

# Effect of the Parenting Preparation Program on Maternal Role Competence: A Systematic Review and Meta-Analysis

## Abstract

**Background:** The maternal sense of competence refers to the mother's sense of ability to care for the baby. Maternal competence can affect the mother's parenting capacities. Maternal preparation programs are aimed to increase mothers' knowledge and improve their maternal competence. This systematic review and meta-analysis investigated the effect of a maternal preparation program on maternal role competence. **Materials and Methods:** A systematic search was conducted using the following MeSH terms: "education", "program", and "parenting sense of competence" in databases including PubMed, Web of Science, Cochrane Central, and Scopus, from inception till July 2022. All Randomized Controlled Trials (RCTs) published in any language were extracted. Articles were screened based on predefined inclusion and exclusion criteria. The quality of the included articles was assessed by two qualified reviewers based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). **Results:** Of the 170 published works that were retrieved in the initial stage, five articles including 647 first-time mothers were analyzed. A meta-analysis showed that parenting preparation program interventions increased maternal role competence in first-time mothers as opposed to those who received routine care Mean Difference (MD) = 3.31, 95% Confidence Interval (CI) [2.07, 4.55]. **Conclusions:** The results of this study encourage health policymakers to develop maternal preparation programs for first-time mothers and their children.

**Keywords:** Competence, education, maternal, program, role

## Introduction

The maternal sense of competence refers to the mother's sense of ability to care for the baby,<sup>[1]</sup> and it reflects women's perceptions of their parenting skills.<sup>[2]</sup> The feeling of competence in maternal role has a profound effect on the quality of mother–infant interactions,<sup>[3]</sup> bringing about significant effects on various dimensions of neonatal development.<sup>[4]</sup> Factors such as maternal educational attainment, maternal age, employment, income status, obstetrics complications, the health status of the infant, and the mood of the infant all affect the competence in the mother's role. Of course, previous studies have come up with contradictory results.<sup>[5,6]</sup> Acquiring competence in the role of mother is one of the most important components of maternal adjustment at the time of transition to motherhood, which has enormous effects on the quality of parenting, and consequently, the psychosocial development of the child.<sup>[2,7]</sup> Maternal self-reliance and

ability are elevated after birth and will reach the highest rate four months after delivery.<sup>[8]</sup> Lack of awareness of the role of motherhood and inadequate care of the mother and baby are the most important factors in refusing motherhood.<sup>[9]</sup> According to Meighan and Mercer, the process of role performance involves attaining maternal role and acquiring the ability to perform maternal behaviors.<sup>[10]</sup> This process starts with the birth of each child and has four stages: (a) the waiting stage: getting ready for the baby during pregnancy; (b) the formal stage: increasing attachment to the baby; (C) the informal stage: achieving more confidence to take care of the baby; and (d) the personal stage: developing a sense of competence that is determined by the attainment of maternal identity.<sup>[11]</sup>

Basically, parenting education is designed to help pregnant women and their partners prepare for the parenthood. This type of education may be offered before or after birth and covers elements of pregnancy,

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childbirth, and parenting.<sup>[12]</sup> Parent education is defined as a process in which insights, perceptions, and attitudes are expanded, and knowledge and skills are acquired with regard to the development of the relationship between the parents and their children.<sup>[13]</sup> However, the effect of parturition training classes to prepare mothers for the role of motherhood and infant care has been criticized widely.<sup>[14,15]</sup> Azmoudeh *et al.*<sup>[16]</sup> (2015) stated that the mother role promotion campaign contributes to maternal competence and can strengthen the maternal role in primiparous women. Özkan and Polat<sup>[17]</sup> (2011) showed that maternal identity education based on Mercer's theory was effective in attaining motherhood and maternal perception of nulliparous women. Other studies on this topic have reported similar results.<sup>[18-20]</sup> On the other hand, a review by Fontein-Kuipers *et al.*<sup>[20]</sup> (2014) found that educational intervention had no beneficial effect on reducing maternal stress. Also, Ngai *et al.*<sup>[21]</sup> (2009) reported that maternal training programs do not have any impact on maternal competence.

Despite a number of RCTs conducted on this topic, there is still no consensus on the effects of maternal preparation programs on maternal role competence. Thus, this systematic review aimed to assess the effect of parenting preparation programs on maternal role competence.

