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Title

Confident and Understanding Parents (CUPs) – a child nutrition and active-play pilot intervention for disadvantaged families attending Supported Playgroups in Victoria, Australia

Short title

Child nutrition and active play in Supported Playgroups

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The authors declare no conflict of interest

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Abstract

Issue addressed

Health and nutrition inequalities are prevalent among families from socio-economically disadvantaged backgrounds. However, there is limited evidence of targeted early childhood nutrition and active play approaches due to the methodological challenges in engaging vulnerable families in research.

Methods

The aim of this paper is to report findings from a pilot intervention called Confident and Understanding Parents (CUPs). CUPs aims to improve child nutrition and active play-related outcomes for children in vulnerable families. The intervention was delivered in six Supported Playgroups (SPs) in two disadvantaged locations in Victoria. Surveys incorporated knowledge and confidence measures and were administered pre- and post-training of SP facilitators along with pre-, immediately post- and 3 months post-intervention to SP facilitators and parents. Qualitative data were collected via debriefing discussions with SP facilitators and ethnographic observations during SP sessions. Thematic analyses of qualitative data and statistical quantitative analyses were conducted.

Results

Nine SP facilitators completed training, of whom six delivered CUPs in SPs with 64 parents of children aged 0 to 4 years from socially-disadvantaged backgrounds. Forty-three parents (66%) attended a minimum of 50% of SP sessions with CUPs delivery. SP facilitators and parents demonstrated improved knowledge and confidence following the pilot. Learnings for implementation were identified.

Conclusion

Overall, the CUPs intervention reached and engaged vulnerable families. A strength of the intervention is the flexibility offered to SP facilitators in selecting key messages and the

strong focus on "local" translation of key child nutrition and active play messages within existing early childhood settings. A further strength was the adaptation of evaluation methodology to optimise the engagement of vulnerable families.

So what?

This pilot study provides insights about engaging vulnerable families in a nutrition and active play intervention to promote child health. These promising findings warrant further implementation and rigorous evaluation of CUPs.

Introduction

Suitable nutrition and active play practices in early childhood promote healthy growth and development and can reduce the risk of poor health outcomes later in life (1, 2). Incremental and timely nutrition and physical activity improvements in early life can substantially reduce the risk of chronic disease such as cardiovascular disease and diabetes (3). However, more than 730,000 children in Australia face inequities in their health and developmental outcomes (4). Health and nutrition inequalities are prevalent among families from culturally and linguistically diverse (CALD) backgrounds including migrants, refugees and Indigenous Australians (5). Evidence shows a social gradient exists that places vulnerable families at greater risk of difficulties obtaining, understanding and applying child-health promotion advice (6, 7). Consequently, vulnerable families are less able to access and engage with health information and services, thus potentially widening the inequity gap (8).

Playgroups are important for building community connections especially for families not engaged in routine early childhood services (such as Maternal and Child Health (MCH), preschool or childcare) (9). Playgroups are informal play-based sessions intended for both young children (aged birth to four years) and their parents /carers to meet in a relaxed environment and are facilitated by the participating parents themselves. Supported Playgroups (SPs) are a specific category of playgroup involving employed facilitators (who may be bicultural workers) to support specific community groups at risk of vulnerability (9). SPs generally target families who are at risk of social adversities such as families who are Indigenous, from other CALD backgrounds, socially isolated, experiencing mental health issues or living with disability. SP facilitators support families in accessing services and information thus provide a 'soft-entry-point' into mainstream early childhood services (such

as MCH or preschool). The term 'parents' will be used throughout this paper and is inclusive of carers and other family members. Emerging research suggests that attending SPs may improve parents' social support and increase parents' ability to care for young children (10). Attendance at SPs may also improve children's social and educational outcomes (9, 11) promote healthy eating behaviours of mothers (12, 13) and support active play among young children (14). Previous research demonstrates that children attending SPs consume more packaged foods and sweet drinks, experience greater food insecurity and have greater exposure to television and electronic screens than children the same age attending MCH services or childcare services in the same location (15). Therefore SPs provide an ideal setting for reaching vulnerable families to deliver nutrition and active play information and support (16). Despite this, there is limited evidence of nutrition and active play interventions using SPs as a setting to promote child nutrition.

