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The effectiveness of learning portfolios in learning participation and learners' perceptions of skills and confidence in the mother of preterm infant

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ABSTRACT

Objective: The purpose of this study was to investigate the effectiveness of preterm infant learning portfolios in enabling mothers to develop infant care knowledge and skills, as well as confidence in their abilities.
Design: This study used a quasi-experimental design.
Setting and participants: The sample consisted of 52 mothers with preterm infants recruited at a neonatal intermediate unit of a medical centre in central Taiwan. Among those, 26 participants in the control group received regular health education and 26 participants in the experimental group received learning portfolios and regular care.
Intervention: The Preterm Infant Care Learning Portfolio (PICLP) is a semi-structured learning portfolio which was provided by nurses. Intervention started with 15 min of instructions on how to use PICLP, including a list of learning task and methods of self-assessment. Follow-up sessions of 5–10 min were conducted after each learning task. The frequency of learning skills could be adjusted depending on participants' learning needs.
Measurements: Self-administered questionnaires regarding knowledge of and skills in preterm infant care and maternal confidence were used to evaluate the effectiveness of the intervention; the questionnaires were conducted before the intervention, 1 day before discharge and 1 month after discharge. We also tracked the frequency with which participants attended instructional sessions before discharged.
Findings: Mothers' preterm infant care knowledge and skills and confidence improved in both groups after the intervention. The experimental group showed greater improvement than the control group by post-test 2; there was no statistical difference between groups at 1 day before discharge and 1 month after discharge. However, participants in the experimental group came for instructional sessions on baby care for more frequently than the control group. The frequency of learning sessions attended was a predictor of improved scores of the skill assessment before discharge.
Conclusions: Both programmes led to improvements in preterm infant care knowledge and skills and maternal confidence. Giving mothers learning portfolios appears to stimulate significantly greater participation in hospital-based instructional programmes, which should in turn lead to greater long-term retention of learning. The learning portfolios may have an additional benefit in promoting acquisition of care abilities for mothers with preterm infant before hospital discharge and application of these abilities at home.
Implication for practice: At-home care for preterm infants requires specialized care skills and confidence. Learning portfolios can be used as an effective learner-centred strategy for teaching these health care abilities.

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Introduction

In Taiwan, the incidence of preterm births among all newborns has been approximately 8–10%, and 80% of neonatal deaths can be attributed to preterm births (Lawn et al., 2013). Owing to the unpredictable physiological changes experienced by premature infants, it is essential for caregivers to have sufficient care skills and confidence before discharge. The necessary knowledge and skills including CPR, choking, kangaroo care, infant massage, oxygen use, knowing the babies' behaviours and abnormality, and feeding to stabilize preterm infants' physiological development have long been a crucial concern in health education (Brett et al., 2011; Chan et al., 2016; Field et al., 2010). Health education could increase mothers' knowledge, care abilities and self-confidence, which will subsequently assist them in handling the pressures of caring for a fragile baby at home (Brett et al., 2011; Chen, 2011; Benzies et al., 2013).

Many studies have examined forms of preterm infant discharge education or other intervention programmes (Brett et al., 2011; Chen, 2011; Benzies et al., 2013; Aagaard and Hall 2008). Furthermore, the use of mobile tools (Hayes et al., 2014), multimedia (Yeh, 2005), and discharge preparation (Cockcroft, 2012) have achieved higher attachment in parenting, improved mothers' competence in caring for babies, reduced mothers' postpartum depression (Ghorbani et al., 2014; Kaaresen et al., 2006) and improved maternal confidence. Although these studies have examined effective methods in preterm infant discharge education, they have not examined ways to maintain care quality at home after discharge. It is thus important to develop health education approaches that do not rely on health care professionals in hospitals but emphasize care after returning home.

One such strategy involves the use of learning portfolios, which are defined as a collection of evidence that demonstrates the learning acquisition process, along with understanding and learning achievements (Alotaibi, 2012; Chou, 2009; Cangelosi, 2008). These processes can be recorded by using a learning tool with systematic and concrete objectives. A learning portfolio may contain objects, including documents, records, journals or diaries (Finlay et al., 1998). It is built to suit an individual's connotation of learning and the context of his/her development. Learning portfolios were originally used for collecting personal artwork. It was only in the 1990s that learning portfolios were used in the field of education as an important tool for teaching and assessing (Finlay et al., 1998; Parbossingh, 1996). Since then, learning portfolios have been applied successfully in academic fields (Jenkins, 2014; Buckley et al., 2009; Tahriri et al., 2014; Klenowski et al., 2006).

