Effect of Continuous Care Model on Mothers' Knowledge, Satisfaction and the Outcomes of their Children Undergoing Congenital Club-Foot Surgery

[1] Roquia Afify Abd El Fadel Afify,[2] Prof. Dr. Faten Shafik Mahmoud & [3] Prof. Dr. Amal Gharib Sabaq

[1] Assistant lecturer of pediatric Nursing, Faculty of Nursing, Benha University, [2] Professor of pediatric Nursing, Faculty of Nursing, Benha University, [3] Professor of pediatric Nursing, Faculty of Nursing, Benha University.

Abstract

Background: Congenital clubfoot has a significant impact on the physical performance and life of the affected child and leads to reduced quality of life (QoL) of the child. One of the ways to improve quality of life is to use the Continuous Care Model (CCM). **Aim:** To assess the effect of continuous care model on mothers' knowledge, satisfaction and the outcomes of their children undergoing congenital club foot surgery. **Method**: A quasi-experimental design was utilized to conduct this study. **Setting**: The study was conducted in the out patient and inpatient orthopedic pediatric departments at Benha university hospital and Benha Specialized Pediatric Hospital. **Subject**: A purposive sample of ٥٠ children accompanied their mothers. **Tools**: Four tools were used to collect data: Structured interview questionnaire sheet, Pediatric Mothers' Satisfaction Questionnaire, Child Health Questionnaire & Post Operative Complications Sheet. **Results:** There is significant statistical positive correlation between total mothers' knowledge, satisfaction& quality of life and between total mothers' satisfaction and children's quality of life at pre, post and follow-up implementation of continuous care model. Also negative correlation found between mothers' knowledge, satisfaction, children's quality of life and post operative complications after one month of implementation of continuous care model. **Conclusion:** The Continuous Care Model had a significant positive effect in improving mothers' knowledge, satisfaction and outcomes of their children undergoing clubfoot surgery. **Recommendations:** The continuous care model should be integrated as a nursing intervention for children undergoing clubfoot surgery.

Introduction

Clubfoot is the most common congenital musculoskeletal defect. The incidence is ١ or ٢ cases per ١٠٠٠ children born. It is approximately three times more frequent in males than in females. Clubfoot is presented unilaterally or bilaterally in ٥٠٪ of cases. (*López-Carrero et al., ٢٠٢٣*).

The symptoms are visible in both congenital and acquired clubfoot conditions. The child walks on the outside edge of the foot or, in extreme circumstances, on the back of the foot (to the greatest extent feasible). One or both feet may be affected. The clubfoot typically has four characteristics: bony malformations (mostly affecting the heel bone), joint misalignments or dislocations (the ankle is frequently affected), weakened or shortened muscles (for example, the calf muscles), and limitations in the capsule-ligament apparatus (when tendons or ligaments are short or damaged) (*Qureshi et al., ٢٠٢٢*).

Clubfoot or talipes equinovarus (TEV) can be either an isolated deformity (idiopathic), or associated with syndromes (*Akinyoola et al.,* ٢٠٢٣). Its etiology may be associated with myelodysplasia, arthrogryposis or multiple congenital deformities, but the most common presentation is in isolation, which is considered the idiopathic type due to their unknown cause. However, around ٢٠٪ of cases are associated with underlying diseases, classified as "teratological (*Oliveira et al.,* ٢٠٢٣).

Prenatal diagnosis is possible with an ultrasound routine check at around ٢٠ weeks, which can recognize the different forms of clubfoot. For isolated clubfoot, prenatal ultrasonography has an accuracy of ٨٦٪ and typically shows a higher Pirani score, indicating postnatal severity. Prenatal diagnosis can assist and psychologically ready parents for the condition and its management (*Dibello et al.,* ٢٠٢٢).

Following the failure of conservative methods, surgical repair can be used to achieve full correction of the clubfoot deformity. With numerous surgical treatments, it is difficult to attain plantigrade feet with a pain-free gait. As a result, selecting the appropriate initial surgical method is essential for achieving excellent long-term outcomes (*Abdou Mar'ei et al.,* ٢٠٢٢).

Management of clubfoot should be started just after birth and should be nonsurgical. The Ponseti process is based on casting, then serial manipulations, and then, if required, surgery. Management is given right away, after the child is born. On a weekly basis, the ligaments and tendons of the foot are stretched and manipulated, accompanied by the application of a soft-fiber glass cast that aids in the restoration of the ligament to its natural position. Surgical correction is typically postponed until the infant is between the ages of six and nine months. Surgery is used to correct the clubbed foot and

align it in its actual position (*Pandey et al.,* ٢٠٢١).

The Continuous Care Model (CCM) is one of the caring models designed to provide a plan for accepting and enhancing the patient's insight and function for continuous care and control of the disease and possible complications by training in the skills needed by patients after discharge. CCM focuses on the influential and balanced role of the nurse, the children and the children's family through a systematic approach and provides an effective, interactive and consistent communication between the client and the healthcare providers (*Borji et al.,* ٢٠١٦).

Nurses have an important role in the prevention of cast complications since they are the ones who identify the indicators of cast complications early on and take the necessary precautions (*Ibrahim & Abd Elkhair,* ٢٠٢٣).

Mothers are essential to the treatment of CTEV since the affected children frequently require physiotherapy, recurrent surgeries, and long-term usage of orthopaedic braces, all of which require a high level of adherence to treatment and follow-up. The awareness, knowledge, and habits of these mothers on the disease under consideration are closely linked to their compliance. The caretakers undergo extreme mental stress and seek advice from various sources, including medical professionals, family members, and traditional healers, in order to cure their patients (*Iqbal et al.,* ٢٠٢١).

Significance of the study:

Congenital conditions were the tenth most important cause of loss of health globally in ٢٠١٩. Congenital clubfoot is the seventh most prevalent congenital birth anomaly and the most common of the musculoskeletal system (*WHO,* ٢٠٢٠). Clubfoot, also known as congenital talipes equinovarus, is one of the common congenital conditions that causes mobility impairment in children. It is a

relatively common pediatric orthopaedic disorder and a frequent cause of disability in adult populations (*Tabard-Fougère et al., ٢٠٢٤).*

The global pooled prevalence of clubfoot was found to be ١.١٨ per ١٠٠٠ live births (٩٥٪ CI: ١.٠٠–١.٣٦), with a range of ٠.٩–١.٨ cases per ١٠٠٠ live births in different world regions. globally ١٧٦,٤٧٦ children will be born with clubfoot each year. The highest prevalence rates were observed in low- and middle-income countries, particularly in the South-East Asia Region (١.٨٠, ٩٥٪ CI: ١.٣٢–٢.٢٨) and the Africa Region (١.٣١, ٩٥٪ CI: ٠.٨٦–١.٧٧) (*Smythe et al., ٢٠٢٣).*

Furthermore, the overall number of children who admitted "from ٢٠٢٠ to ٢٠٢١" to the orthopedic pediatric surgery department in Benha University Hospital & Benha Specialized Pediatric Hospital hospitals were ٤١٠ and ٣٤.٩ percent (٧٥) of those children had congenital clubfoot surgery (*Statistical affairs department in Benha University Hospital & Benha Specialized Pediatric Hospital, ٢٠٢١).*

Congenital clubfoot has a negative impact on children's lives; if left untreated, it can lead to dependency on others for everyday activities, ambulation difficulties, and lifelong impairment. It has a significant financial impact not just on the family but also on the country (*Murtaza et al., ٢٠٢٠).* In Egypt, especially in Benha city, there is no study conducted to evaluate the effect of implementing continuous care model on mothers and children outcomes children undergoing congenital club foot surgery. So the researcher found urgent to conduct this study to improve quality of life, decrease the post operative complications and increase mothers' satisfaction.