Aim

The aim of this paper is to report the findings from a pilot intervention called Confident and Understanding Parents (CUPs) delivered in SPs. CUPs aims to improve child nutrition and active play related outcomes for children in vulnerable families through building knowledge and confidence of SP facilitators to deliver key child health messages to families.

Methods

Intervention

CUPs is a community-based child nutrition and active play intervention that was co-designed with SP program providers and parents from CALD backgrounds (17) to ensure cultural relevance, acceptability to families and feasibility of its delivery in SPs (18, 19) (Table 1). The key components of CUPs intervention are 1) ten evidence-based nutrition and active play messages (Table 2), 2) training, resources and support for SP facilitators to deliver nutrition and active play messages, and 3) delivery of messages by SP facilitators during SP sessions.

All components of the intervention were underpinned by best practise principles of early childhood development within the socio-ecological model of health (20) and with considerations for cultural competence, social learning, health beliefs and health literacy (21-

23). The intervention takes a strengths-based approach to working with SP facilitators and parents (24).

The ten key CUPs messages were informed by previous research (25), best-practice evidence-based nutrition and active play guidelines in early childhood (26-28)(29) and consistent with advice provided by MCH nurses during routine child health visits.

Training for SP facilitators consisted of one six-hour or two three-hour sessions providing details of messages and practical strategies for delivery in SPs. Training included case scenarios (e.g. how to discuss limiting children's sweet drinks with parents as part of the 'use a cup' message) and strengths-based mastery (e.g. incorporating SP facilitators' suggestions about how to best communicate the messages) to build knowledge and confidence in delivering the CUPs messages. SP facilitators selected six (from ten) messages to discuss with parents (during the routine two-hour SP session) over 6 weeks during a SP 10-week 'term'. Six messages are consistent with the format within other 'new parent' groups routinely provided by MCH nurses (30).

Evaluation Design

The evaluation of the pilot utilised both qualitative and quantitative measures. The intervention components assessed were the training program for SP facilitators and delivery of the intervention in SPs. Participants in the evaluation of the pilot were SP facilitators and parents attending SPs. Ethics was approved by the university (approval 2013 177V) and state education authorities (approval 2014_002283).

Project Advisory Group

A Project Advisory Group comprising representatives from relevant government and non-government organisations provided project governance. The Project Advisory Group identified two Local Government Areas (LGAs) from the most disadvantaged locations in Victoria, Australia according to the Socio-Economic Indexes for Area – Index of Relative Socio-economic Disadvantage (31). The index is derived from attributes that reflect disadvantage including low income, low educational attainment, high cultural diversity and high unemployment. Subsequently key stakeholders from each LGA nominated representatives for a Local Working Group comprising SP program providers, MCH nurses,

and non-government agency representatives. Each Local Working Group selected three SPs to pilot the intervention in their LGA providing a total of six sites.

Setting

The intervention was piloted in six existing SPs in the most highly disadvantaged suburbs within the two selected LGAs. The complex needs of families and informal nature of SPs means that attendance at SPs varies between and within groups (6 – 20 parents attend 30 – 40% of the time). Barriers to regular SP attendance include the weather, access to transport, children's health status, leaving the house on time or dissatisfaction with the venue (32). Duration of SP attendance varies between one 'school-based' term (approximately 10 weeks) and 1 – 2 years (Playgroup Victoria personal communication).

Recruitment and consent

Each Local Working Group introduced researchers to the SP facilitators who provided informed consent for participation in the project before commencing training. All parents attending the nominated SPs were eligible and invited to participate in the evaluation by researchers (and SP facilitators to interpret when required). Although all parents attending SPs received the intervention, evaluation was based on participants who attended three or more SP sessions when the six CUPs messages were delivered. Parents provided written consent to participate in the evaluation.

Data Collection

Quantitative measures.

