

# Randomized controlled trial of occupational performance coaching for mothers of children with cerebral palsy

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## Abstract

**Introduction:** The purpose of this study was to assess the efficacy of occupational performance coaching in mothers of children with cerebral palsy.

**Method:** A randomized controlled trial was used. Thirty mothers of children with cerebral palsy were randomly assigned to an occupational performance coaching group or control group. The Canadian Occupational Performance Measure and Sherer General Self-efficacy Scale were measured before and after the study.

**Results:** Occupational performance coaching had significant effects on participants' occupational performance and self-efficacy. In child-related goals, there was also a statistically significant difference between two groups ( $p = 0.05$ ).

**Conclusion:** The results indicated that occupational performance coaching could be an effective intervention to increase the self-efficacy of mothers and improve the occupational performance of children and mothers of children with cerebral palsy.

This trial is registered at NCT02915926 at [clinicaltrials.gov](http://clinicaltrials.gov)

## Keywords

Cerebral palsy, children, mothers, coaching, occupational therapy

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## Introduction

Children with disabilities such as cerebral palsy (CP) require support to carry out their occupations, and mothers of these children are usually the main caregiver (Ahmadi Kahjoogh et al., 2016a). Mothers of children with CP often spend less time participating in meaningful occupations that satisfy personal, health and societal needs and experience stress, time pressures and poor self-efficacy (American Occupational Therapy Association, 2014; Backman, 2004; Giallo et al., 2011; Mobarak et al., 2000). As mothering of a child with a disability such as CP is a time- and energy-consuming occupation, the mothers may experience occupational imbalance and disrupted occupational performance (Donovan et al., 2005). Occupational imbalance, that is, the subjective perception of not having a reasonable amount of time for both obligatory and discretionary activities, can lead to the experience of stress and dissatisfaction (Håkansson and Ahlborg Jr, 2017). Mothers of children with CP usually spend more time caring for their children than mothers of typically developing children (Rassafiani et al., 2012). This can in turn affect their ability to fulfill meaningful activities and roles or their occupational performance (Townsend and Polatajko, 2013).

In the last decades, occupational therapists have paid special attention to family-centered interventions (King et al., 2004). Most family-centered interventions

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have been offered in the form of home programs, in which parents (usually mothers) were trained in specific techniques to care for their children (Novak et al., 2009). In these cases, mothers are dependent on the therapists to find solutions for their child.

As an alternative to therapist-led interventions, coaching principles are starting to be used in occupational therapy to provide a parent-directed approach. Coaching has been identified as an enabling skill in occupational therapy that involves a positive, strength-based collaboration to promote achievement of personally identified goals (Townsend and Poaltajko, 2013). Coaching is designed to enhance the performance of individuals by helping them develop skills to manage their own lives. A variety of coaching approaches such as the Contextual Intervention (CI) (Dunn, et al., 2012), Early Start Denver Model (ESDM) (Vismara and Rogers, 2008), Partnering for Change (P4C) (Missiuna et al., 2012) and Occupational Performance Coaching (OPC) are used by occupational therapists who work with mothers of children with occupational performance issues (Graham et al., 2009). Common elements of these approaches include education, goal-setting and problems-solving; however, they differ in the degree to which the therapist directs each of these components (Kessler and Graham, 2015). Several of these approaches were designed for parents or caregivers of children with specific conditions such as developmental coordination disorder and autism spectrum disorder (CI, ESDM and P4C). However, OPC does not focus on a specific condition or disability; it is designed to improve the occupational performance of parents of children with occupational performance challenges (Graham et al., 2010; Graham et al., 2009). Thus, it may be suitable to use with mothers of children who have CP.

