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## Parental satisfaction with infusion carrier in child care

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### Abstract

Family-centered care is the best method of child care, and the involvement of parents in child care brings positive results for both children and parents. During treatment, the child is carried by the caregivers/parents for various purposes, and holding the child while receiving the infusion is not easy. This study aims to evaluate the trial of the infusion carrier device in the Children's Ward. This type of research is a pre-experimental study with a post-test-only design. The study was conducted in the children's ward of Tugurejo Hospital, Central Java Province, Indonesia. Sixty children were sampled in the survey. Assessment of innovation products and parental satisfaction using a questionnaire. Data processing using SPSS with descriptive and Spearman's rho correlation test. The creation of innovative products from an infusion carrier combines a carrying device and an infusion carrier. The results show that from 6 aspects of parents' assessment of the infusion carrier tools measured on a scale of 1-5 (strongly disagree to agree strongly) obtained the average product characteristics (3.79), suitability (3.94), design (4.14), durability (4.17), shape (4.26) and performance (4.50). In addition, parents' satisfaction after using these innovative products from the dimensions of willingness to recommend (4.3), willingness to re-use (3.99), and conformity with expectations (3.37). There is a relationship between product innovation and parental satisfaction, indicating positive values of  $p < 0.001$  with a correlation coefficient of 0.630. Infusion carrier innovation is positively accepted and increases parental satisfaction.

**Keywords:** Infusion Carrying; Parental Satisfaction; Child Care; Innovation Products

### 1. Introduction

Infusion is a medical procedure that is often performed in child care. Infusion is an action performed to provide fluids, drugs, nutrients, and vitamins for patients with fluid or nutritional disorders. This procedure can cause discomfort and anxiety before the process, especially for children undergoing treatment in the hospital. Besides, that infusion installation can cause complications such as phlebitis, and the reported incidence of complications of a peripheral intravenous catheter (PIVC) phlebitis (53.4%) is relatively high in addition to other complications such as pain, extravasation, and leak obstruction. Prevention of PIVC phlebitis will lower medical costs and nurse workload and reduce patient stress, pain, and suffering [1].

To help improve the comfort of infants, children, and parents during the infusion procedure, including 1) Preparing the child and parents as best as possible before the medical procedure; 2) Invite parents/caregivers to attend; 3) Utilizing the treatment room for stress procedures; 4) Positioning the child in a comfortable way and 5) Maintaining a calm and positive atmosphere. Parents often carry their children when treated frequently in the hospital to make the child calmer and more comfortable [2]. During treatment, many children are carried to calm, make comfortable and interact with parents, moved indoors or outdoors, but often experience difficulties if the child is still installed infusion with a standard infusion..

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Family-centered care becomes important in the child's hospitalization because it can make children more adaptive undergoing the treatment process at the hospital [3,4]. Parents often carry their children when hospitalized to make them calmer and more comfortable [2]. Preliminary studies showed of the 30 children treated, 97% had infusions attached, and 53% of mothers or caregivers carry children for various reasons, either inside or outside the treatment room. Interviews with two nurses in the children's ward said it was common for children to be carried while being treated, but there were many complications with infusion during and after the child was carried. Given the potential benefits of maintaining a sick child as an intervention in preventing and managing pain and agitation, an innovative sling device is needed to facilitate the care of children installed in hospital infusions. Until now, there has been no carrying device that enables the care of children during the infusion, and this is the focus of research to make and pilot a study of an infusion carrying for children who receive treatment in the hospital.

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**2. Material and methods**

**2.1. Research design**

This research is pre-experimental research using a post-test-only design. Children and parents are given an infusion-carrying device to be used during the child's treatment in the hospital, and then an assessment of product innovation and parental satisfaction is carried out after using the infusion-carrying device.

**2.2. Population and sample**

All pediatric patients treated in the Children's Ward, Non-Intensive care unit, General Hospital of the Tugurejo Regional Hospital in Central Java Province, Indonesia, were used as a population in the research. Sixty children who are treated non-intensively become samples, and respondents in this study are parents of children with criteria

- Parents/caregivers of their children in the treatment room,
- Parents aged > 17 years,
- Parents can read and write,
- Have Children with infusion installed conditions,
- Have children aged six months to 3 years.