SP facilitators were surveyed pre- and post- training. Parents and SP facilitators were surveyed pre-intervention, immediately post-intervention, and three months post-intervention. Five-point Likert scale surveys were adapted from previously validated instruments (33-35) to assess changes to confidence of parents in implementing the CUPs messages. Parental confidence and self-efficacy is associated with healthy eating and less sedentary behaviours of children (35). Sample survey statements included 'It is easy to play outside with my child every day', and 'It is easy to let my child feed themselves'. Possible Likert scale responses were from 1 (very hard) to 5 (very easy). Surveys were modified following piloting for face and content validity to ensure literacy and cultural applicability. Modifications involved a reduced number of questions and use of culturally-inclusive images (17). Surveys were completed verbally on a one-to-one basis with researchers (and SP facilitators to interpret

when required) before and following the intervention. Similar five-point Likert scale surveys (e.g. 'It is easy to *introduce the message 'play outside every day')* assessed changes in SP facilitator confidence to deliver the messages. Ten additional knowledge-based questions based on the ten key messages were completed with SP facilitators to assess changes in knowledge pre- and post-training, pre-intervention, post-intervention and 3 months post-intervention. Attendance records of parents and SP facilitators were also maintained.

Qualitative measures.

Researchers debriefed with SP facilitators following each SP session using prompts from a discussion guide about the applicability of the CUPs messages, receptiveness of parents, and cultural sensitivities. Sample questions asked during discussions with SP facilitators included 'Do you think parents will do anything different at home?' and 'If you discussed these m*essages again, is there a better way to share this information with parents?'*. An ethnographic approach was employed which involved two or three researchers attending all training, all SP sessions and a follow-up visit 3 months post-intervention. Thus researchers were both trainers and evaluators, frequently discussing their observations and reflections with SP facilitators throughout the intervention to identify barriers and enablers of implementing the intervention. Field notes of observations and discussions with SP facilitators and parents were documented.

Data Analysis

Qualitative and quantitative analyses were conducted with data collected from debriefing discussions (n=36) with SP facilitators, surveys [SP facilitators (n=9) and parents (n=43)] and field notes from observations of program implementation (n=36). Hand-written field notes were typed at the end of every observation and cross-checked to confirm details by the researchers who attended the sessions (JM, JL and GN).

All sources of data were prepared in word documents and analysed manually. Researchers used a process of thematic analysis to identify key themes (36). Two researchers (JM, GN) independently coded and categorised the data. They then compared categories and refined them to identify the key themes and sub-themes. Several meetings were held with the authorship team and a meeting with the Project Advisory Group to discuss and ascertain consensus of the results. Three themes were identified and are reported in the results. The themes are 1) SP facilitator Training, 2) Intervention Implementation, and 3) Learnings for

future Implementation. Quotes to illustrate key themes were selected. Frequencies and descriptive statistics (mean +/- SD) were used to analyse the survey data. Quantitative survey results were tallied and descriptive statistics (mean and standard deviations) were obtained.

Results

Participants

Nine SP facilitators participated in the training, of whom six SP facilitators delivered the intervention in six SPs. (Additional SP facilitators were trained in case of illness or other contingency) (Table 3). Five facilitators were overseas-born, four had degree-level education and three reported having limited English literacy skills, though understood and spoke English well.

Sixty-four parents participated in the intervention with 27 parents (42%) attending at least 80% (5 or 6) of the sessions and 43 parents (66%) completing post-intervention surveys (Table 3). English language was spoken at home for 37 (58%) parents. Thirty-five parents (55%) were overseas-born, six parents (9%) were from Aboriginal backgrounds and 17 parents (27%) had educational attainment no higher than secondary schooling. Attendance rates at each SP ranged from 3 to 28 parents per SP. Variable attendance was expected due to the informality of SPs.

SP facilitator training

SP facilitator knowledge and confidence was measured using surveys pre- and post- training as well as qualitative discussion groups and ethnographic observations. SP facilitators reported improvements in knowledge (mean = 6.8 to 9.0 out of 10) and confidence (mean = 3.6 to 4.7 out of 5) following training (Table 4). For example:

> *You need the training first… if I just have the pictures I don't know how to talk about* them and *wouldn't do it. I need confidence first to explain it. (Urban SP 3)*
>
> *Training hit the mark…today we learnt a lot (Urban SP1)*

SP facilitators expressed their need for more time to practise the messages during training and requested more practical ideas to introduce the messages to parents. SP facilitators also acknowledged difficulty for parents changing habits already established, cultural considerations when discussing the messages, and some requested suggestions to involve children in the messages (e.g. activities such as colouring-in pictures of healthy foods).