OPC is an occupation-based, solution-focused, family-centered intervention that consists of three main domains: emotional support, information exchange and a structured process (Graham et al., 2010). Emotional support involves interactions between the mother and therapist that include guidance, encouragement and intentionally listening. During information exchange, the therapist and parent collaboratively share information acknowledging the parent's experiences and knowledge. The structured problem-solving process provides a format whereby the parent and therapist explore options for chosen goals, plan actions and check the results of actions together. The goals are selected by the mother and reflect her concerns about herself and her child (Ahmadi Kahjoogh et al., 2016b). To explore options, Collaborative Performance Analysis (CPA) is used. CPA involves guiding the parent to explore what is currently happening, what they would prefer to happen, potential facilitators and barriers, and their need to plan and take actions to achieve goals (Graham and Rodger, 2010). Use of this problem-solving format promotes a sense of control for mothers and provides motivation as they progress toward achievement of their goals (Graham et al., 2014, 2015). In this way, OPC promotes self-efficacy, defined as confidence in the ability to

use skills and accomplish tasks, which is important for taking action to overcome problems (Bandura, 1980).

There is preliminary evidence, using descriptive case study and time series design, to support the effectiveness of OPC in improving mothers' occupational performance and self-competence. One case study explored the efficacy of OPC with three mothers who had children without formal medical diagnoses. Results showed that OPC led to positive changes in both performance and satisfaction of the mothers. Mothers also reached expected levels identified by goal attainment scaling (GAS) for all goals (Graham et al., 2010). In a time series design they used the Canadian Occupational Performance Measure (COPM), GAS and the Parenting Sense of Competence Scale to identify changes. The mothers showed significant improvement with all mother- and child-related goals. The authors also reported that the mothers could use it to solve other problems in different circumstances (Graham et al., 2013).

OPC had not previously been tested with mothers of children with CP. The main objective of this study was to evaluate the effectiveness of OPC for improving the occupational performance of mothers of children with CP through testing the following hypotheses:

1. Mothers of children with CP who receive OPC will show more improvements with perceived performance and satisfaction with performance on self-identified goals compared to those receiving standard care.
2. Mothers of children with CP who receive OPC will show more improvements with perceived self-efficacy compared to those receiving standard care.

## Method

### Design

A parallel single blind randomized controlled trial was conducted. The intervention group received OPC plus standard occupational therapy services and the control group received the standard occupational therapy.

### Participants

Mothers of children with CP who were receiving care in an occupational therapy center were screened for inclusion and exclusion criteria. We sought to recruit 30 mothers. Inclusion criteria for mothers were: aged between 25 and 50 years and to be able to read and write. Mothers in this age group would be similar in terms of employment. Inclusion criteria for children were: aged 5–11 years, cognitive level above 70 according to the impairment form of the Study of Participation of Children with Cerebral Palsy Living in Europe (SPARCLE) (with a score of 70 or above, mothers confirm that their children could learn as well as other children of a similar age and play with peers; Gunel et al., 2009), and a diagnosis of CP. SPARCLE is a quick cognitive screen of children based on their mothers' reports. We chose children who had the capacity to learn

for this study to decrease variability between groups. Mothers were excluded if they were responsible for providing care to another disabled person, had more than one child with a disability or had severe depression according to the Depression, Anxiety and Stress Scale (Asgharimoghadam et al., 2008). Children were excluded if they had a comorbid psychiatric diagnosis or learning disability. All participants provided written informed consent.

### Sample size

A sample size of 30 (15 per group) was determined to allow testing at  $\alpha=0.05$  level with 80% power to detect a clinically significant difference of two points between groups on the COPM. An attrition rate of 10% was included in the sample size calculation.

### Outcome measures

**Primary outcome measure.** The COPM (Dehghan et al., 2014) was used as a primary outcome measure. The COPM measures the clients' performance and satisfaction with performance of goals in the areas of self-care, productivity and leisure. A rating scale from 1–10 is used. A change of two points or more over time is considered clinically significant (Law et al., 2005). The test–retest reliability for the COPM was 0.84 for performance and 0.87 for satisfaction when it was used with mothers of children with CP. The Persian version of the COPM had an acceptable content validity ( $80.95 \pm 0.222$ ) (Dehghan et al., 2014).

**Secondary outcome measure.** The Sherer General Self-efficacy Scale measures self-efficacy on a five-point rating scale. It consists of 17 items, with higher scores indicating better self-efficacy. The internal consistency of it has been reported to be 0.86 and the test–retest reliability was 0.76 (Asgharnejad et al., 2006). Construct validity has been proven by correlation with personal characteristics such as internal–external control and self-esteem (Sherer et al., 1982).