**2.3. Instruments and data analysis**

Respondents evaluated the assessment of innovative products with a questionnaire in 6 product dimensions, namely shape, product characteristics, performance (sling and infusion buffer), suitability, durability, and design consisting of 19 questions with answer choices ranging from strongly disagree to agree strongly. For the variable of parental satisfaction, the questionnaire consists of 6 questions with three dimensions, namely the suitability of expectations, interest in re-use, and willingness to recommend. All instruments have a good validity and reliability. Data processing using SPSS with descriptive and inferential analysis (Spearman's rho correlation test).

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**3. Results and discussion**

**3.1. Innovation products of infusion-carrying devices in the children's ward**

The infusion-carrying device innovation in child's care combines the concept of a baby carrier and an infusion sling based on an existing baby-wearing design. The advantage of this innovation is the addition of a special space for the placement of infusion poles which is expected to provide convenience and comfort for parents/ children who are treated in the pediatric ward. This design then enters the production table to be formed into ready-to-use infusion-carrying products. Then it was tested in non-intensive child care at the Tugurejo Regional General Hospital, Central Java Province in Semarang City with the following installation procedures:

- Install the infusion backpack, tighten the back rope and the waist strap with a clip, and tighten with the adjuster,
- Install the baby's arms with a buttocks rope to the back and waist rope,
- Insert both baby's feet between the hole of the arms,
- Install the rope Carry the baby's chest and stomach to the back rope and tighten as needed,
- Insert the infusion pole into the infusion pocket and tighten the rope, the pole hook rope is installed to keep the upright infusion position,
- Complete.

The selection of infusion slings with the form M position is an ergonomic position (10) the baby where the sling supports the baby from the knee to the neck so that head control is maintained. Both baby's legs should be supported in the knee and held M position is useful for being a strong grip on the back and keeping the knee joint from the arterial obstruction in the popliteal fossa, the safest for the m-position hip joint where the knee is higher than the baby's buttocks [5,6].

### 3.2. Mean of product assessment

The carrier device's performance is superior to other dimensions, followed by shape, durability, and design (Figure 1). The dimensions of suitability and product characteristics need special attention in product improvement.

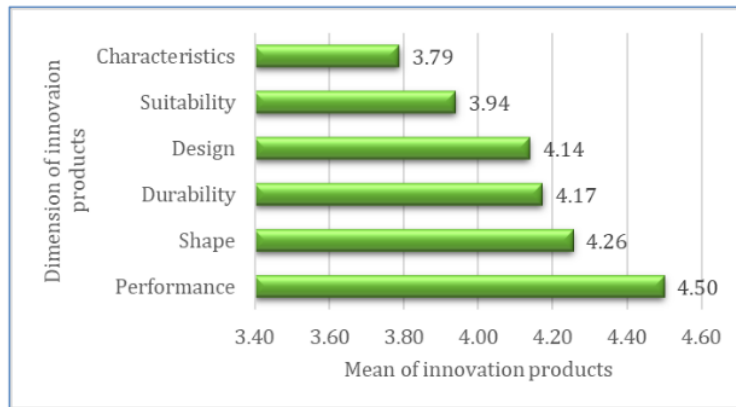


Figure 1 Summary of product evaluation for infusion carrier device (innovation products)

Ease of mobility, sling innovations in function and style, and ergonomic shapes are the main reasons for the popularity of baby carriers worldwide. In addition to providing ease of mobility and hands-free comfort and the ease of carrying a baby or child is another reason for choosing a baby carrier. The baby's positioning when held also determines the baby's safety. Children's health conditions in general, such as the release of airway disorders, and the presence of severe skin neglect, are other factors that need to be considered for the safety of the baby safety when carrying is also determined by the condition of the carrier, such as motor disorders or loss of consciousness due to the use of drugs [7].