Aim of the Study:
This study was aimed to assess the effect of continuous care model on mothers'

knowledge, satisfaction and the outcomes of their children undergoing congenital club foot surgery.

Research Hypotheses:
H١ - Mothers of children with congenital club foot who will receive the education based on continuous care model will exhibit higher knowledge mean scores than before.

H٢ - Mothers of children with congenital club foot who will receive the education based on continuous care model will exhibit higher satisfaction mean scores than before.

H٣ - Children with congenital club foot who will receive the education based on continuous care model will exhibit significant higher quality of life mean scores than before.

H٤ - Children with congenital club foot who will receive the education based on continuous care model will exhibit significant lower postoperative complications than before.

Subjects & Methods
Research design:
Quasi-experimental design (pre-posttest, one group) was followed to fulfill the aim of the study.

Setting:

The study was conducted in outpatient and inpatient orthopedic pediatric departments at Benha university hospital and Benha Specialized Pediatric Hospital in Benha city.

Sampling:
The sample size was calculated using this formula developed by (*Mason, ٢٠١٣).*

$$n= \frac{M}{[(S^2 *(M-1))/P(1-P)]+1}$$

Which:

n= Sample size **M**= Total population (٧٥)

S= This depends on level of confidence, for ٨٠٪ this is ١.٢٨٢ **P**= Error level ٥٪

Based on the above formula, the sample size required was ٥٠

A purposive sample of ٥٠ children accompanied their mothers was selected from the above mentioned setting after fulfilled the following inclusion criteria: Children from ١ to ٨ year with idiopathic clubfoot, recently diagnosed with unilateral or bilateral congenital clubfoot. Mothers of children are willing to participate in the study.

Tools of data collection:

The following tools were used in this study:

Tool (I): Structured interviewing questionnaire sheet:

This tool was designed by the researchers in an Arabic language after reviewing the recent and relevant literature. It was divided into four main parts:

Part ١: Characteristics of the studied mothers which included; age, level of education, occupation, consanguinity between parents, degree of consanguinity and source of information about congenital club foot (٦ items).

Part ٢: Characteristics of the studied children which included; the age, gender, ranking of child in family, educational level, affected foot and sibling history (٦ items).

Part ٣: Medical data of the studied children which included; symptoms appearing on child before diagnosis, diagnostic investigation, time of beginning treatment, type of treatment was used, the difficulties were faced during treatment of child and previous foot surgery and its name (٧ items).

Part ٤: Mother's knowledge assessment:

This tool was adapted from *Kyle & Carman, (٢٠٢١); Kliegman et al., (٢٠٢٠); Butterworth & Marcoux, (٢٠١٩); & Natrajan,*

(٢٠١٨); to assess mothers' knowledge regarding club foot. It involved (٢٦) multiple choice questions about definition, etiology (١question), signs & symptoms, forms, types, idiopathic clubfoot, secondary clubfoot, risk factors, investigation, complications, prevention, difficulties, methods of treatment, nonsurgical treatment, Ponsti method, French method, surgical treatment, indication for performing surgery, nursing care before, after and on discharge. Also, role of mother after surgery and, role of mother on discharge in cast care, hygiene care and range of movement.

Knowledge scoring system:

According to the answers collected from the mothers; a scoring system was applied to interpret mothers' knowledge assessment. The studied mothers' answers were checked and compared with the predesigned model answer that was given a score (١) for correct answer, while a score (٠) for wrong answer or don't know.

Tool (II): Pediatric Mothers' Satisfaction Questionnaire:

The researcher adopted this tool from *Ygge & Arnetz, (٢٠٠١)* to assess level of mothers' satisfaction regarding their children undergoing congenital club foot surgery. It was consisted of ٤٣ questions grouped under eight domains, as information on illness (٣ questions), information on routines (٤ questions), accessibility (٣ questions), medical treatment (٤ questions), care processes (٨ questions), staff attitudes (٨ questions), parent participation (٤ questions) and staff work environment (٩ questions).

Scoring system for mothers' satisfaction:

The mothers were asked to rate items on a ٤-point rating scale: ranged from (not at all=١, not specially=٢, somewhat= ٣ and to a great degree=٤).

Tool (III): Child Health Questionnaire Parent Form (CHQ PF):

The researcher adopted this tool from *Landgraf et al., (1996)*. The researcher used it to evaluate quality of life for children. It is a generic form of health related quality of life questionnaire (HRQOL). This questionnaire consisted of 50 statement categorized under 13 domains including global health (1 item), physical functioning (6 items), role/social–emotional/behavioral (3 items), role/social-physical (2 items), bodily pain (2 items), behavior (6 items), mental health (5 items), self-esteem (6 items), general health perceptions (6 items), parent impact emotion (3 items), parent impact time (3 items), families activities (6 items) and family cohesion (1 item).

Scoring system of Child Health Questionnaire:

The response options of each item vary from 4–6 levels. For concepts with multiple items, the responses to the items are summed up and transformed to a scale that ranges from 0 (lowest possible score indicating the worst health) to 100 (highest possible score indicating the best health).

Tool (IV): Post Operative Complications Sheet:

The researcher designed this tool after reviewing related literature as *Cady et al., (2022)*; *Hegazy et al., (2019);& Chotigavanichaya et al., (2017).* It was used to assess the post operative complications regarding children undergoing congenital club foot surgery on discharge and follow up, it was included seven elements as; bleeding, infection, plaster sores and dermatitis, relapsed foot, cast loosening, vascular necrosis of foot bones, hematoma and wound dehiscence.

Scoring system of Post Operative Complications Sheet:

The scoring system of post operative complications sheet was ranged from (0- 1) grade which classified as the following: grade (0) indicated absence of complication and grade (1) indicated presence of complication.

Content validity:

Tools of data collection were investigated for their content validity by panel of three experts (two professor and one assistant professor in pediatric nursing specialty from the faculty of nursing, Benha University) to test content validity of the tools and to judge its clarity, relevance, comprehensiveness, understanding and applicability. The opinion was elicited regarding the layout, format and sequence of the questions and all of their remarks were taken into consideration and the tools were regarded as a valid from the experts' point of view.

Reliability:

A statistician used Cronbach's alpha coefficient test in SPSS program, version 24 to examine the produced tools for dependability. The results were as the following: Internal consistency reliability Cronbach's alpha for Mother's knowledge regarding congenital club foot is good reliable emerged as (0.827), Pediatric mothers' Satisfaction Questionnaire (0.858), Child Health Questionnaire Parent Form (0.901) & Post Operative complications sheet (0.940).

