The Effectiveness of a Psychoeducation Intervention Delivered Via WhatsApp for Mothers of Children with Autism Spectrum Disorder ASD in The Kingdom of Saudi Arabia: A randomized controlled trial

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Mothers of Children with Autism Spectrum Disorder ASD in The Kingdom of Saudi

Arabia: A randomized controlled trial

Abstract

Background: Mothers of children with autism spectrum disorder (ASD) report high levels of

stress and lower levels of well-being than parents of typically developing children. Current

interventions for ASD typically focus on working with the child rather than delivering

strategies to help support parents.

Objective: To evaluate the effectiveness of a psychoeducation intervention developed to

support mothers of children with ASD in Saudi Arabia.

Method: Sixty two mothers (*23-52 years*) of children (*26-78 months*) were recruited to a

multi-site RCTs of the intervention. The intervention consisted of one face-to-face session

(60 minutes) and four virtual sessions (30 minutes each) delivered using WhatsApp.

Parenting stress was the primary outcome, with secondary outcomes focusing on maternal

depression, anxiety, and happiness, and child behaviour problems and ASD symptoms. Data

was collected at baseline T1, immediately post intervention T2 and 8 week follow-up T3.

Results: One way ANCOVA was used at T2 and T3 with T1 scores entered as a covariate.

Improvements were found at T2 for stress (F=234.34, P=0.00, d=-1.52), and depression

(F=195.70, P=0.00, d= -2.14) but not anxiety and these results were maintained at T3.

Changes in child behaviour problems were limited to improvements in hyperactivity at T2

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(F=133.66, P=0.00, d= -1.54). Although changes in stress and depression were statistically

significant, change to clinically normal levels was limited to depression. None of the

participants had recovered after the intervention (PSI-SF stress scores), while 23 mothers

(71.87%) in the intervention group had recovered at T2 and 22 (68.75%) at T3 (HADS

depression scores).

Conclusion: This intervention with WhatsApp support is beneficial but may need to be

augmented with other forms of support for mothers of children with ASD including more

condensed sessions on stress and interventions targeting anxiety.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder associated with

'persistent impairment in reciprocal social communication and social interaction, and

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restricted, repetitive patterns of behaviour, interest, or activities' with a worldwide prevalence

of around 1% (American Psychiatric Association 2013, p.53); and 0.6% in the Kingdom of

Saudi Arabia (KSA) (Al Jarallah *et al.* 2005). Research shows that parents' of child with

Autism experience high levels of stress after the diagnosis of their children (Gupta 2007,

Meirsschaut *et al.* 2010); higher than stress levels in parents of children with other disabilities

(Phetrasuwan and Miles 2009, Estes *et al.* 2009). Research also shows that parents of

children with ASD suffer from higher levels of depression (Benson and Karlof 2009, Carter

et al. 2009). Mothers usually experience higher levels of stress than other members of the

family (Ingersoll and Dvortcsak 2006a). Most evidence suggests a bi-directional relationship

between parenting stress and childhood behaviour problems (Osborne and Reed 2009,

Sofronoff and Farbotko 2002, Jones *et al.* 2014). This suggests that mothers' who experience

high levels of stress require strategies to manage their own stress levels, the additional stress

that may arise from behaviour problems in their child, as well as strategies to address

behaviour problems in the child that may manifest because of their own stress. Evidenced

also suggests that parent-focused interventions using cognitive behaviour techniques

elements (e.g., problem solving and cognitive restructuring) were found to be effective in

reducing maternal stress in parents of children with intellectual disabilities (Hastings and

Beck 2004)

The majority of parenting interventions have been designed to teach parents to apply

specific strategies focused on supporting the child (Ingersoll and Dvortcsak 2006b, Stiebel

1999). Only a few studies have evaluated the efficacy of parent training interventions, where

interventions were designed mainly for the benefit of parents, focusing on parental well-being

for parents of children with ASD (Bendixen *et al.* 2011, Keen *et al.* 2010, Ferraioli and Harris

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2013). However, the majority of these studies contain very small sample sizes and are often not adequately controlled (Chiang 2014, Samadi *et al.* 2013).