Intervention implementation

A different message was delivered each week across different SPs as determined by SP facilitators. All SP facilitators selected the messages 'play outside every day' (n=64 parents heard the message) and 'turn off the TV' (n=54 parents). Other frequently discussed messages were 'eat fruit and vegetables' (n=45 parents) and 'develop routines' (n=37 parents) (Table 2). The topics 'breastfeed your baby', and 'start baby food at 6 months' were discussed informally with individual parents of infants as needed rather than the whole group (most children attending SPs were one to four years old). SP facilitators identified the message 'use local services' as superfluous as it was part of regular delivery of the SP program.

Surveys and observations demonstrated gains in SP facilitators and parents' confidence with the messages throughout the six-week intervention For SP facilitators, confidence increased after the intervention (mean 3.6 pre-training to 4.7 post-intervention out of 5) and knowledge increase was sustained (mean 6.8 pre-training to 8.3 post-intervention out of 10) (Table 4). For parents, survey results showed confidence increased after the intervention (mean 4.0 to 4.3 out of 5). Further, SP facilitators were able to identify instances of parents' receptiveness to messages.

> *Parents maybe hear this information before, but they didn't know why. Now they* understand the reasons (Urban SP2)
>
> *They took a lot of points…. they will definitely try at home…they listen to the message* about speech (development and using a cup) (Urban SP3)

Discussions with and observations of SP facilitators highlighted the multiple ways that messages were delivered by SP facilitators. Options included formal approaches to the whole group, small group discussions, modelling practices during the playgroup and informal conversations with individual parents. Some SP facilitators shared their own experiences with the group to convey the messages simply and clearly.

> *My daughter didn't like fruit, then we set up a routine of cutting it up together, now* she enjoys (Urban SP1)

Another positive element relating to the implementation of the CUPs intervention was the informal nature of the delivery of messages.

> *Having open conversation. It's really helpful. Different from when I had the other* children (Regional SP3)
>
> *It's not in your face; it's like we have a chat* (Regional SP3)
>
> They (parents) felt good about asking questions (Urban SP1)
>
> *I like the 'routines' message the most. It links all the other messages together (Urban* SP2)

Learnings for future implementation

Several challenges for the implementation of CUPs in SPs were identified. Noted challenges included the competing priorities of SP facilitators to welcome new families, the desire to respond to individual parent's needs, venue set-up and pack-up time demands, integrating delivery of messages with existing activities (e.g. story-time and singing), and prioritising suitable opportunities to embed CUPs messages into SP activities. At SPs with large attendance there was limited opportunity for meaningful engagement with the messages. As such, researchers observed that CUPs delivery in addition to other demands of SP facilitators' role could be difficult. One facilitator co-delivered messages with the support of a MCH nurse, and others deferred to researchers for back-up support.

Other barriers to implementation of the intervention included inconsistent professional development opportunities and funding to support the SP facilitator training, difficulties in the timing of the intervention conflicting with end of year activities, and perceptions by a small number of SP facilitators that some parents 'already know' the information. In some SPs, resources (e.g. drinking cups, children's tables and chairs) were insufficient or the venue was unsuitable (e.g. one SP was conducted in the basement of a sporting club without any heating in winter).

Despite the barriers associated with conducting evaluations within vulnerable population groups, some promising changes in behaviour were observed during, immediately post- and three months post- intervention. For example, researchers observed behaviour changes during SPs such as some children selecting fruits and vegetables and self-feeding, and sitting down during snacks. Parents reported that they incorporated messages in a variety of ways. For example, choosing to bring fruit and vegetables to SP instead of sweet biscuits and cakes,

offering water instead of sweet drinks, encouraging children to sit down during snack time and encouraging outdoor play during the allocated time in the SP.