Ethical Consideration:

An approval was obtained from the Scientific Research Ethical Committee at the faculty of Nursing Benha University. After explaining the study's aim, advantages, risks, and procedure, each child/participant gave his verbal oral agreement to participate. The data was kept private and anonymous, and it was only used for research purposes. Participants were informed that participation in the study was entirely optional and that they had the right to withdraw at any time without incurring any consequences.

Administrative approval:

Official letters was taken from the Dean of Faculty of Nursing, Benha university contains the title, objectives, tools and the study technique was directed to the directors of the previously mentioned settings to obtain the official agreement to conduct study.

Pilot study:

A pilot study was conducted on five children accompanied their mothers from the entire sample size who were randomly selected from the same setting to examine the clarity, feasibility, and applicability of the study tools. In the light of pilot study analysis, no modification was done, and mothers were included to total sample of the study.

Pilot Study took approximately one month from the beginning to the end of June.

Field work:

Data collection period:

The data was collected over a ١١-month period, beginning ١st of July ٢٠٢٢ and ending May ٢٠٢٣. The researcher began by introducing herself to the participants and providing a quick overview of the study's purpose and nature. The researcher came to the study settings three days a week (Saturday in Benha University Hospital because this day is specific for performing and follow up pediatric foot and ankle surgery & Sunday and Wednesday in Benha Specialized Pediatric Hospital) from ١٢:٠٠ PM to ٢:٠٠ PM according to the beginning time of orthopedic pediatric outpatient clinic. Initial screening was carried out for all children having inclusion criteria. An oral approval obtained from each child/caregiver after explaining the aim of the study

● **Study Framework:**

The Study's Framework was divided into four stages as the following:

Familiarization stage:

This period took ٣ months (from the beginning of July ٢٠٢٢ to the end of September ٢٠٢٢).

This stage was the first step is to establish the accurate recognition of the problem, identify needs. Each child and his mother were interviewed individually. Number of mothers and their children taken every week was ranged from ٣-٥ mothers. At the beginning of interview; the researcher welcomed mothers and their children, explained the purpose, duration and orienting them about continuous care model, stages, create motivation and discuss the importance of continuing care contact between the researcher and the participant of the study, explain the ways of communication and identify the required phone calls schedules until the end of the intervention. and take their oral approval to participate in the study prior to baseline data collection.

The researcher gave the studied mothers Structured Interviewing Questionnaire **(Tool I)** in order to fill to assess mothers' & children personal data & knowledge regarding club foot. It took nearly (١٠-١٥ minutes).

Then, the researcher distributed Pediatric Mothers' Satisfaction Questionnaire **(Tool II)** (Pretest) to assess level of mothers' satisfaction regarding their children undergoing congenital club foot surgery. The average time required for completion of the questionnaire was nearly (١٠-١٥ minutes).

Then, the researcher distributed Child Health Questionnaire Parent Form **(Tool III)** (Pretest) to evaluate quality of life for children undergoing congenital club foot surgery. The average time required for completion of the questionnaire was around (١٠-١٥ minutes).

This stage consisted of the program development and instructional design (teaching methods and media) and took ٤ months from the beginning of October to the end of January ٢٠٢٣.

It was performed to engage the mothers in the continuous care process. Based on baseline data obtained from the familiarization

stage and relevant literature reviews, the educational program was developed by the researcher as indicated by mothers' level of understanding in simple Arabic language. Different methods of teaching were used as modified lecture, demonstration, re-demonstration and group discussion. Suitable teaching media were included a hand out as well as audio-visual aids, role play, manikin and real equipment to help proper understanding of the content by mothers.

Program development: It took one months from the beginning of October to the end of October ٢٠٢٢.

Theoretical sessions of the program:

a) First Session: the researcher introduce herself to the participants and introduce the content and its objectives at the beginning of this session, the researcher stated the objectives of this session. It included; brief explanation about anatomy of foot and ankle, definition of congenital clubfoot, causes, classification, forms, signs & symptoms, risk factors, investigation, complications, preventive measures and brief on methods of treatment. It took ٤٥-٦٠ minutes.

b) Second Session: included information about course of treatment in details including nonsurgical as: (ponsti method) & surgical methods of treatment and the indication of performing surgery when child not response to ponsti method treatment, nursing care before surgery as inform the doctor about the child's history, symptoms, examination of the child by the orthopedic surgeon to find out the degree of clubfoot, preparation for surgery as fasting for ٦-٨ h. Nursing care after surgery as follow up of vital signs, performing neurovascular assessment every hour for ٢٤ hours, administer medications as planned, such as prophylactic antibiotics and adequate dose of pain reliever. It took ٤٥-٦٠ minutes

c) Third Session: included information about nursing care of children with clubfoot surgery on discharge as the importance of follow-up care, indication for calling pediatric orthopedic surgeon in case of intense edema, fever, change of color of foot, child unable to move their toes. The researcher discussed complications after surgery and how to deal with it. Also illustrated healthy dietary regimen after surgery then taught mothers some exercises to perform for child after surgery. It took ٤٥-٦٠ minutes

d) Forth Session: included information about role of mother after surgery and on discharge included an explanation about the importance of commitment to a regular follow-up schedule and following the physician's advice. Explain nursing guidelines for the practice of cast care including; (position, handling, skin care), hygiene care (bathing and diaper care), and range of movement. It took ٦٠ minutes.

Implementation phase

This phase took ٣ months from the beginning of November ٢٠٢٢ to the end of January ٢٠٢٣.

The implementation phase was achieved through sessions, each session started by a summary of the previous session and objective of the new one. Taking into consideration the use of Arabic language that suits the studied mothers and their children' educational level. Motivation and reinforcement during sessions were used to enhance motivation for the sharing in the study. The educational sessions were given to each mother accompanied her child separately in the orthopedic/ general surgery inpatient department within ٢ days before discharge for each mother and her child. The number of mothers taken ranged from ١-٢ mother a day. The total number of theoretical sessions for the studied mother (٤) session, each session kept going from ٤٥-٦٠ minutes, The sessions were started at ١٢:٠٠ PM to ٢:٠٠ PM.

three days a week (Saturday, Sunday and Wednesday). These sessions were repeated to each mother.

Control stage:

This stage took one month from the beginning of February ٢٠٢٣ to the end of February ٢٠٢٣.

During this stage, mutual relationships between researchers and the studied mothers are maintained through weekly phone calls for each mother (٨ calls) throughout one months, according to the mother's preferred time and readiness for making phone calls (morning or afternoon). Each mother's phone call were varied depending on a mother's needs. Issues such as child's situation after the surgery, diet, pain alleviation, bath limitations, and any arising problems were the subject of telephone calls was identified, addressed and resolved.

Evaluation stage:

This stage took ٣ months from the beginning of march to the ending of May ٢٠٢٣. After conducting educational program mothers' and their children knowledge, satisfaction, quality of life was evaluated using **tools (I), (II) & (III)** (post and after three months as follow-up). Additionally the child postoperative complications was assessed using **Tool (IV)** on discharge, after one month and after three months as follow-up by evaluate the effect of implemented continuous care model.

Statistical analysis:

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version ٢٤. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X^2). Different between the group during the two visits were assessed by paired t test and different between the group during the three visits were assessed by repeated measures ANOVA. In addition, R- test were used to identify the correlation between the study variables.