In addition, access to support for parents of children with ASD is often limited in Western countries due to barriers including insurance cover, parents' time constraints, and distance from major cities so self-help intervention might be promising (Karst and Van Hecke 2012). However, self-help interventions with minimal therapists' support for parents of children with ASD appear to have limited evidence to date due to small sample size, lack of adequate control, and poor tailoring of intervention strategies to underlying parental needs (Ingersoll *et al.* 2016). Almansour *et al.* (2013) acknowledged the shortage of available and affordable treatment options and training services for parents of children with ASD in KSA. Mothers of children with ASD in KSA face additional restrictions accessing parenting training including for example limited available transportation (e.g., buses and metros). Despite increasing access to technology, researchers in mental health are only slowly adopting the opportunities it brings to support the delivery of appropriate treatments (Hollis *et al.* 2015). The goal of this study was to evaluate the efficacy of a self-help Psychoeducation intervention with minimal therapists' support and delivered via WhatsApp.

Hypotheses

- Mothers in the intervention group (IG) will report lower stress than mothers in the care as usual (CAU) group.

- Mothers in the IG will report lower depression, anxiety, and child behaviour problems than mothers in the CAU group.

Methods

Trial design

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The design was a pragmatic randomized two-arm controlled trial with two conditions (IG versus CAU) and three time points (pre- intervention (T1), post-intervention (T2), and an eight week follow-up (T3)).

Participants

Mothers of children with ASD were recruited from autism organizations at KSA. Inclusion criteria for the study were i) mothers above the age of 18, living with their child with ASD, ii) Mothers capable of reading and writing in Arabic, iii) Mothers who had smart phones with a WhatsApp application

Sample size.

Based on the large effects sizes reductions in parenting stress reported by Ferraioli et al (2013), an alpha level of 0.05 and an analysis strategy focused on One Way ANCOVA with T1 scores entered as a covariate, a provisional estimate of power based on Cohen (1992) suggested a minimum of 26 participant per trial arm.

This study received ethics approval from The University of X, School of Medicine Ethics Committee and the committee at X in KSA. Consent forms were signed by all participants.

Randomisation/Blinding

Simple randomisation based on the odd and even method yielded blinded envelops to inform therapist of allocation to IG or CAU. The researchers were blind to allocation

Procedure

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Study information packs were distributed by the organisations to all eligible mothers with children with an ASD diagnosis from February 29th 2015 until March 30th 2015. Mothers who consented to participate were randomly allocated to trial arms. Copies of the training manual were distributed to mothers in the IG before the start of the first face-to-face session. Sessions 2 – 5 consisted of 30 minutes therapist support via WhatsApp. Mothers in the CAU group received advice about their child's educational and behavioural problems from the organizations. Three therapists assisted in delivering the intervention. One has a master's degree in psychology and four years' experience working with children with ASD and their mothers in an autism organisation. Two had a minimum of three years' of experience working with children with ASD, one with a graduate certificate in special education and the other a certified clinical psychologist.

Intervention

Psychological models of stress and coping, including the transactional model of stress developed by Lazarus and Launier (1978) and the Double ABCX Model developed by McCubbin and Patterson (1983), have contributed to the development of the intervention. One session was devoted to stress reduction, with the aim of reducing maternal stress in participants by changing the way mothers appraise stressful situation and their children's behaviour. The intervention targeted different stages of the Double ABCX Model (Pickard and Ingersoll 2016): devoting session one to inform mothers about the aetiology of ASD (aA component refers to any stressor); session two to target stress in mothers and how can they approach different stressful situations (Component cC refers to appraisal of a stressful situation); session three to child behaviour problems to help the mothers cope with the initial

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stressor of having a child with ASD; and session five to inform mothers about the available

resources in KSA (Component bB refers to resources).

Intervention materials were developed in the format of a booklet divided into five

sections (Table 1). The intervention was developed as a guided self-help (GSH) intervention

in line with the main principles and recommendations of NHS *Good Practice Guidance on*

the use of self-help materials within Increasing Access to Psychological Therapies IAPT

services (Baguley et al. 2010). WhatsApp is a free mobile messaging application in which

people can exchange private or group messages as well as visual and audio media (How it

Works 2016).

Measures

Parents' demographic questionnaire. Demographic questions collected information about

participants including mothers' age, child with ASD age, number of siblings with ASD and

their ages, marital status, mothers' education and occupation, and fathers' occupation.