### Procedure

After primary screening (SPARCLE and Depression, Anxiety and Stress Scale) by a research assistant and obtaining informed consent, the outcome measures were administered by an occupational therapist who was blind to the groups and not involved in the child's current care. Pre-intervention, each participant was asked to select three goals using the COPM; one related to her own needs (mother-related goal) and two related to the needs of her child (child-related goals). They also completed the Sherer General Self-efficacy Scale. After completing the outcome measures, the participants were randomly assigned to one of the groups. For randomization, participants were asked to select an envelope from among randomly arranged sealed envelopes. Each envelope contained a letter to

indicate group assignment: the letter A for the intervention group or B for the control group.

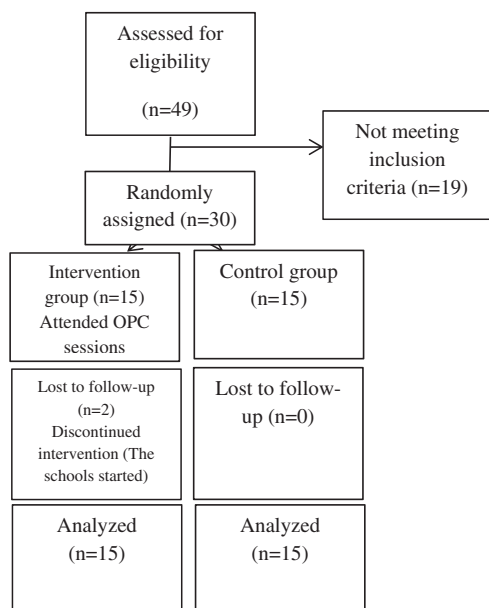
Participants in the intervention group received OPC as well as usual occupational therapy services related to their child's needs. Mothers in the control group only received usual occupational therapy services. Usual care consists of Neuro-developmental Treatment (NDT) sessions for the child provided 1–2 times per week, with training for parents in how to move and position their children at home. All therapists were trained at the master's level in occupational therapy and had been trained in NDT.

Intervention group participants took part in OPC sessions with the first author, who had five years' experience working with mothers of children with CP. The first author (who delivered the OPC) learned about the application of OPC through reading articles and book chapters on OPC as well as a manual developed for the use of OPC with people who have experienced stroke (OPC-Stroke). She also sought guidance periodically from the developer of OPC-Stroke. Prior to this study, we conducted a pilot study with one mother participant. During the pilot study, the first author received regular feedback from the developer of OPC-Stroke to enhance her competence in delivery of the approach.

OPC sessions were provided once per week for 10 weeks or until participants achieved their goals, according to the process outlined by Graham et al. (2009). In the sessions, the participant was first asked to describe the current situation related to the goal in order to provide a complete picture. This was followed by a collaborative performance analysis process whereby the participant was guided to find a practicable way to resolve the problem. As needed, the goal was broken down into small, attainable steps to promote success. After 10 weeks, the blind assessor asked participants in both groups to complete the outcome measures again (COPM and Sherer General Self-efficacy Scale). All participants completed the post-test after 10 weeks regardless of whether goals had been achieved earlier. The trial number is NCT02915926 at [clinicaltrials.gov](http://clinicaltrials.gov).

### Data analysis

Analysis of Covariance (ANCOVA) (Rosner, 2011) was used to compare the means of the COPM and Sherer General Self-efficacy Scale between the two groups. Scores at pre-test were used as a covariate and groups considered as a fixed factor. Significance was considered at a level of .05. Effect sizes and 95% confidence intervals (CIs) were calculated (Lakens, 2013). We used an intention to treat paradigm. When data was missing at post-test, the pre-test score was used. Intention to treat analysis was used whereby participants were analyzed in the group to which they were originally assigned whether they completed the intervention or not (Hollis and Campbell, 1999). Paired *t*-test and Wilcoxon signed ranks test were also used to analyze the within-group data (Imam et al., 2014). Data were analyzed using Statistical Package for the Social Sciences (SPSS) Version 22 (IBM, 2014).