Degrees of significance of results were considered as follows:

- P-value > ٠.٠٥ Not significant (NS)

- P-value < ٠.٠٥ Significant (S)

- P-value ≤ ٠.٠٠١ Highly Significant (HS).

Results:

Table (١): Shows that, less than half of the studied mothers (٤٦.٠٪) are in the age group ٢٥ -< ٣٠ years with mean age is ٢٧.٥٢ ± ٥.٦٧ years, half of them (٥٠.٠٪) have secondary education. As regards to occupation, more than two thirds of them (٧٠.٠٪) are working. Also, more than half of the studied mothers (٥٢.٠٪) have positive consanguinity and more than half of them (٦١.٥٪) who have positive consanguinity are first degree.

Figure (١): Displays that, more than half of the studied mothers (٦٤.٠٪) have information about clubfoot from doctor, while (٤٪) of them have information from printed media.

Table (٢): Illustrates that, more than half of the studied children (٥٦.٠٪) are in the age group ١ -< ٣ years with mean age is ٣.١٨ ± ١.٠٧ years, the majority of them (٨٦.٠٪) are male. Also, more than half of them (٦٠.٠٪ & ٦٠.٠٪ respectively) have first ranking between their siblings and KG education. Moreover, more than two-thirds of them (٦٨.٠٪) have bilateral clubfoot and more than three quarter of them (٧٨.٠٪) don't have medical history of their siblings regarding clubfoot.

Table (٣): Demonstrates that, two-thirds of the studied children (٦٦.٠٪) have torsion of the upper part of the foot downward and inward. Moreover, all of them (١٠٠.٠٪) are examined

by the doctor. The majority of them (٨٨.٠٪) are started treatment for less than a year and treated by Ponseti method by stretching and splinting the affected part respectively. Moreover, more than one quarter of them (٢٨.٠٪) have history of foot surgery and all of them (١٠٠.٠٪) undergoing tenotomy surgery.

Table (٤): Illustrates that, the total mean score of the studied mother's knowledge regarding club foot pre implementation phase of continuous care model is (٦.٢٠٠ ± ٣.٤٥) which increased to (١٧.٣٠± ٢.١٨) post implementation phase of continuous care model and (١٥.٧٦± ٢.٣٢) ٣ months follow up phase implementation of continuous care model. Also, there is a highly statistical significant difference in the total mean score of the studied mothers' knowledge regarding care of clubfoot between pre, post and follow-up implementation of continuous care model (p=٠.٠٠٠).

Table (٥): Illustrates that, the total mean score of the studied mother's satisfaction regarding club foot surgery pre implementation phase of continuous care model is (٦٩.٤٢ ± ١٠.٠١) which increased to (١٦٣.٥٠ ± ٩.٢٢) post implementation phase of continuous care model and (١٥٥.٨٨ ± ١٢.٦٣) ٣ months follow up implementation phase of continuous care model. Also, there is a highly statistical significant difference (p=٠.٠٠٠) in the total mean score of the studied mother's satisfaction regarding their children undergoing club foot surgery between pre, post and follow-up implementation of continuous care model.

Table (٦): Illustrates that, the total mean score of the studied children's quality of life regarding club foot surgery pre implementation phase of continuous care model is (٩١.٣٦ ± ١٣.٣٦) which increased to (٢٠٩.٠٦ ± ١٠.٢) post implementation phase of continuous care

model and (٢٠٤.٨ ± ١١.٨٦) ٣ months follow up implementation phase of continuous care model. Also, there is a highly statistical significant difference (p=٠.٠٠٠) in the total mean score of the children's quality of life regarding club foot surgery between pre, post and follow-up implementation of continuous care model.

Table (٧): Shows that, one fifth of the studied children (٢٠.٠٪) have infection and hematoma on discharge. Meanwhile, the minority (١٢.٠٪ and ٨.٠٪) have infection and hematoma after one month and all of them (١٠٠.٠٪) don't have infection and hematoma after three months of implementation of continuous care model. Also, there is a statistical significant difference in post-operative complications on discharge and follow up after implementation of continuous care model (P < ٠.٠٠١)

Table (٨): Clarifies that, there is significant statistical positive correlation between total knowledge level, total satisfaction score of the studied mothers at pre(r=٠.٣٥٨, p= ٠.٠٠٧**), post (r=٠.٤٥٩, p =٠.٠٠١**) &follow-up implementation of continuous care model (r=٠.٤٠٠ and p =٠.٠٠٤**). While, there is significant statistical positive correlation between total knowledge levels total children's quality of life score of the studied mothers at pre (r=٠.٧٤٣, p = ٠.٠٠٠**) post (r=٠.٣٥٩, p=٠.٠٠٧**) & follow-up implementation of continuous care model (r=٠.٤٢١, p =٠.٠٠٠**). Additionally, there is significant statistical positive correlation between total children's quality of life score& total satisfaction score of them at pre (r=٠.٨٢٨, p= ٠.٠٠٠**) post (r=٠.٥٩٥, p=٠.٠٠٠**) & follow-up implementation of continuous care model (r=٠.٥٧٥, p=٠.٠٠٠**).

Table (٩): Shows that, there is significant statistical negative correlation between total mothers' knowledge score and

bleeding, infection & hematoma after one month of implementation of CCM at (r=٠.٤٤٧, p= ٠.٠٠**) & (r=٠.٥٢٩, p= ٠.٠٠**) (r=٠.٣٠٢, p= ٠.٠٣٣*) respectively. While, there is no significant statistical correlation between total mothers' knowledge score and plaster sores& dermatitis, cast loosening and relapsed foot after three month of implementation of CCM. Also, this table clarifies that, there is significant statistical negative correlation between total mothers' satisfaction score and hematoma after one month of implementation of CCM at (r=٠.٣٣٦, p= ٠.٠١٧*). While, there is no significant statistical correlation between total mothers' satisfaction score and plaster sores& dermatitis, cast loosening and relapsed foot after three month of implementation of CCM. Additionally, this table shows that there is significant statistical negative correlation between total children's quality of life score and infection after one month of implementation of CCM at (r=٠.٦٨٤, p= ٠.٠٠**). likewise, there is no significant statistical correlation between total children's quality of life score and plaster sores& dermatitis, cast loosening and relapsed foot after three months of implementation of CCM.

Table (١): Distribution of the studied mothers regarding their characteristics (n=٥٠).

Characteristics of the studied mothers	No.	%
Age (years)		
٢٠ -< ٢٥	١٣	٢٦.٠
٢٥ -< ٣٠	٢٣	٤٦.٠
٣٠ -< ٣٥	٦	١٢.٠
≥ ٣٥	٨	١٦.٠
Mean ± SD (٢٧.٥٢± ٥.٦٧)		
Educational level		
Illiterate	٣	٦.٠
Read and write	٤	٨.٠
Primary education	٧	١٤.٠
Preparatory education	٨	١٦.٠
Secondary education	٢٥	٥٠.٠
High education	٣	٦.٠
Occupation		
Working	٣٥	٧٠.٠
Don't work	١٥	٣٠.٠
Consanguinity		
Yes	٢٦	٥٢.٠
No	٢٤	٤٨.٠
If yes, what is the degree of consanguinity? (n=٢٦)		
First degree	١٦	٦١.٥
Second degree	٧	٢٦.٩

	No.	%
Third degree	٣	١١.٦

Table (٢): Distribution of the studied children according to their characteristics (n=٥٠).