### 3.3. Mean of parental satisfaction

Parents' willingness is quite great to recommend an infusion carrier device to other people, followed by the interest of parents to re-use the infusion carrier device. The dimension of suitability still needs to be re-explored for the refinement of the infusion carrier device so that it follows the expectations of parents (Figure 2).

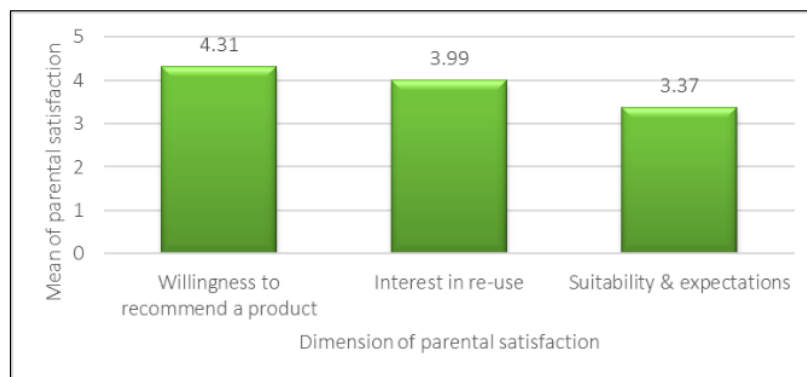


Figure 2 Summary of parental satisfaction after using infusion carrier device (innovation products)

The benefits of the function of the sling itself may cause an increase in satisfaction with the use of infusion slings. Carrying a baby will reduce the baby's crying. Carrying a baby reduces the baby's crying by 43% (1.23 v 2.16 hours/day) overall and reduces 51% of crying (0.63 v 1.28 hours) at night. Decreased baby crying is associated with increased satisfaction and frequency of eating. The innovation of infusion sling allows parents or drivers free of hands so that the caregivers are freer to interact with children, especially when providing food. This condition represents an opportunity that gives more positive value in line with the research results showing this infusion-carrying device's high performance. Carrying increases and maintains physical contact with the child, which positively affects the mother and baby. The benefits of physical contact and tactile communication as important for the physiology of child development[8].

### 3.4. The relationship between innovative infusion-carrying products with parental satisfaction

An infusion-carrying device can be an alternative to a baby/child-carrying device that is treated and attached to an IV. There is a significant relationship between the assessment of parents of users of innovation products with parental satisfaction with a p-value of < 0.001 and a correlation coefficient of 0.63 (Table 1).

**Table 1** The relationship of innovative infusion-carrying products with parental satisfaction

Variable	n	Correlation coefficient	p-value*
Product innovation → Parental satisfaction	60	0.630	<0.001

\*spearman's rho test

Using an infusion carrying can increase parental satisfaction in the children's ward at Tugurejo Regional Hospital. These results are relevant to several other research results that comfortable touches such as skin-to-skin, kangaroo treatments, hugs, and slings are already effective therapies for sick children [9,10] and is associated with improved autonomic stability, decreased pain, and decreased cortisol level [11,12]. Carrying a child comfortably also shows benefits for parents, including a decrease in stress symptoms and an increase in parental and child attachment [13].

This study has some limitations on habitual factors and the length of carrying during treatment that have not been evaluated even though these factors can reinforce recommendations for users. In addition, product assessments from other aspects, such as ergonomic aspects, both static and dynamic, are more objective. To overcome these limitations, it is recommended that subsequent researchers study the benefits of carrying devices from medical and non-medical aspects, especially from an economic point of view. In addition, the size of the carrying tool needs to be adjusted to the age and weight of the child, as well as the condition of the parents.

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## 4. Conclusion

An innovation of a carrying device that facilitates the need for a sling that can be used when the child is infused so as to maintain the benefits of carrying and the safety of giving infusions is maintained. The innovation of the infusion-carrying device was received positively and increased parental satisfaction when their child was an inpatient at Tugurejo Regional Hospital.

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## Compliance with ethical standards

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### Disclosure of conflict of interest

The authors reported no potential conflict of interest.

### Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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