Arabic standardized versions of the following measures were administered to

participants in this study as it is the official and mother language for people in KSA.

Parent Stress Index Short From (PSI-SF). The PSI-SF is a self-reported questionnaire that

aims to measure the stress associated with parenting (Abidin 1995). It includes 36 items

divided into three subscales, each contains 12 items: Parental Distress (PD); Parent–Child

Dysfunctional Interaction (PCDI) and Difficult Child (DC). The later measures parents'

perceptions of their children's temperament and compliance (Abidin 1995). The score of

most items range between one (strongly disagree) and five (strongly agree). Raw total scores

above 90 on the total score indicates clinically significant high level of stress.

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Hospital Anxiety and Depression scale (HADS). This measure is used to determine the

level of anxiety and depression (Zigmond and Snaith 1983) . It has 14 items, seven to

measure anxiety and seven for measuring depression. Each item has a choice of four

responses that are scored from 0 to 3 yielding a maximum score of 21 for each subscale.

Scores of 11 or more for either subscale of depression or anxiety are considered to indicate a

significant "case" of psychiatric co-morbidity

Strength and Difficulties Questionnaire (SDQ). This is a self-report questionnaire to

identify behavioural problems in children (Goodman 1997) . The SDQ parents' version of

children aged 4-12 was used. It includes 25 items divided into five subscales (five items each)

including emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship

problems, and prosocial behaviour. Parents are asked to indicate on a 3-point response scale

the extent to which their child shows symptoms of behavioural difficulties (1 = not true, 2 =

somewhat true, 3 = certainly true), and the total SDQ score is based on the sum of all the

subscales scores except for the pro-social one

The Indian Scale for assessment of Autism (ISAA). This scale was developed by the

National Institute of Mentally Handicapped for measuring the severity of autism. It is based

on Childhood Autism Rating Scale CARS by Schopler *et al.* (1980). It has 40 items rated on

a five-point scale (rarely, sometimes, frequently, mostly, and always)(National Institute for

the Mentally Handicapped 2009). According to the ISSA manual, autism is defined by a

score of 70. Total scores of 70 to 106 indicates mild autism, 107-153 moderate autism, and

scores of 153 and above indicate severe autism

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The Arabic Scale of Happiness (ASH). This is a measure developed originally in Arabic language then translated to English (Abdel-Khalek 2013). It was designed to measure happiness in adults. It has 20 items (five items are only fillers that do not contribute to scoring). Each item could be answered on a 5-point intensity scale. The total score ranges from 15 to 75.

Intervention implementation fidelity, Participants' compliance, and Satisfaction

After each session, the therapists sent questions asking participants to report the time spent reading the intervention manual, and to rate the usefulness of the training session on a scale from zero (unhelpful) to ten in (very helpful). They also kept records of attendance and were given *a Therapist's scripts* to remind them to go through the same essential topics.

Analysis strategy

Baseline equivalence between groups was analysed using a series of one-way ANOVA for continuous data and chi-square tests for discrete variables. Differences between groups at T2 and T3 were assessed using a series of one way ANCOVAS with T1 scores entered as covariates. Clinical significance was investigated using the two criteria: being closer to the mean of the normal population and the Reliable Change Index RCI (Jacobson and Truax 1991). Effect sizes were calculated based on change scores an interpreted based on the traditional conventions of effect size proposed by Cohen (1988).

A visual inspection of the data after T1 data collection revealed five cases that were not suitable for inclusion in the study as they scored within the normal range (>70) in ASD symptoms on ISSA. These five cases were withdrawn from the analysis because of the uncertainty of whether or not they met the inclusion criteria.

Results

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Participants' characteristics and flow

One hundred and thirty eight mothers were referred into the study from organizations

and baseline data were collected from 67 mothers who consented, who then were randomised

to either an IG or CAU. It was not possible to explore whether mothers who consented were

different from mothers who did not consent. See Figure 1 for the flow of participants through

the trial. The demographic characteristics are presented in Table 2. Children with ASD were

all at preschool age. Their mothers were predominantly in their thirties. Eight percent of

mothers had a second child with autism. The majority of mothers in the sample were highly

educated and much more educated than the average Saudi female (The Saudi Central

Department of Statistics and Information, 2013). The majority of the mothers were married,

with the sample containing less divorced women than might be expected given the Saudi

average divorce rate (The Saudi Central Department of Statistics and Information, 2013). A

minority of the mothers in the sample were working in professions that are typical

occupations for Saudi women. All fathers of children in the study were working. Fathers

worked in a range of professions, with a large proportion of soldiers and policeman.