Characteristics of the studied children	No.	%
Age (years)		
١ -< ٣	٢٨	٥٦.٠
٣ -< ٥	١٣	٢٦.٠
٥ _ ٨	٩	١٨.٠
Mean ± SD (٣.١٨ ± ١.٠٧)		
Gender		
Male	٤٣	٨٦.٠
Female	٧	١٤.٠
Child ranking		
First	٣٠	٦٠.٠
Second	١٣	٢٦.٠
Third and more	٧	١٤.٠
Educational level		
KG education	٣٠	٦٠.٠
Preschool	١٧	٣٤.٠
Primary school	٣	٦.٠
Affected foot		
Right foot	٧	١٤.٠
Left foot	٩	١٨.٠
Bilateral foot	٣٤	٦٨.٠
Medical history of the siblings		
Yes	١١	٢٢.٠
No	٣٩	٧٨.٠

Medical data of the studied children	No.	%
The symptoms that appeared on the child before the diagnosis		
Torsion of the upper part of the foot downward and inward	٣٣	٦٦.٠
The heel rotates inward.	١١	٢٢.٠
The affected leg or foot is slightly shorter than the other	٠	٠.٠
The calf muscles of the affected leg are underdeveloped	٦	١٢.٠
No pain	٠	٠.٠
*The investigations that conducted for the child		
MRI	٣	٦.٠
Examination of the child by the doctor	٥٠	١٠٠.٠
X ray	٢٢	٤٤.٠
Ultrasound	١٤	٢٨.٠
Nerve examination	٠	٠.٠
Time of starting treatment for child		
< ١ year	٤٤	٨٨.٠
١-٥ years	٦	١٢.٠
> ٥ years	٠	٠.٠
Method of treatment was used for the child before the surgery		
Ponseti method by stretching and splinting the affected part	٤٤	٨٨.٠
French method by massage	٦	١٢.٠
History of foot surgery		
Yes	١٤	٢٨.٠
No	٣٦	٧٢.٠
If yes, what was the surgery? (n=١٤)		
Tenotomy	١٤	١٠٠.٠

Table (٣): Distribution of the studied children regarding their medical data (n=٥٠).

Table (٤): Total mean score of the studied mother's knowledge regarding club foot at pre, post and follow-up implementation of continuous care model (n=٥٠).

Items	Pre implementation of Continuous care model		Post implementation of Continuous care model		Follow-up implementation of Continuous care model		t test Test of Sig. (p١)	t test Test of Sig. (p٢)	t test Test of Sig. (p٣)	t test Test of Sig. (p٤)
	Mean	±SD	Mean	±SD	Mean	±SD				
Total knowledge	٧.٩٤٠	± ٤.٧٧	٢٠.٧٢	± ٢.٤٨	١٩.٠٠	± ٢.٨٨	t=-١٦.٧٩٣ P=٠.٠٠٠**	t=-١٤.٠١٩ P=٠.٠٠٠**	t=٢.٧٦٢ p=٠.١٠٨ NS	F=١٩٣.٥٢ P=٠.٠٠٠**

t= Paired test. F= ANOVA Test. P= p-value   NS No significant at p >٠.٠٥.   * Significant at p ‹ ٠.٠٥.   **Highly significant at p ‹ ٠.٠٠١.
P١: p value for comparing between **pre and post** intervention.   P٢:p value for comparing between the in **pre and Follow-up** intervention.
P٢: p value for comparing between **post and Follow-up** intervention.   P٤: p value for comparing between the **three sessions**.

Table (٥): Total mean score of the studied mother's satisfaction regarding their children undergoing club foot surgery at pre, post and follow-up implementation of continuous care model (n=٥٠).

Items	Pre implementation of Continuous care model		Post implementation of Continuous care model		Follow-up implementation of Continuous care model		t test Test of Sig. (p١)	t test Test of Sig. (p٢)	t test Test of Sig. (p٣)	t test Test of Sig. (p٤)
	Mean	±SD	Mean	±SD	Mean	±SD				
Total satisfaction	٦٩.٤٢	± ١٠.٠١	١٦٣.٥٠	± ٩.٢٢	١٥٥.٨٨	± ١٢.٦٣	t=٤٤.٥٥ P=٠.٠٠٠**	t=٣١.٥٢ P=٠.٠٠٠**	t=٢.٣٣٨ p=٠.٠٥٧ NS	F=١١٤٣.٨ P=٠.٠٠٠**

t= Paired test. F= ANOVA Test. P= p-value   NS No significant at p >٠.٠٥.   * Significant at p ‹ ٠.٠٥.   **Highly significant at p ‹ ٠.٠٠١.
P١: p value for comparing between **pre and post** intervention.   P٢:p value for comparing between the in **pre and Follow-up** intervention.
P٢: p value for comparing between **post and Follow-up** intervention.   P٤: p value for comparing between the **three sessions**.

Table (٦): Total mean score of the studied children's quality of life undergoing club foot surgery at pre, post and follow-up implementation of continuous care model (n=٥٠).

Items	Pre implementation of Continuous care model		Post implementation of Continuous care model		Follow-up implementation of Continuous care model		t test Test of Sig. (p١)	t test Test of Sig. (p٢)	t test Test of Sig. (p٣)	t test Test of Sig. (p٤)
	Mean	±SD	Mean	±SD	Mean	±SD				
Total quality of life score	٩١.٣٦	± ١٣.٣٦	٢٠٩.٠٦	± ١٠.٢	٢٠٤.٨	± ١١.٨٦	t=٤٩.٩٩ P=٠.٠٠٠**	t=٤٢.٦٣ P=٠.٠٠٠**	t=١.٦٩٩ p=٠.٠٧٤ NS	F=١٥٧١.٤ P=٠.٠٠٠**

t= Paired test. F= ANOVA Test. P= p-value   NS No significant at p >٠.٠٥.   * Significant at p ‹ ٠.٠٥.   **Highly significant at p ‹ ٠.٠٠١.

Table (٧): Distribution of the studied children regarding post-operative complications on discharge and follow up phases after implementation of continuous care model (n=٥٠).