## Materials and Methods

This systematic review was carried out following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist.<sup>[22]</sup> We extracted all Randomized Controlled Trials (RCTs) with no limitations regarding language. The studies were searched in PubMed, Google Scholar, Scopus, Web of Science, Iran Medex, SID, and Magiran from inception till July 31, 2022. The search strategy was done using MeSH terms (“education OR training” AND “programs” OR “workshop OR educational” AND “activities” OR “educational” AND “activity” OR “literacy” AND “program” OR “learning” OR “Prenatal Education” AND “parenting sense of competence scale” OR “parenting sense of competence”). In order to define the search string, PICO (Population, Intervention, Comparison, and Outcome) framework was used. The inclusion criteria were first-time mothers, age >18 years, singleton pregnancy, intended pregnancy, healthy born baby, using the Parenting Sense of Competence Scale (PSOC) for comparison, no drug abuse, and no history of mental or physical diseases in the parents. Exclusion criteria were preterm labor, vaginal bleeding, chronic maternal diseases, and medical problems such as gestational diabetes mellitus (GDM), and preeclampsia. The frequency of educational interventions on maternal role ranged from three to four sessions during pregnancy and postpartum, and session length was from 21 to 90 min. Two studies provided psychological training (PT),<sup>[18,19]</sup> two involved interpersonal psychotherapy (IPT),<sup>[23,24]</sup> and one provided education on

the baby's moods, behaviors, and communication signs in addition to routine care.<sup>[25]</sup> In the reviewed articles, parenting preparation programs were offered during pregnancy and postpartum. The results of the included studies were evaluated up to 6 weeks after the intervention. Control groups received routine antenatal care or standard care. The search results were imported into Covidence, and duplicates were removed.

Two reviewers (FT and ZA) independently screened the titles/abstracts of full-text articles based on inclusion criteria. Disagreements were resolved through discussion with or the assistance of a third author (NJ). Another reviewer (MS) checked the accuracy of the items extracted. Then, two research team members (FT and MD) assessed the risk of bias in the selected studies using the PRISMA checklist independently and carefully.<sup>[22]</sup> Using a pre-designed data extraction sheet, two reviewers (FT and ZA) extracted the data from the included studies independently. The items extracted from each included article included article details (publication date, geographic location, participant inclusion criteria) participant characteristics, intervention details (type, duration), outcome details, and bias assessment details. The protocol of the study was registered in PROSPERO (Ref No: CRD42022286448). The risk of bias was evaluated by the methods introduced by Cochrane Collaboration. The risk of bias was evaluated in the following domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessors, incomplete outcome data, selective outcome reporting, and other biases<sup>[26]</sup> [Figures 2 and 3]. Clarification to assess the differences in parenting sense of competence in two groups, mean differences (MD) and 95% Confidence Intervals (CI) were used. Significant statistical differences were reported using the *p* value of the test. Heterogeneity among the groups was evaluated by the *I*<sup>2</sup> statistic and Chi-squared test. Using the generic inverse variance method, we calculated standardized mean differences (SMD) in random effects models for pooled results.

## Ethical considerations

This research has been approved by the Ahvaz Jundishapur University of Medical Sciences ethics committee (Ethical code: IR.AJUMS.REC.1400.472). Researchers tried to act in an unbiased way to analyze the retrieved data of articles.

## Results

Based on our search strategy, 168 records were found through the database search. Two more articles were identified through weekly searching of other sources. After the removal of 66 duplicates, there remained 104 records of which 90 were removed for the following reasons: 70 studies were irrelevant, and 20 were protocols. Out of the 14 records included for screening, nine were excluded for the following reasons: one was a presentation for one of

the included studies, four were abstracts with no full-text available for quality assessment and data extraction, two included inadequate patient population, and two were identical. Finally, we included five studies<sup>[18,19,23-25]</sup> involving 647 women [Figure 1]. The included studies had been conducted between 2012 and 2018. Two studies were conducted in China,<sup>[23,24]</sup> one in Taiwan,<sup>[25]</sup> and two in Iran.<sup>[18,19]</sup> Table 1 shows the characteristics of the included studies in the systematic review.