Examination of differences at baseline between trial arms indicated no significant

differences.

Parental outcomes

The means and SDs for each parental outcome measure at T1 and T2 are presented in

Table 3. There was a significant effect of treatment on PSI-SF. An examination of the

corresponding effect sizes calculated using Cohen d revealed the differences at T2 to be very

large but was reduced at T3, to a large effect (Table 4). All three PSI-SF subscales

demonstrated a significant effect of intervention at T2, and also at T3. An examination of the

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corresponding effect sizes at T2 (Table 3) exhibited a very large effect size difference for the

PCDI subscale, a large effect size for the parental distress subscale and a small effect size for

the difficult child subscale in favour of intervention. At T3 the magnitude of effect sizes in

favour of intervention were attenuated for all three subscales, although the PCDI subscale

remain very large (d= -1.51) and the difficult child subscale remain small (d= -0.28) (but the

parental distress scale reduced from a large to a small effect size (d= -0.33). There was also a

significant effect of treatment group on HADS depression at T2 and T3 but not HADS

anxiety (Table 3). An examination of the corresponding effect sizes revealed the differences

at T2, and T3 to be very large and therefore meaningful (Table3). There was no meaningful

effect sizes differences at T2 and T3 for HADS anxiety which corroborated the lack of

statistical significance between the groups. There was also a significant effect of treatment

group on the Arabic happiness scale at T2 and T3 although the corresponding effect sizes

were small.

Child outcomes

There was a significant effect of treatment group on the Indian Scale for Autism

Assessment at T2 and T3 although the corresponding effect sizes were small There was a

significant effect of treatment group on the SDQ total at T2 (and T3 and the hyperactivity

scale at T2 and T3 (. However, no significant effect was shown for emotions, conduct, and

prosocial subscales either at T2 or T3. A close examination of the corresponding effect sizes

for SDQ revealed a large effect size at T2 and T3 for SDQ total and a very large effect size

for the hyperactivity subscale at T2) and T3. Not surprisingly, there was no effect on SDQ

emotions, conduct, and prosocial subscales at T2 and T3, which mirrors the lack of statistical

significance from the ANCOVA.

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An exploration of the relationship between participants' implementation fidelity and change in outcomes between T1 and T3 revealed two marginally significant effects for total number of minutes spent reading the manual and HADS depression and happiness).

Clinical Significance

Clinical significant change was examined in this study for the significant parental outcomes of PSI-SF and HADS depression. The number and percentage of participants who experienced clinical significance are displayed in table 5. For a participant to be considered as recovered after the course of an intervention, he or / she should achieve clinically significant change on both criteria: becoming close to the functional rather than dysfunctional population; and experiencing RC in their scores on the same measure (Jacobson, Roberts, Berns, & McGlinchey, 1999). A thorough inspection of the data in this study showed that no participant in this sample had recovered after the intervention (based on their PSI-SF scores). Even though three mothers in the intervention group had experienced clinically significant change on their PSI-SF scores by moving to the side of the normal population, these three participants did not experience any reliable significant change. Twenty three mothers (71.87%) in the intervention group had recovered at T2 and 22 (68.75%) at T3 based on their HADS depression scores.

Discussion

This study adds to the evidence based supporting the effectiveness of parent training interventions in enhancing parental well-being in mothers of children with ASD. Results of this study indicated that the intervention was effective in reducing maternal stress, depression, parent reported ASD symptoms, child behaviour problems, and increasing maternal happiness in mothers of children with ASD in KSA.

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Parental mean total stress score was significantly reduced in mothers in the IG and maintained at follow-up. This is consistent with other studies (Bendixen *et al.* 2011, Chiang 2014, Ferraioli and Harris 2013). Mean scores for all PSI-SF subscales were significantly reduced at T2which supports Bendixen *et al.* (2011).