Items	On discharge				After one month				After three months				X² (p١)	X² (p٢)	X² (p٣)	X² (p٤)
	Yes		No		Yes		No		Yes		No					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Bleeding	٧	١٤.٠	٤٣	٨٦.٠	٤	٨.٠	٤٦	٩٢.٠	٠	٠.٠	٥٠	١٠٠.٠	X²=٠.٥٢٥ P=٠.٢٦٢ NS	X²=١٠.٩٦ P=٠.٠٠٥**	X²=٤.١٦٧ p=٠.٠٤١*	X²=٧.٢٦٠ P=٠.٠٢٧*
Infection	١٠	٢٠.٠	٤٠	٨٠.٠	٦	١٢.٠	٤٤	٨٨.٠	٠	٠.٠	٥٠	١٠٠.٠	X²=٥.١٩٠ P=٠.٠٤٥*	X²=١٢.٣١ P=٠.٠٠٠**	X²=٦.٣٨٣ p=٠.٠١٢*	X²=٤.٤٦٠ P=٠.٠٤٨*
Plaster sores and dermatitis	٠	٠.٠	٥٠	١٠٠.٠	٣	٦.٠	٤٧	٩٤.٠	٦	١٢.٠	٤٤	٨٨.٠	X²=٣.٠٩٣ P=٠.٠٧٩ NS	X²=٦.٢٠١ P=٠.٠٣٥*	X²=١.٠٩٩ p=٠.٢٩٥ NS	X²=٦.٣٨٣ P=٠.٠٤١*
Cast loosening	٠	٠.٠	٥٠	١٠٠.٠	٧	١٤.٠	٤٣	٨٦.٠	١١	٢٢.٠	٣٩	٧٨.٠	X²=٧.٥٢٧ P=٠.٠٠٦**	X²=١١.٢٠ P=٠.٠٠٠**	X²=١.٠٨٤ p=٠.٢٩٨ NS	X²=١١.٧٤٢ P=٠.٠٠٣*
Hematoma	١٠	٢٠.٠	٤٠	٨٠.٠	٤	٨.٠	٤٦	٩٢.٠	٠	٠.٠	٥٠	١٠٠.٠	X²=٥.٩٩٠ P=٠.٠٣٧*	X²=١٢.٣١ P=٠.٠٠٠**	X²=٤.١٦٧ p=٠.٠٤١*	X²=٧.٢٧٦ P=٠.٠٢٦*
Wound dehiscence	٧	١٤.٠	٤٣	٨٦.٠	٣	٦.٠	٤٧	٩٤.٠	٠	٠.٠	٥٠	١٠٠.٠	X²=١.٧٧٨ P=٠.١٨٢ NS	X²=١٠.٩٦ P=٠.٠٠٥**	X²=٣.٠٩٣ p=٠.٠٧٩ NS	X²=٧.٩٢٩ P=٠.٠١٩*
Relapsed foot	٠	٠.٠	٥٠	١٠٠.٠	٠	٠.٠	٥٠	١٠٠.٠	٥	١٠.٠	٤٥	٩٠.٠	X²=٠.٠٠٠ P=١.٠٠٠ NS	X²=٦.٠٠٠ P=٠.٠٣٩*	X²=٧.٥٠١ P=٠.٠٠١**	X²=٦.٠٠١ P=٠.٠٢٢*

X²: Chi-square test.   P= p-value   NS No significant at p > ٠.٠٥.   * Significant at p < ٠.٠٥.   **Highly significant at p < ٠.٠٠١.

P١: p value for comparing between **on discharge and after one month**.

P٢: p value for comparing between the in **on discharge and after three months**.

P٣: p value for comparing between the in **after one month and after three months**.

P٤: p value for comparing between the **three times**.

Table (٨): Correlation between total mothers' knowledge score, total satisfaction score and total children's quality of life score at pre, post and follow-up implementation of continuous care model (n=٥٠).

	Total mothers' knowledge score						Total children's quality of life score					
	Pre implementation of CCM		Post implementation of CCM		Follow-up implementation of CCM		Pre implementation of CCM		Post implementation of CCM		Follow-up implementation of CCM	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Total mothers' satisfaction score	٠.٣٥٨	٠.٠٠٧**	٠.٤٥٩	٠.٠٠١**	٠.٤٠٠	٠.٠٠٤**	٠.٨٢٨	٠.٠٠٠**	٠.٥٩٥	٠.٠٠٠**	٠.٥٧٥	٠.٠٠٠**
Total children's quality of life score	٠.٧٤٣	٠.٠٠٠**	٠.٣٥٩	٠.٠٠٧**	٠.٤٢١	٠.٠٠٠**						

r= correlation coefficient test.   P= p-value   **Correlation is significant at the ٠.٠٥ level (٢-tailed).

Table (٩): Correlation between post-operative complications total mothers' knowledge score, total satisfaction score & total children's quality of life score and after one month and after three months of implementation of continuous care model(n=٥٠).

Variables	Total mothers' knowledge score				Total mothers' satisfaction score				Total children's quality of life score			
	After one month		After three months		After one month		After three months		After one month		After three months	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Bleeding	-٠.٤٤٧-	٠.٠٠٠**	٠	٠	-٠.١٠٥-	٠.٤٦٥NS	٠	٠	٠.٠٧٥	٠.٦٠٧ NS	٠	٠
Infection	-٠.٥٢٩-	٠.٠٠٠**	٠	٠	٠.٠٢٠	٠.٨٩٢NS	٠	٠	-٠.٦٨٤-	٠.٠٠٠**	٠	٠
Plaster sores and dermatitis	-٠.٠٧٤-	٠.٦٠٨ NS	-٠.٠٦٠-	٠.٦٧٨NS	٠.١٨٣	٠.٢٠٤NS	-٠.١٤٣-	٠.٣٢٠ NS	٠.٠٦٤	٠.٦٦٠ NS	-٠.٢٤٢-	٠.١٠١NS
Cast loosening	٠.١٢٨	٠.٣٧٥NS	-٠.٠٨٩-	٠.٥٣٩NS	٠.١٥٩	٠.٢١٥	٠.١٨٥	٠.١٩٩NS	٠.١٠٢	٠.٤٨١ NS	٠.٠٩٠	٠.٤٨٥ NS

Hematoma	-٠.٣٠٢-	٠.٠٣٣*	٠	٠	-٠.٣٣٦-	٠.٠١٧*	٠	٠	٠.٠٧٥	٠.٦٠٧ NS	٠	٠
Wound dehiscence	-٠.١٣٤-	٠.٣٥٤ NS	٠	٠	٠.٠٦٣	٠.٦٦٤ NS	٠	٠	٠.٠٦٤	٠.٦٦٠ NS	٠	٠
Relapsed foot	٠	٠	-٠.١٨٨-	٠.١٢٥ NS	٠	٠	-٠.١٧٢-	٠.١٣٠ NS	٠	٠	-٠.٢٣١-	٠.١١١ NS

r= correlation coefficient test. P= p-value Correlation is significant at the ٠.٠٥ level (٢-tailed)

Figure (١): Distribution of the studied mothers regarding their source of information about clubfoot (n=٥٠).
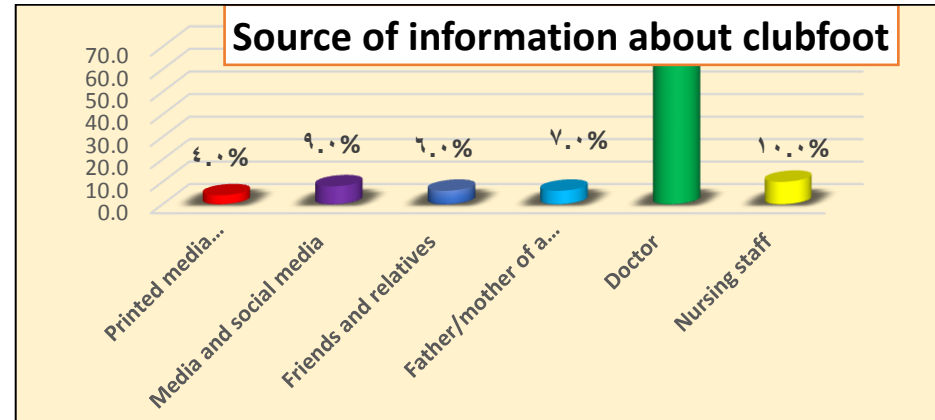
Discussion