### Risk of bias in the included studies

For RCTs, the risk of bias was evaluated by the methods introduced by the Cochrane Collaboration. Two reviewers (FT and ZA) assessed the quality of the included studies. Disagreements were resolved by discussion or involvement of a third reviewer (NJ). The following areas were covered using 27 questions in cohort studies: ten

questions for assessing reporting bias, three for assessing external validity, seven for evaluating internal validity, six for assessing (selection bias) and one for assessing the power of the study.<sup>[27]</sup> The total quality score was classified as follows: <14 = poor, 15–19 = fair, and >20 = good.<sup>[28]</sup> Five trials were at low risk of selection bias in terms of using an adequate random sequence generation method. However, four trials were at low risk of allocation concealment bias. Only one trial reported no information about the intervention, thus it was rated as having an unclear risk of selection bias. Only one trial had high risk in terms of performance bias [Figures 2 and 3].

### Outcomes

#### Maternal role competence

Four RCTs including 525 participants reported

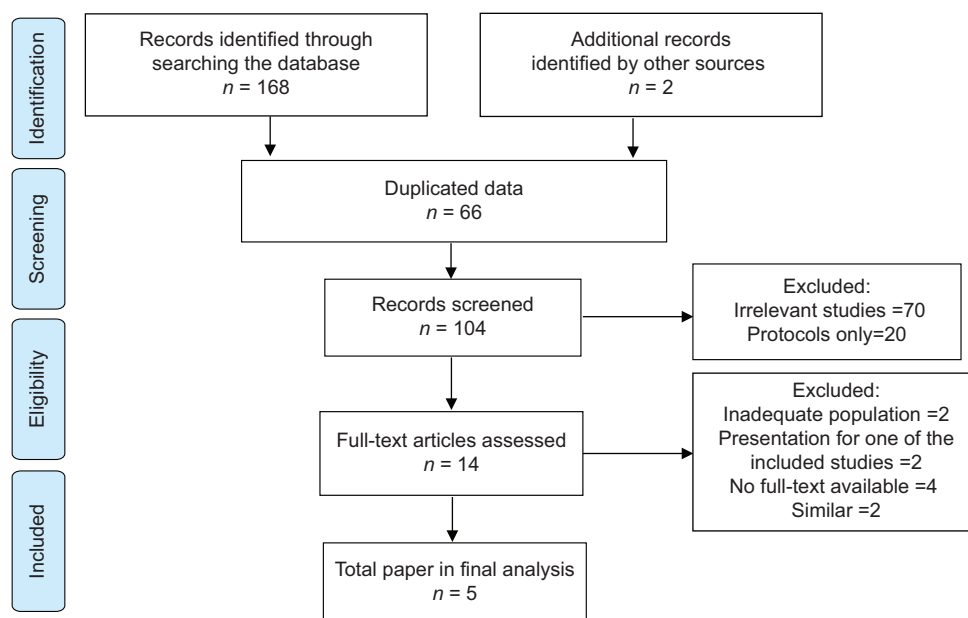


Figure 1: PRISMA chart of the study

Table 1: Included studies characteristics

| Authors (year)                           | Country/ Sample size | Follow up | Intervention  | Results   |
|--|----------------------|-----------|---|---|
| Kordi <i>et al.</i> <sup>[19]</sup> 2018 | Iran/122             | 6w*       | PT**** in three sessions. The teaching of labor stages and methods of pain relief for 21 minutes in the first training sessions was given by the researcher. PT has been offered through lectures, discussion, role play, and whiteboard. | Improved maternal role competence.                              |
| Chung <i>et al.</i> <sup>[25]</sup> 2018 | Taiwan/81            | 4w        | In addition to routine care, the intervention included education through a 40-minute videotape of the baby's moods, behaviors, and communication signs and a booklet on playful practices.  | No significant difference between the two groups.               |
| Kordi <i>et al.</i> <sup>[18]</sup> 2016 | Iran/70              | 4w        | PT was offered in groups of 4-7, within 4 sessions at GA**: 34, 35, and 36, and before discharge.   | A significant difference in increased maternal role competence. |
| Gao <i>et al.</i> <sup>[24]</sup> 2015   | China/180            | 6w        | A 1-hour session of IPT*** before discharge and one telephone follow-up till 2 weeks after discharge.   | Improved maternal role competence                               |
| Gao <i>et al.</i> <sup>[23]</sup> 2012   | China/194            | 6w        | IPT including two 90-min antenatal classes and a telephone follow-up until two weeks after childbirth.  | Significant improvement in maternal role competence.            |