The use of learning portfolios is grounded in adult learning theory. Knowles et al. (2012) indicated that adult learning is problem-centred, intrinsically motivated, and connected to adults' daily tasks and social roles (Knowles et al., 2012). Adults are autonomous learners, as they plan their own learning strategies and evaluate their own learning outcomes to complete tasks (Knowles et al., 2012). Thus, using learning portfolios enables them to systematically organize and document their progress and results (Cangelosi, 2008; Tahriri et al., 2014). In the health care field, such a tool can enhance learners' self-management and encourage the adoption of healthy behaviours (Jenkins, 2014; Knowles et al., 2012; Peterson et al., 2014).

Learning portfolios are built to suit individuals' preferred ways of learning and situational contexts (Alotaibi, 2012; Chou, 2009; Cangelosi, 2008) and are paired with individually based assessments (Parbossingh, 1996). Assessment is typically multidimensional, involving both learners and instructors as both need to clearly define evaluation standards at each stage of portfolio development (Parbossingh, 1996). Through this process, learners take responsibility for knowing where they are with regard to learning goals, learners broaden their view of what is being learned; learners can discover their strengths and weaknesses and then adjust their learning progress appropriately (Klenowski et al., 2006). Thus, the use of learning portfolios can enhance learners' self-reflection and self-evaluation as well as increase their motivation, confidence, and learning efficiency.

The formats of learning portfolios are as varied as the purposes they serve (Klenowski et al., 2006; Buckley et al., 2009). Literature shows the characteristic of learning portfolios include organized, individualized, selective, ongoing and reflective (Buckley et al., 2009). Semi-structured portfolio provides the learning topics and main projects, while learners can independently develop their own ideas and plan their contents and forms (Chou, 2009). The portfolios incorporate evidence of self-reflection, autonomy in the selection of contents, display of learner's activities, and information that illustrates growth over time. Learning portfolios are considered to be a type of working portfolio that can arouse reflection and emphasize an individual's learning in progress (Buckley et al., 2009).

Although many studies have shown the effectiveness of learning portfolios with respect to learners' knowledge, skills, and attitudes, most of these examined the acquisition of professional knowledge and higher education (Finlay et al., 1998; Parbossingh, 1996; Buckley et al., 2009: Klenowski et al., 2006). Only Washington and Moxley's (2004) study applied learning portfolios to patient health education. This study demonstrated the effectiveness of portfolios in changing learners' attitude towards drugs and reducing drug abuse. Similarly, preterm infant care requires a systematic learning process. The present study investigates the effectiveness of learning portfolios in leaners' participation, knowledge and skills of infant care, and maternal confidence among mothers of preterm infants.

Methods

Design

This was a quasi-experimental design using two groups non-concurrently with repeat measurements. To avoid the mutual confounding that might be caused from staff or participants in the two groups, data on the control group were gathered first, followed by data on the experimental group, which used learning portfolios. The outcome measurements included leaners' participation rate, knowledge and skills of infant care scales, and maternal confidence. The measurements were conducted before the intervention (pre-test), 1 day before discharge (post-test 1), and 1 month after discharge (post-test 2).

Participants

Subjects were recruited by purposive sampling of criteria including mother's (age 20 and above) of preterm infants (gestational age < 37 weeks and >28 weeks) at the neonatal intermediate unit of a medical centre in central Taiwan. Mothers who had a disability, cancer, or a psychiatric diagnosis or whose preterm infants had a congenital disorder were excluded from the sample. This study initially enrolled 62 participants (30 in the control group, 32 in the experimental group) but 10 withdrew because of deteriorating medical conditions or an inability to complete the post-test questionnaire. Thus, 52 participants (26 in each group) completed the study, giving a completion rate of 83.87%. The sample size was calculated using G*Power 3.1. With a mean difference of $\alpha = .05$ between the two groups and a power of .8, 52 participants (26 per group) were required to yield statistically significant result.

Intervention

The Preterm Infant Care Learning Portfolio (PICLP) was developed from a literature review and clinical experts' experiences. Each participant was provided with a semi-structured portfolio. The programme included instructions and discussions that included a learning record and