Clubfoot is a complex musculoskeletal deformity of the foot requiring consistent efforts of the surgeon as well as parents for its correction (**Saini et al., ٢٠٢٣).** Club foot can lead to lifelong disability. The child affected may not be able to wear shoes, may experience pain when walking, may have low self-esteem, may not be able to perform basic tasks such as carrying water, collecting food and going to school. These factors may affect the health of an individual (**Muinde, ٢٠٢١).** The improvement of a child's health related quality of life is the ultimate goal of treatment for children with orthopedic issues. Options for treatment depend on the child's age (**Ibrahim & Abd Elkhair, ٢٠٢٣).**

One of the ways that nurses could continue their care and education even after the discharge of the child from hospital is to use the continuous care model (CCM). Using this model, nurses would be able to care for both the child and their family (**Panahi et al., ٢٠٢٢).**

Regarding characteristics of studied mothers the finding of present study showed that, less than half of the studied mothers were in the age group ٢٥ -< ٣٠ years with mean age (٢٧.٥٢ ± ٥.٦٧) years old, half of the studied mothers had secondary education & more than two thirds of them were working. Maternal characteristics found to be significantly associated with increased risk of clubfoot were young maternal age at conception and low maternal education (**Dim et al., ٢٠٢٢).**

Consanguinity (when parents are related by blood) increases the prevalence of rare genetic congenital anomalies and nearly doubles the risk for neonatal and childhood death, intellectual disability and other anomalies. Thus, clubfoot is a heterogeneous disorder with polygenetic inheritance (**Dim et al., ٢٠٢٢).** This matches with the present study which showed that, more than half of the studied mothers have positive consanguinity with the father. This result matches with **Abdallah & Nassar, (٢٠٢٢)** who conduct study about "Outcome of prenatal diagnosis of clubfoot" and found that more than three quarters of them have positive consanguinity.

Regarding source of information about clubfoot the present study revealed that, less than two thirds of the studied mothers obtained information about clubfoot from doctor. This reflects that nurse not participate in increasing the awareness of mothers about the condition, and instead of having role, the doctor became the major source of information. This finding agrees with **Butt et al., (٢٠٢٣)** who conduct study about "Outcomes of the Ponseti Technique in Different Types of Clubfoot—A Single Center Retrospective Analysis" and found that less than half of the studied mothers had information about clubfoot from doctor.

Regarding characteristics of the studied children the present study revealed that, more than half of the studied children are in the age group ١ -< ٣ years with mean age (٣.١٨ ± ١.٠٧) years old. This finding agree with **Ugorji, et al., (٢٠٢٠)** who conduct study in South- East Nigeria about "Epidemiology and Pattern of Clubfoot in Enugu" and found that more than half of the children were are in the age group ١ -< ٣ years.

Male gender are around twice as likely as females to develop idiopathic clubfoot (**Gurnett et al., ٢٠٢٣).** This agrees with the present study which indicated that, the

majority of the studied children were male. This matches with **Udemezue et al., (٢٠٢٣)** who also suggested that females require a greater number of predisposing factors than males to produce a clubfoot deformity. Gender differences also play a role in increasing incidence rate in male than female. for this male preponderance may be due to social bias and increased attention towards males, as also suggested by **Singh and Varshney, (٢٠٠٨).**

Congenital clubfoot was more common in first born children than other ranking (**Ruzzini et al., ٢٠٢٣).** This consistent with the present study which indicated that, less than two thirds of the studied children were first ranking. This finding agree with **Saini et al., (٢٠٢٣)** who conduct study about "a prospective study on functional outcomes of serial cast correction in congenital talipes equinovarus (CTEV) by ponseti method" and found that more than two thirds of the studied children were of first born.

A bilateral presentation of clubfoot occurs in ٥٠٪ of cases, while in the case of unilateral disease, the right foot is the most affected (**Ruzzini et al., ٢٠٢٣).** This agrees with the present study that revealed that, more than two-thirds of the studied children had bilateral clubfoot. This finding congruent with **Rudraprasad et al., (٢٠٢٠)** who conduct study in India about " analysis of clubfoot clinic at a pediatric tertiary care government hospital in Karnataka" and found that more than half of the studied children had bilateral clubfoot.

Concerning medical history of the siblings the present study showed that, more than three quarter of the studied children had no siblings history. This may be due to less than two thirds of studied children were first ranking and there is a ١٠٪ chance of a subsequent child being affected if the parents already have a child with a clubfoot (**Dim et al., ٢٠٢٢).** This finding matches with **Almogbil et al., (٢٠٢١)** who conduct study about "The level of public awareness about clubfoot in the al-qassim region and importance of early childhood intervention: a cross-sectional study" and found that majority of the studied children had no medical history of the siblings.

Concerning the investigations that done for the child the present study showed that, all of the studied children were examined by the doctor after birth. This finding agree with **Kardm et al., (٢٠٢٢)** who conduct study in Saudi Arabia about "what does Aseer region community know about club foot, its related risk factors, and management options?" and reported that less than half of them were examined by the doctor and diagnosed immediately after birth.

Concerning type of treatment (method) used for the child before the surgery, the present study revealed that, the majority of the studied children were treated by Ponseti method by stretching and splinting the affected part. This due to Ponseti method is the gold standard for treating clubfoot and can be initiated soon after birth and early medical intervention improves the outcome of clubfoot. This finding agreed with **Kardm et al., (٢٠٢٢)** who found that less than two fifth of the studied children were treated by Ponseti method as the first method of treatment.

Concerning sensitization (the second stage of Continuous Care Model) that held to sensitize and involve the child and family in the care and follow-up process. The present study revealed that, the minority of the studied mothers had adequate knowledge at pre-implementation of CCM regarding clubfoot. Meanwhile, the vast majority had adequate knowledge at post-intervention phase and the majority at follow-up phase.

This result supported with **Chithra, (٢٠١٩)** who found that the vast majority of the studied mothers had inadequate knowledge score at pretest and three quarters of them had adequate knowledge score at posttest. This may be due to the studied mothers had motivation to learn about clubfoot to help their children as clubfoot affect their quality of life and daily activities, which could make their understanding of the club foot easy to grasp and also make it easy to comprehend the consequences of non-compliance to treatment and follow up.

In addition, there were other studies confirm that continuous care model was very effective in improving knowledge level in other diseases such as **Sahebalzamani et al., (٢٠١٧)** who conduct study about "Effects of a Continuous Care Model on Patients' Knowledge and Health-Related Quality of Life in Systemic Lupus Erythematosus" pointed out that continuous care model significantly improved patients' knowledge level after ٣ months (p<.٠٠١) in patients with systemic lupus erythematosus. This is due to CCM is considered a comprehensive care plan improving the mothers' knowledge, attitude, and practice and maintaining the continuity of care.

On assessing mothers' total satisfaction regarding their children undergoing congenital club foot surgery the present study illustrated that, the vast majority of mothers had high level of total satisfaction at post and follow-up respectively. The findings of the present study confirmed that the application of the continuous care model will enhanced levels of satisfaction. Additionally, the ongoing process of sensitization through consistent participation at classes and follow-up care motivated, encouraged, and enabled mothers of children with clubfoot surgery to continue engaging in positive practice and care process that influence on their satisfaction positively.