W\*: week; GA\*\*: gestational age; IPT\*\*\*: interpersonal psychotherapy; PT\*\*\*\*: psychological trainings

|            | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants and personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Other bias |
|------------|---|---|---|---|--|--------------------------------------|------------|
| chung 2018 | +   | ?                                       | -   | ?   | +  | +                                    | ?          |
| Gao 2012   | +   | +                                       | +   | ?   | +  | +                                    | ?          |
| Gao 2015   | +   | +                                       | +   | +   | +  | +                                    | ?          |
| kordi 2016 | +   | +                                       | ?   | ?   | +  | +                                    | ?          |
| kordi 2017 | +   | +                                       | ?   | +   | +  | +                                    | ?          |

Figure 2: Risk of bias summary of included studies

pre-intervention perceived maternal sense of competence scores measured by the PSOC.<sup>[18,23-25]</sup> The between-group analysis showed no significant difference in the intervention group compared to the control group in terms of the maternal sense of competence (MD) = -0.36; 95% CI: -1.22–0.49;  $p = 0.41$ ) [Figure 4]. One article did not have the pre-test data.<sup>[19]</sup> The meta-analysis of five RCTs with 647 participants showed a statistically significant beneficial effect of parenting preparation program interventions on the maternal sense of competence (MD = 3.31; 95% CI: 2.07–4.55;  $p < 0.001$ )<sup>[18,19,23-25]</sup> [Figure 5].

## Discussion

The findings of this systematic review and meta-analysis showed that a maternal preparation program for first-time mothers could improve the mean score of maternal role competence. The maximum follow-up time in the studies was 6 weeks. According to Mercer (2006), maternal role competence refers to a kind of satisfaction and pleasure that a woman experiences while interacting with her infant and performing her duties as a mother after the birth of her baby.<sup>[11]</sup> She also maintains that the process of assuming the maternal role begins during pregnancy and continues 4 to 6 months after delivery.<sup>[29]</sup>

Two RCTs conducted by Gao *et al.*<sup>[23,24]</sup> (2012, 2015) showed that the interpersonal psychotherapy program (IPT) could substantially be of benefit to primiparous Chinese women and improve maternal role competence. The IPT focuses on two areas, namely

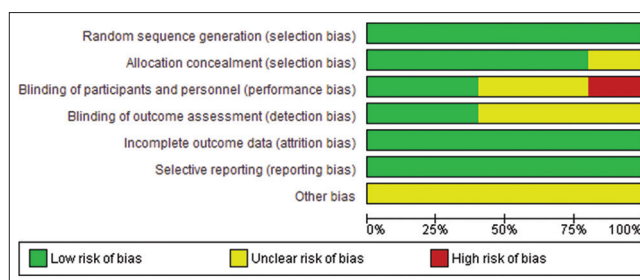


Figure 3: Risk of bias summary of included studies

the conflicts in the relationship in which the mother is involved and helping the mother to appropriately use social support until she can better cope with crises causing stress.<sup>[30]</sup> Chan believes that the IPT program framework is acceptable to the Chinese culture because interpersonal and family relationships are highly emphasized in the Chinese society.<sup>[31,32]</sup> It has been suggested that when it comes to designing educational programs, cultural values and beliefs should be taken into consideration in order to equip women with the necessary skills and strengthen their sense of competence.<sup>[1]</sup> Kordi *et al.*<sup>[18,19]</sup> (2018, 2016) conducted two RCTs in Iran to evaluate the effect of prenatal psychological training on the maternal role competence of primiparous women. The intervention group in their study received childbirth psychology training based on Rosenbaum's theory in three sessions during their pregnancy. According to the results, the intervention and control groups were significantly different in terms of their mean scores of maternal role competence ( $61 \pm 10$  vs.  $54.5 \pm 12$ ). Notably, the PSOC score in the intervention group showed a higher increase compared with other studies. Rosenbaum's theory provides a framework for developing a parturition psychoeducation program that includes the use of positive self-learning, problem-solving, delayed satisfaction, and perceived self-efficacy.<sup>[33]</sup> On the other hand, Chung *et al.*<sup>[25]</sup> (2018) showed that the score of maternal role competence during the first week, and the third, sixth, and ninth months after delivery was not significantly different between the two groups. However, a positive change was observed in maternal competence in the twelfth month after birth in the case group. Their results revealed that parenting education affected role competence in the long run. They argued that under the influence of humility and modesty in Taiwanese culture,<sup>[34]</sup> women underestimate themselves and need more time to achieve motherhood competence than motherhood skills.<sup>[2]</sup> In the meantime, the researchers recommended that training activities, evaluation, and promotion of maternal competence begin for women in early pregnancy because women who believe in coping with their maternal role have more maternal competence during pregnancy and the early stages of childbearing.<sup>[19,35]</sup> Chen concluded that maternal preparation programs could be offered in the 32<sup>nd</sup> to