A significant reduction in maternal depression post intervention was maintained at follow-up, a finding consistent with Bristol *et al.* (1993) Surprisingly, there was no reduction in maternal anxiety which contradicts the assertion that depression and anxiety scores are usually correlated (Almansour *et al.* 2013, Lee 2009 b). This might be due to the low internal consistency of the HADS anxiety or that the proposed intervention was not sufficient to reduce anxiety in mothers of children with ASD, as anxiety reduction was not a specific intervention target. Alternatively the positive affect of how mothers enjoy their environment in this particular sample which responded to intervention, might be different to the negative affect of depression which usually correlates with anxiety Watson *et al.* (1988). This assertion would fit with longitudinal data from Barker *et al.* (2011) showing a lack of association between anxiety and depression scores over time on mothers of children with ASD.

Parental reported ASD symptoms were significantly reduced at T2 and these results were maintained at follow-up. The theoretical explanation for why mothers reported reduced ASD symptoms post intervention is not clear, as strategies to directly target ASD were not included in the intervention. The complex relationship between parental well-being and child behaviour and the putative role of potential mediating variables was beyond the scope and statistical power of the current study. Child behaviour problems were also found to significantly decrease at T2, a finding that is consistent with the results of other studies

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evaluating interventions for parents of children with ASD (Tellegen and Sanders 2014, Whittingham *et al.* 2009).

Although changes in stress and depression were statistically significant, change to clinically normal levels was limited to depression. None of the participants had recovered after the intervention (PSI-SF stress scores), while 23 mothers in the IG had recovered at T2 and 22 at T3 (HADS depression scores). However, Jacobson and Truax (1991) noted that the aim for participants to be recovered after a course of an intervention might be too strict for people with pervasive and serious conditions. Therefore, as the participants of this study were mothers of children with ASD, it was not peculiar that they did not fully recover at the end of training.

Strengths

This study has many strong points. This study used a RCT design to evaluate the efficacy of the intervention, which is considered to be the golden design for programme evaluation (Akobeng 2005). The CONSORT statement guidelines for reporting RCTs were used in this study, which ensured a clear and comprehensive reporting of RCTs. Moreover, a follow-up data collection were used in this study to test the stability of findings overtime.

Limitations

The lack of objective measures of maternal well-being and child behaviour problems was a limitation in this study, however, the aim of the intervention was to evaluate the effect of the intervention on maternal well-being and mothers remain the best informants about their own well-being. Another limitation of this study is that it did not examine moderation due to the limited sample size. The design of this study did not allow an exploration of the differences in outcomes if the intervention was delivered face to face compared to WhatsApp

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(dismantling design). This study did not provide any information about health economics, even though the intervention was brief, self-administered, and delivered via WhatsApp, which could likely to be cost effective.

The low value of alpha in some of the measures in this study (HADS anxiety α=0.55, conduct subscale of SDQ α=0.49) could be cultural factors and these measures may not be entirely suitable for non-western populations. The Peer sub-scale in SDQ was removed from the analysis as it showed a very low internal consistency alpha value of 0.19.

Key messages

- As this was a small-scale study, it would be important in the future to replicate the study in a larger sample, especially as we now have information to inform a full power calculation.

- It will be important in future studies to explore the cost effectiveness of this intervention as a greater understanding of costs and benefits of the intervention could be used to build a business case for its implementation.

- It will be necessary to conduct a study on implementation, to be able to explore additional barriers to the use of the intervention in routine clinical practice within ASD organisations in KSA. Moreover, is to explore the relationship between mode of delivery, intervention intensity, and outcome.

- A larger study powered for mediation and moderation would help inform clinical servicers about why the intervention leads to change in outcomes and for whom the intervention is best suited.