**Figure 1.** Flow of participants through the trial.

## Result

### Participants

Forty-nine mothers of children with CP were screened by the research assistant. Nineteen did not meet inclusion criteria, leaving the 30 participants who were randomly assigned to the groups (Figure 1).

On average, participants in the intervention group participated in the weekly OPC session for six weeks with a range of 2–10 weeks/sessions. Two participants were lost to follow-up because of the child starting school and an increase in the participants' responsibilities at home. In both cases the participants could no longer attend the clinic regularly.

Table 1 shows the demographic characteristics of the participants of each group. There were no significant differences between the groups on any main baseline assessments (See Table 1).

### Canadian occupational performance measure

Self-care goals related to the child, such as independent dressing or toileting, made up 50% of the identified goals. Thirty percent of the goals were related to the mother's productivity, such as washing the dishes without pain. The remaining 20% were leisure-related goals such as going shopping. Eleven (73.33%) of the mothers in the intervention group showed a clinically significant increase of two points in their COPM scores (performance and satisfaction) and in their children's COPM scores. This improvement occurred in at least two of three goals. However, only one (6.66%) mother made an improvement in her performance, while three (20%) mothers in the control group made similar improvements with their satisfaction.

Compared with the control group, participants in the intervention group showed significantly increased COPM goal performance and satisfaction scores, with a large effect size ( $\eta^2_{\text{partial}} d=0.41$  and  $0.38$  respectively). When

**Table 1.** Participants' demographic variables at baseline.

Variable	Control group Mean $\pm$ SD (n)	Intervention group Mean $\pm$ SD (n)	p value
Child's age	7.56 $\pm$ 1.59 (15)	6.64 $\pm$ 0.97 (15)	0.07
Mother's age	38.22 $\pm$ 5.98	34.69 $\pm$ 4.29	0.28
Depression	17.12 $\pm$ 8.13	12.80 $\pm$ 8.06	0.89
Child's gender			
Male	(10)	(7)	0.26
Female	(5)	(8)	
GMFCS			
1	(7)	(3)	0.15
2	(2)	(0)	
3	(2)	(4)	
4	(4)	(6)	
5	(0)	(2)	
Mother's education			
Elementary school	(4)	(2)	0.063
High school	(6)	(5)	
Associate	(1)	(4)	
Bachelor	(3)	(3)	
Master	(1)	(1)	
Mother's job			
Housewife	(11)	(13)	0.50
Employee	(4)	(2)	

SD: Standard Deviation; GMFCS: Gross Motor Function Classification System; Associate: Two years' education in university.

specifically examining mother-related and child-related goals, the findings also showed the same pattern. Effect sizes showed a large effect of OPC for goal performance and satisfaction scores in mother-related goals ( $\eta^2_{\text{partial}} d=0.25$  and  $0.33$  respectively). Similarly, results indicated that there is a statistically significant difference between the two groups in child-related goals, with a large effect size of OPC for performance and satisfaction ( $\eta^2_{\text{partial}} d=0.35$  and  $0.41$  respectively) (Table 2).

The within-group data analysis showed that participants in the two groups experienced significant improvement with their performance and satisfaction scores for mother-related goals (intervention group,  $p < 0.001$ ; control group,  $p = 0.03$ ). Similar improvement was seen in the intervention group for child-related goals but not in the control group for performance ( $p = 0.56$ ) and satisfaction ( $p = 0.28$ ).

### Sherer general self-efficacy scale

Participants who received OPC had a statistically significant increase in self-efficacy compared to the control group, with a large effect size ( $\eta^2_{\text{partial}} d=0.7$ ) (Table 2).

There was no significant difference between the pre-test scores and the post-test ones in the control group ( $p = 0.10$ ), but there was in the intervention group scores ( $p < 0.001$ ).