Observations and responses from SP facilitators confirmed anecdotal reports of positive child enactment of the CUPs messages.

> One family has hidden the iPad, turned off the TV and getting out more (Urban SP2)
>
> They are all shocked their children are trying [vegetables that are new to them] (Regional SP1)

Observations and parent reports were also promising three months post-intervention.

> Cup, vegetables, play (Regional SP1)
>
> *Playing outside more…less 'junk' food…more healthy (Regional SP2)*
>
> *I have changed everything! TV off… go outside (Urban SP2)*

Discussion

Early childhood policy and program managers strive to reduce the impact of social inequity through targeted strategies to meet the needs of vulnerable families (37). Evidence-based messages promoting child health and development through healthy eating and active play are well documented (26). However, 'translating' key messages into practical guidance for parental uptake remains a challenge particularly for families experiencing adversity (38). Families experiencing disadvantage have been over-represented in reports of low fruit and vegetable consumption, reliance on sweet drinks and snacks, concerns about risks of active play and confusion about the role of electronic screen use for language development and education (39-42). Key messages promoting child health may be new to parents not attending the scheduled MCH visits (43), 'new parent' groups (44) or other health services (8).

In this study, parents from diverse backgrounds participated in the CUPs intervention delivered within their usual SP program. Overall, parents received, understood, gained confidence and enacted some key messages despite potentially complex language, cultural and health literacy challenges. Parents responded to the messages in a variety of ways, confirming the need to offer a range of strategies including discussion, role modelling and repetition to support understanding and uptake (45, 46). Some parents reported changed practises such as children's drinks, snacks, or routines around sleep, whilst others prioritised outdoor play, or set limits to electronic screen access. Unlike other research in highly

socially disadvantaged locations in Australia (47-49) this intervention was specifically co-designed for families from culturally diverse and socially disadvantaged backgrounds.

Embedding the CUPs intervention into an existing setting enhanced reach and uptake by parents who may experience challenges accessing mainstream early childhood services. Mainstream services strive to provide culturally applicable services but may find it challenging to be responsive to the specific needs of some parents (43, 50) whereas it is implicit in the nature of SPs to be socially and culturally inclusive (51).
The informal nature of SPs is a strength for engaging vulnerable families (52) however variable attendance at SPs is common (11, 14). Participation in the CUPs intervention may be improved by repeating sessions or extending the intervention over two SP terms instead of one. Extending the implementation duration may strengthen opportunities for behaviour change and reinforcement (24, 53).

A strength of the CUPs intervention was the practical training for facilitators enabling them to engage and tailor the messages to their own SP context. SP facilitators gained knowledge and confidence to effectively communicate key messages to families that may be misunderstood or not prioritised when conveyed by health professionals (54). For example, SP facilitators adapted delivery of messages for each local context and cultural group (21, 55). Ongoing mentoring and the ethnographic approach fostered capacity building of SP facilitators to support parental behaviour change and was considered a strength of the design and implementation of the intervention (56-58).

Highly vulnerable populations are typically excluded from intervention research due to methodological challenges and difficulties engaging culturally diverse or disadvantaged families (7). As such, the evaluation of CUPs posed a challenge due to large variability in English language and literacy of the target population. The modified quantitative surveys were combined with a qualitative, ethnographic approach to clarify and enrich data (59). Objective measures such as weighed food records, food frequency questionnaires and accelerometers (34, 60-62) may be more rigorous but were considered too intrusive for families from highly disadvantaged backgrounds. All stages of the CUPs implementation and evaluation took a strengths-based and inclusive approach.

Study limitations

The study was based on a small sample of convenience. Evaluation was limited to parents attending regular community SPs for a minimum of three sessions. The research team facilitated all components of the intervention including development, training, and evaluation contributing to potential bias; however, the nature of the evaluation ensured that data collection encompassed both strengths and weaknesses of the intervention. Social desirability bias was minimised through a consistent presence at training and SPs enabling researchers to establish trusting relationships with SP facilitators and parents. The impact of the intervention on children's nutrition and physical activity practices was not evaluated.