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Table 1: Summary of the intervention sessions

Session' topic	Summary	Reference
What is Autism?	Aetiology of autism, including its causes, how it affects the lives of people with ASD, and the formal DSM-5 diagnosis criteria.	(APA 2013, Simpson and de Boer-Ott 2005)
Stress	Definition of stress, examples, causes and tips to help reduce stress in parents.	(Treacy *et al.* 2005)
Managing behaviour	Explaining behaviour, how behaviour occurs and different ways that will help parents to manage their children's behaviour problems.	(Wright and Williams 2007)

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Mood	Explaining mood, how can it affects the way people respond to different situations and how can different ways of thinking aggravate negative mood.	(L. Treacy, personal communication, October 10, 2015)
Resources for families	Listing the available resources to parents of children with ASD in KSA and contact information of ASD organisations and services in their regions.	(Al-Shodokhi and Al-Jabr 2010)

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Table 2 : Demographic characteristics of study sample (n=62)

Characteristics		IG	CAU
		N = 32	N = 30
Child age (months), M(SD)		63.18 (13.68)	58.73 (14.07)
Mother's age (years), M(SD)		32.90 (7.26)	34.43 (6.65)
Mothers with another ASD child, n (%)		3 (9.37)	2 (6.66)
Age of another ASD child, M(SD)		52.00 (15.62)	71.00 (52.32)
Education level, n (%), *[% in SA population]			
	Less than high school	5 (15.62)	5 (16.66)
	High school	9 (28.12)	11 (36.66)
	Bachelor's degree	18 (56.25)	14 (46.66)

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Marital status, n (%), [% in SA population]			
	Married	29 (90.62)	27 (90.00)
	Divorced	3 (9.37)	3 (10.00)
Working females, n (%), [% in SA population]		7 (21.87)	6 (20.00)
	Teachers	6 (18.75)	4 (13.33)
	Nurses	1 (3.12)	2 (6.66)

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	Soldiers	9 (28.12)	11 (36.66)
	IT	3 (9.37)	3 (10.00)
	Teachers	6 (18.75)	4 (13.33)
Fathers' jobs, n (%)	Administrative work	11 (34.37)	8 (26.66)
	Business	1 (3.12)	2 (6.66)
	Physicians	2 (6.25)	2 (6.66)

*Only available information about Percentages in KSA population is presented (from Saudi central department of Statistics and Information based on 2010 census)

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Table 3 : Means and SDs for outcomes at T1 and T2

Measure	Intervention N=32 M (SD)		CAU N=30 M (SD)		F (P value)	Cohen's d T1 to T2
	T1	T2	T1	T2		
PSI-SF	129.96(13.82)	116.18(12.65)	132.80(13.07)	139.400(13.34)	234.34(<0.001)	-1.52
Parental distress	43.84(6.74)	41.46(6.43)	45.53(6.24)	48.36(5.75)	195.71(<0.001)	-0.80
Parent child dysfunctional interaction	40.75(6.94)	30.59(5.48)	41.5(5.95)	44.30(5.91)	206.68(<0.001)	-2.01
Difficult child(revised)	41.28(4.21)	40.12(4.20)	41.90(4.23)	42.76(4.26)	44.25(<0.001)	-0.47
HADS (depression)	10.68(3.56)	3.84(2.49)	10.66(3.47)	11.36(3.42)	195.70(<0.001)	-2.14

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HADS (anxiety)	7.71(2.45)	7.59(2.09)	7.63(2.77)	7.83(2.64)	3.76(0.057)	-0.12
Happiness	43.71(9.33)	47.50(8.56)	43.13(10.26)	43.46(9.80)	121.32(<0.001)	0.35
ISAA	100.50(13.60)	91.71(12.76)	101.20(14.16)	95.66(13.82)	21.85(<0.001)	-0.23
SDQ (revised)	14.40(4.44)	10.40(3.60)	14.83(4.37)	14.76(3.89)	100.63(<0.001)	-0.89
Emotional	4.50(2.09)	4.50(2.09)	4.50(2.31)	4.56(2.29)	.69(0.40)	-0.03
Hyperactivity	6.68(2.40)	2.84(1.95)	7.00(2.21)	6.70(2.26)	133.66(<0.001)	-1.54
Conduct	3.21(1.80)	3.21(1.80)	3.33(1.93)	3.43(1.85)	2.20(0.14)	-0.05
Prosocial	3.78(2.35)	3.78(2.35)	4.33(2.39)	4.60(2.12)	7.03(0.10)	-0.11

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Table 4 : Means and SDs for outcomes at T1 and T3