## Discussion and implications

Participants who received OPC experienced an increase in their performance and satisfaction with their identified



**Table 2.** COPM and self-efficacy scores of mothers and children in both the groups.

Variable	Pre-test			Post-test				
	Control group Mean $\pm$ SD	Intervention group Mean $\pm$ SD	<i>p</i> value	Control group Mean $\pm$ SD	Intervention group Mean $\pm$ SD (95% CI)	<i>F</i> (df)	Observed Power	<i>p</i> value
COPM Performance	3.86 $\pm$ 1.61	3.75 $\pm$ 1.31	0.58	4.57 $\pm$ 1.34	6.68 $\pm$ 2.13 (6, 7.45)	19.32 (1)	98%	<0.001
COPM Satisfaction	3.39 $\pm$ 1.10	3.26 $\pm$ 1.58	0.11	4.26 $\pm$ 1.03	6.57 $\pm$ 2.08 (5.76, 7.44)	16.66 (1)	97%	<0.001
COPM Performance Mother	2.60 $\pm$ 1.91	4.33 $\pm$ 2.71	0.06	3.66 $\pm$ 2.25	7.20 $\pm$ 2.67 (5.54, 7.97)	9.44 (1)	84%	0.005
Child	4.50 $\pm$ 2	3.46 $\pm$ 1.46	0.14	4.76 $\pm$ 2.26	6.43 $\pm$ 2.56 (5.94, 7.88)	14.72 (1)	95%	0.001
COPM Satisfaction Mother	2.33 $\pm$ 1.83	3.66 $\pm$ 3.01	0.22	3.26 $\pm$ 2.28	6.93 $\pm$ 2.60 (5.44, 7.74)	13.71 (1)	94%	0.001
Child	3.93 $\pm$ 1.39	3.06 $\pm$ 1.80	0.33	4.50 $\pm$ 2.03	6.26 $\pm$ 2.46 (5.88, 7.57)	19.49 (1)	98%	<0.001
Self-efficacy	65.60 $\pm$ 8.93	61.66 $\pm$ 9.50	0.90	64.53 $\pm$ 8.14	70.80 $\pm$ 8.33 (70.71, 74.13)	63.63 (1)	100%	<0.001

COPM: Canadian Occupational Performance Measure; CI: confidence interval; df: degrees of freedom.  
COPM score range = 1–10, self-efficacy score range = 17–85.

goals compared to participants in the control group. Consistent with findings of previous studies (Graham et al., 2013, 2010), mothers in this study may have been more motivated to follow through on goals as they were treated as equal partners and selected the goals themselves (Graham et al., 2010); they were not passive recipients of the services. Selection of goals by the mother and active engagement in the problem-solving process to achieve these goals may be an important component of effective interventions. Novak et al. (2009) provided training on strategies to achieve family-selected goals for children with CP and found significant differences between the groups in their COPM scores.

It is interesting to note that child-related goals appeared to show more improvement than mother-related goals. These findings are similar to those of Graham and colleagues, who also found greater improvement in child-related goals (Graham et al., 2010). However, a subsequent study found that improvement occurred for both types of goals (Graham et al., 2013). In the current study, each mother had three goals, one of them related to their needs and two related to their child. Addressing two child-related goals may have taken more time and energy than the mother-related goal, resulting in the mother not having time to focus on the goal she chose for herself. Another consideration is that the child-related goals may be more valued by the mother; mothers may have a tendency to put their children ahead of themselves. Also, mothers are usually referred to occupational therapy because of their children's needs. This context may promote mothers to be more focused on goals for their children.

Stress experienced by mothers of children with CP tends to be rooted in their children's challenges

(Backman, 2004). Functional limitations experienced by children with CP, especially those related to the burden of caring, are predictors of stress for their mothers (Mobarak et al., 2000). Assisting mothers to overcome challenges related to caring for their children may facilitate their ability to address their own occupational performance and thereby create a better fit between their environment, their occupations and their own characteristics. Occupational therapists who work with mothers of children with disabilities can also assist mothers to understand the importance of maintaining their own occupational balance to decrease stress and promote their ability to continue to care for their children. This could be done through emphasizing mother-related goals.

