings were affected by implementation issues such as the cost of travel to venues or by the lack of emphasis provided on psychosocial support for parents. This will be important to address when implementing new programmes in these settings.

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**Conflict of interest**

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome. We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us. We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property. We understand that the Corresponding Author is the sole contact for the Editorial process (including Editorial Manager and direct communications with the office). He is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs. We confirm that we have provided a current, correct email address which is accessible by the Corresponding Author and which has been configured to accept email from cgmasulani@gmail.com

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