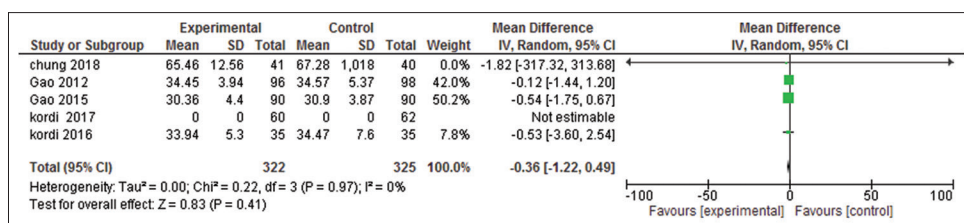


Figure 4: Mean of comparison pretest of Parenting Sense of Competence Scale (PSOC) in two groups

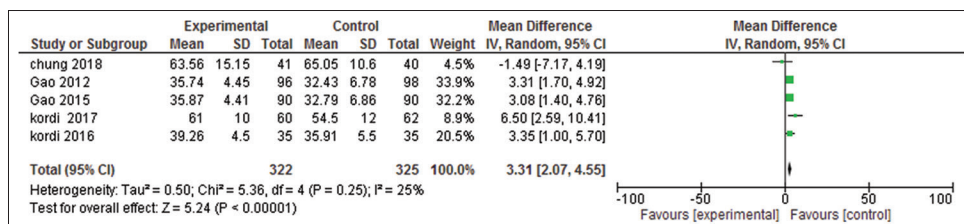


Figure 5: Mean of comparison posttest of Parenting Sense of Competence Scale (PSOC) in two groups

34<sup>th</sup> weeks of pregnancy to increase maternal skills and thus strengthen the sense of maternal competence.<sup>[36]</sup> Past research has shown that during the perinatal period, maternal stress could be decreased by increasing the mother's skills and strengthening them to achieve a sense of competence.<sup>[8]</sup> In addition, women who were less stressed about the transition into motherhood were less likely to be susceptible to depression.<sup>[37,38]</sup> A negative correlation was observed between depression scores and PSOC and interaction scores. Higher interaction scores are associated with higher PSOC.<sup>[39]</sup> Interventions to foster maternal competence should include efforts to equip them with the skills needed for the challenges of early motherhood. However, current approaches to birth classes concentrate on improving knowledge about pregnancy, delivery, and infant care skills, with limited coverage of the mother's sense of competence in the early days of motherhood.<sup>[40,41]</sup> Mercer believes that the design of most programs presented during pregnancy does not have a sound theoretical basis as well.<sup>[42]</sup>

It is imperative that women who feel incompetent about their parenting role be given the opportunity to practice motherhood skills and play a role in prenatal training classes. Improving perinatal health has lasting benefits both for the mothers and the health care system by saving treatment costs. Despite the importance of the need for education during prenatal care to improve the skills of women, little attention has been paid to the positive development of maternal competence. Maternal preparation programs are necessary for mothers and babies, and health providers can contribute to improving their health by relying on such programs.

This systematic review is worthwhile in that its protocol has been registered in PROSPERO. Another strength is the inclusion of only RCTs in this systematic review and meta-analysis. Also, the heterogeneity of the

included studies was low, and all results were reviewed consistently by at least two reviewers. There were of course some challenges in the present review study that need to be taken into account. The five articles that were reviewed included only Chinese, Taiwanese, and Iranian women. Therefore, the results may not be generalizable to all mothers due to the influence of cultural, religious, and attitudinal factors on maternal role competence. The maternal preparation programs of the reviewed studies were different, and the researchers had not explained standard or routine care adequately, which might affect outcomes. Also, there was no access to the full texts of some studies, while their titles and abstracts were appropriate for inclusion in the review.

## Conclusions

It seems that parenting preparation programs have potential benefits of promoting maternal competence. For this purpose, it is necessary to increase the knowledge and skills of parenting, create educational opportunities, and provide support resources for them. Future studies should be conducted in health care systems to provide a basis for understanding the needs of new mothers from a broader international perspective. On the other hand, the role of policymakers, midwives, and health care providers in incorporating these concepts into educational programs and support services with content that meets the psychological needs of first-time mothers is evident.

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## Conflicts of interest

Nothing to declare.

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