While participants in the control group showed improvements in mother-related goals, these same improvements were not noted for the child-related goals. Goal-setting by itself may lead to improvements in performance and satisfaction with goals. This has been noted in other studies (Kessler et al., 2017). NDT emphasizes positioning of the child with CP with education of the mother on techniques to handle her child. This approach did not result in improvements for the child-related goals. This finding is not surprising given that NDT has not been shown to have an effect on daily activity and participation-related goals (Bar-Haim et al., 2010), which are the focus of OPC.

Participants in the intervention group demonstrated significant progress with their self-efficacy compared to the control group. During the OPC intervention, with guidance from the coach, the participants learned to find suitable solutions and use effective strategies to overcome their existing challenges. Strategies included changing the

manner in which they interacted with their children and modifying the environment to achieve their chosen goals. Occupation-based approaches that promote the development of the client's problem-solving skills may provide clients with knowledge and skills that may be generalizable. Evidence to support these types of interventions is growing (Kessler and Graham, 2015), creating an alternative to impairment-focused approaches.

Findings in this study of mothers' increased self-efficacy are consistent with the results of Graham and colleagues' study, where mothers who participated in the OPC sessions showed a significant increase in self-efficacy for parenting (Graham et al., 2013). Other coaching approaches used in occupational therapy have been shown to lead to increased self-efficacy. In a qualitative study by Foster et al. (2013), mothers identified a higher sense of self-efficacy and an increased mindfulness related to their experiences with coaching. Dunn and colleagues (2012) also reported increased competence of mothers after participating in their contextual intervention, which uses coaching principles (Dunn et al., 2012). Thus, coaching principles appear to help mothers of children with disabilities develop self-efficacy for addressing challenges faced by their children.

## Limitations

While the therapist in this study was knowledgeable about OPC and received feedback on her implementation of OPC, she was not formally trained in coaching, coaching principles and OPC. Therefore, adherence to the OPC approach cannot be confirmed. Future research should include a measure of treatment fidelity. Socioeconomic status of the participants was not considered in the study. However, this would be an important factor in the lives of mothers of children with CP and should be considered in future studies. Future research could also consider examining the effect of the child's physical functioning and behavior on outcomes. For example, the Gross Motor Function Classification System (GMFCS) (Gunel et al., 2009) could be used to specifically examine the impact of motor abilities on outcomes. Findings of the study may not be transferable to children of other age groups or those with differing learning abilities or comorbid diagnoses.

## Conclusion

Occupational performance coaching can be an effective intervention for mothers of children with CP for improving their occupational performance and general self-efficacy. OPC can assist mothers of children with CP to develop the knowledge, skills and self-efficacy required to resolve issues by themselves. Therapists working with mothers of children with CP should consider incorporating OPC into their practice.

It is noted that this study focused on mothers of children with CP. Fathers may respond differently to OPC. Future studies needed to explore the impact of

OPC with fathers of children with CP or other diagnoses.

### Key findings

- OPC can improve the occupational performance and self-efficacy of mothers of children with CP.
- Mothers of children with disabilities may need encouragement to prioritize their own goals alongside those they have for their child.

### What the study has added

OPC is an occupation-based versus an impairment-based approach. This research offers support for the use of occupation-based approaches that promote client responsibility for goals and actions.

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## Research ethics

Ethical approval (reference number: IR.USWR.REC.1395.148) was obtained on 10 September 2016 from the Ethics Committee for Human Experiments, University of Social Welfare and Rehabilitation Sciences (USWRS), Tehran, Iran.

## Consent

This study focused on occupational performance coaching of mothers of children with CP. The mothers provided written informed consent as participants. Their children were not directly involved in the coaching sessions.

## Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship and publication of this article.

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## Contributorship

Mina Ahmadi Kahjoogh and Mehdi Rassafiani researched literature and applied for ethical approval. All authors contributed to the methodology of the study. Mina Ahmadi Kahjoogh, Mehdi Rassafiani and Akbar Biglarian carried out the statistical analysis and all authors interpreted the data. Mina Ahmadi Kahjoogh wrote the first draft of the manuscript and all authors reviewed. Dorothy Kessler edited the final version of the manuscript.

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