However, qualitative data showed that there was a positive impact in relation to parents changing nutrition and active play practices at the SPs and at home. Assessment of nutrition intake and physical activity reports from families could be included in future research with adequate consultation to ensure understanding and appropriateness of methods.

Conclusion

This pilot study provides insights about engaging vulnerable families in nutrition and active play messages for their children. Such insights are currently lacking in the literature due to the methodological challenges of including diverse population groups.
The strength of the approach in this intervention is the flexibility offered to SP facilitators in selecting key messages and the strong focus on "local" translation of key child nutrition and active play messages within an existing early childhood setting. A further strength was the adaptation of evaluation methodology to optimise engagement of vulnerable families. These promising findings suggest that a larger implementation and evaluation study of the CUPs intervention is warranted.

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Table 1: Logic model for the CUPs intervention[1]

Input	Immediate impact	Short-term impact	Behavioural impact	Outcome
SP facilitators are trained in CUPs	Facilitators implement CUPs in existing SPs	Increased knowledge and confidence in discussing child nutrition messages	Ongoing sharing of these messages with families	Nutrition messages are embedded into SPs
SP facilitators deliver the CUPs program in existing SPs.	Parents attending existing SPs receive key nutrition messages	Increased knowledge and confidence about child nutrition	Practice changes around food and physical activity routines	Improved child health
SPs offer a welcoming, non-stigmatising environment[2]	Vulnerable families are engaged and attend SPs	Increased knowledge and confidence about early childhood settings and services	Increased uptake by families of MCH, immunisation, kindergarten etc.	Improved early childhood health, development and school readiness

[1] The paper reports on immediate and short-term impact of training and delivery of the intervention.

[2] These characteristics of SPs are not part of the intervention

Table 2: Ten CUPs messages

Ten CUPs messages	Reference	Number of times message delivered (number of parents present)
Play outside every day	1	6 (65)
Turn off the TV	1	6 (54)
Eat fruit and vegetables	2	5 (45)
Develop routines for eating, sleep and play	1, 3	5 (37)
Let children feed themselves	2, 3	4 (51)
Use a cup	2, 3	4 (45)
Enjoy home cooked foods with your children	2, 3	3 (25)
Start food at around 6 months	2, 3	1 (8)
Breastfeed your baby	2, 3	1 (5)
Use local children's services		1 (10)

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Table 3: Characteristics and attendance at Supported Playgroups

Location	SEIFA-IRSD^ LGA (SP suburbs)	SP Facilitators		Parents enrolled	Parents completion	Number of families who attended >80% (5 or 6) sessions
		Training	Delivery			
Urban (3 SPs)	974* (801, 931)	6	3	33	24 (73%)	14 (42%)
Regional (3 SPs)	980# (867, 943)	3	3	31	19 (61%)	13 (42%)
Total		9	6	64	43 (67%)	27 (42%)

^Socio-economic Index For Area - Index of Relative Socio-economic disadvantage. Based on Census 2011, Australian Bureau of Statistics

*2nd Decile in state

4th Decile in state

Table 4: Changes in SP facilitator knowledge and confidence; and Parent confidence pre- and post-training and post program

	SP Facilitators	**Knowledge (out of 10)**			**Confidence (out of 5)**		
		Pre-training	Post-training	Post-program	Pre-training	Post-training	Post-program
Urban	N= 5	6.6 (1.8)	9.0 (0.7)	8.0 (0.8)	3.1 (0.6)	4.2 (0.4)	4.8 (0.3)
Regional	N= 4	7.0 (1.8)	8.8 (0.5)	8.7 (0.6)	4.1 (1.0)	4.7 (0.3)	4.6 (0.4)
TOTAL	N=9	6.8 (1.7)	9.0 (0.5)	8.3 (0.8)	3.6 (1.0)	4.4 (0.4)	4.7 (0.3)
	Parents	**Confidence (out of 5)**					
	Pre-program	Pre-program	Post program	Post-program			
Urban	N=33	3.8 (0.6)	N=24	4.1 (1.0)			
Regional	N=31	4.2 (0.5)	N=19	4.5 (0.4)			
TOTAL	N=64	4.0 (0.6)	N=43	4.3 (0.5)			

Data reported in Mean (SD)