Measure	Intervention		CAU			
	M (SD)		M (SD)			
	T1	T3	T1	T3	F (P value)	Cohen's d T1 to T3
PSI-SF	129.96(13.82)	116.50(12.46)	132.80(13.07)	132.56(12.86)	131.47(<0.001)	-0.98
Parental distress	43.84(6.74)	41.50(6.42)	45.53(6.24)	45.36(6.13)	64.39(<0.001)	-0.33
Parent child dysfunctional interaction	40.75(6.94)	30.96(5.32)	41.5(5.95)	41.50(5.78)	137.92(<0.001)	-1.51
Difficult child(revised)	41.28(4.21)	40.03(4.12)	41.90(4.23)	41.83(4.29)	28.95 (<0.001)	-0.28
HADS (depression)	10.68(3.56)	4.12(2.49)	10.66(3.47)	11.33(3.39)	183.58 (<0.001)	-2.05
HADS (anxiety)	7.71(2.45)	7.65(2.00)	7.63(2.77)	7.86(2.67)	1.69(0.19)	-0.11

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Happiness	43.71(9.33)	47.62(8.47)	43.13(10.26)	43.56(9.63)	95.46 (<0.001)	0.35
ISAA	100.50(13.60)	91.68(12.72)	101.20(14.16)	95.66(13.84)	23.23 (<0.001)	-0.23
SDQ (revised)	14.40(4.44)	14.75(4.21)	14.83(4.37)	19.53(4.09)	41.80 (<0.001)	-0.98
Emotional	4.50(2.09)	4.56(2.03)	4.50(2.31)	4.63(2.25)	0.28(0.59)	-0.03
Hyperactivity	6.68(2.40)	3.09(1.85)	7.00(2.21)	6.80(2.34)	115.85 (<0.001)	-1.47
Conduct	3.21(1.80)	3.25(1.77)	3.33(1.93)	3.46(1.81)	1.14(0.28)	-0.05
Prosocial	3.78(2.35)	3.84(2.39)	4.33(2.39)	4.63(2.15)	3.63(0.06)	-0.10

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Table 5: The number and percentage of reliably and clinically improved mothers for each significant measure for the IG and CAU

Measures		Reliably improved N (%)		Clinically improved N (%)	
		T2	T3	T2	T3
PSI-SF	IG	12 (37.5)	11 (34.37)	3 (9.37)	3 (9.37)
	CAU	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.33)
HADS-depression	IG	24 (75)	24 (75)	30 (93.75)	29 (90.62)
	CAU	0 (0.00)	0 (0.00)	3 (10)	3 (10)

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Figure 1: Flowchart diagram showing the flow of participants through each stage of the trial.

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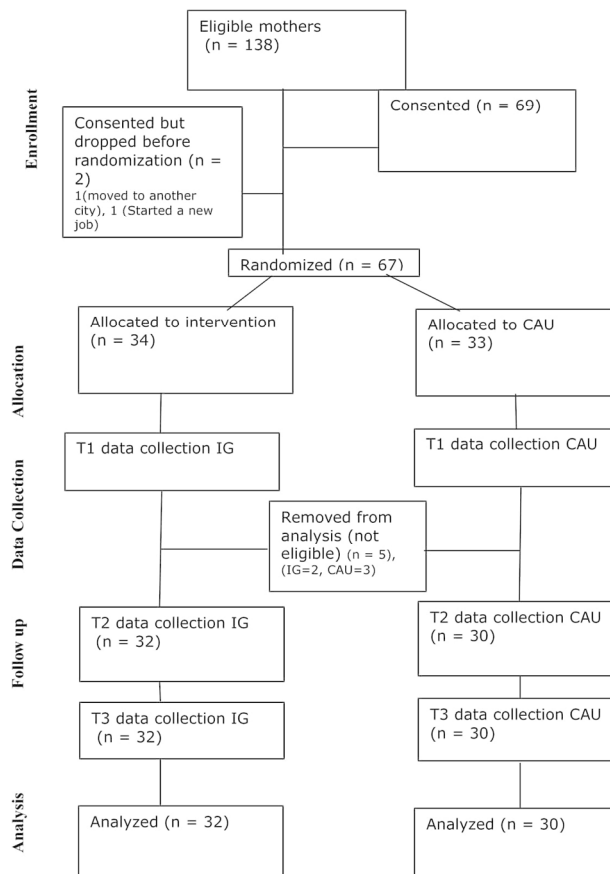51
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Figure 1: Flowchart diagram showing the flow of participants through each stage of the trial.

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