This finding agree with **Tsironi & Koulierakis, (٢٠١٩)** who conduct study about "Factors affecting parents' satisfaction with pediatric wards" and found that mothers had high level of total satisfaction.

In addition, there were other studies confirm that CCM has a considerable positive impact on the total satisfaction in other diseases such as **Ali et al., (٢٠٢٣)** who conduct study about "Effect of Continuous Care Model on Health-Related Behaviors, Satisfaction and Quality of Life among Infertile Women" pointed out that introducing CCM significantly into practice has a positive impact on satisfaction and quality of life.

According to the results of the present study children's quality of life total mean score improved, when comparing the post-intervention phase and follow-up to the previous intervention phase of the CCM. This may be attributed to the effective implementation of CCM that assists in recognizing the child undergoing clubfoot surgery problems and needs and providing relevant knowledge and skills, which consequently helps in promoting health-related behaviors to monitor and prevent complications of surgery and ultimately improve the quality of life.

In addition, there were other studies confirm that CCM was very effective in improving quality of life in other diseases such as **Sahebalzamani et al., (٢٠١٧)** who pointed out that quality of life in patients with systemic lupus erythematosus improved in all dimensions after ٣ months of applying CCM.

The evaluation phase (the fourth stage of CCM) in which the care and follow-up process were measured through the post-operative complications. The present study revealed that, , all the studied children don't have relapsed foot after one month and the minority of them have relapsed foot after three months of implementation of continuous care model.

This finding agree with **Patil et al., (٢٠٢٢)** who conduct study about "Treatment of Idiopathic Clubfoot by Ponseti Method: A Prospective Evaluation" and found that the minority of them have relapsed foot after three months. This may be due to proper motivation of mothers and their children to accept long term treatment helps to maintain the correction over a period of time and prevents relapse. Regular follow-up visits to the clinic and mothers' involvement in the process of clinical decision making though CCM are considered to be two effective strategies to promote healthy behaviors and improve clinical outcomes.

The current study revealed that, there is a statistically significant difference in post-operative complications on discharge and follow up implementation of continuous care (P < ٠.٠٠١). From the researcher's point of view the CCM in this study enabled the mothers to acquire accurate knowledge which improved mother's self-confidence by increasing their participation in caring for their children and eventually minimize post-operative complications.

Regarding relation between characteristics of the studied mothers and their total knowledge score. The present study revealed that, there is a statistical significant relation between total mothers' knowledge and their age, educational level and consanguinity at intervention per (P= < ٠.٠٠١). While, there is no statistical significant relation between total mothers' knowledge their occupation at (P= > ٠.٠٥).

This finding agree with **Alasbali, et al., (٢٠٢٣)** who found that age was significantly associated with the total mothers' knowledge level (P < ٠.٠٠١), and it was noted that the higher the age, the higher the knowledge level.

Similarly, occupation was associated with knowledge level.

Concerning relation between characteristics of the studied mothers and their total satisfaction score. The present study revealed that, there is no statistically significant relation between total mothers' satisfaction and their age at pre, post and follow-up implementation of continuous care model at (P= > ٠.٠٥). This finding disagree with **Mathias et al., (٢٠٢١)** who conduct study in about "Parent Satisfaction Related to Child's Post-Operative Pain Management" and found that there is a significant relation between total mothers' satisfaction and their age.

Regarding relation between characteristics of the studied children and their total quality of life. The present study revealed that, there is no statistically significant relation between total children's quality of life at intervention per and their age, gender, child ranking, educational level, affected foot and medical history of the siblings

Regarding correlation between total mothers' knowledge score and satisfaction score. The present study revealed that, there is significant statistical positive correlation between total mothers' knowledge score and total satisfaction score at pre, post and follow-up implementation of CCM. This finding supported with **Espinel et al., (٢٠١٤)** who conduct study about "Patient Satisfaction in Pediatric Surgical Care" and found that positive correlations were noted between satisfaction and increased parental knowledge. A key component of improving mothers' satisfaction is educating them about their role in care of their children with clubfoot surgery.

As regard to correlation between total mothers' satisfaction score and total children's quality of life score. The present

study revealed that, there is significant statistical positive correlation between total mothers' satisfaction score and total children's quality of life score at pre, post & follow-up implementation of CCM. This finding supported with **Altiok et al., (٢٠١٩)** who conduct study about "Quality of life, satisfaction with life, and functional mobility of young adults with arthrogryposis after leaving pediatric care" and found that positive correlations identified between the satisfaction and the quality of life. Mothers' who indicated that they were more satisfied had higher scores of quality of life.

Concerning correlation between post-operative complications and total children's quality of life score. The present study showed that, there is significant statistical negative correlation between total children's quality of life score and infection after one month of implementation of CCM. This finding agree with **Chhina et al., (٢٠١٧)** who conduct study about "Quality of Life of Children with Lower Limb Deformities: A Systematic Review of Patient- reported Outcomes and Development of a Preliminary Conceptual Framework" and found that QOL significantly affect the type of deformity, severity of deformity, complications post surgery in of children with lower limb deformities.

Conclusion:

Based on the results of the present study, it was concluded that; continuous care model had a significant positive effect in improving mothers' knowledge and the outcomes of their children undergoing clubfoot surgery. Besides, there is significant statistical positive correlation between total knowledge level & (total satisfaction score of the studied mothers& total children's quality of life score) pre, post and follow up implementation of the continuous care model. Moreover, there is significant statistical positive correlation between total children's

quality of life score& total satisfaction score of them pre, post and follow up implementation of the continuous care model. While, there is significant statistical negative correlation between total mothers' knowledge score and bleeding, infection & hematoma after one month of implementation of CCM. While, there is significant statistical negative correlation between total mothers' satisfaction score and hematoma after one month of implementation of CCM. Additionally, there is significant statistical negative correlation between total children's quality of life score and infection after one month of implementation of CCM. Therefore, the study aim was achieved and study hypotheses were supported.

Recommendations:

- Implement continuous care model in surgical pediatric departments will help children along with their mothers to improve knowledge regarding club foot and their outcomes.
- Inform nurses that continuous follow-up program is needed to support children and mothers to enhance quality of care and reduce post operative complications after surgery.

Recommendations for further studies:
- Future research is suggested to compare the differences between continuous care model and other intervention.

References:

Abdallah, W., & Nassar, M. (٢٠٢٢): Outcome of prenatal diagnosis of clubfoot: a single institution experience, Future Science OA; ٨(٢): FSO٧٧٣. https://doi.org/١٠.٢١٤٤/fsoa-٢٠٢١-٠١٠٦.

Abdou Mar'ei, M. M., El-Kady, R., Holyl, S. M., & Ismail, L. A. S. M. (٢٠٢٢): Talipes Equinovarus surgical Management after Failure of Ponseti

Technique in Children, The Egyptian Journal of Hospital Medicine; ٨٧(١): pp. ١٣٤٨-١٣٥٣.

Akinyoola, L. A., Gunderson, Z. J., Sun, S., Fitzgerald, R., Caltoum, C. B., Christman, T. & Loder, R. T. (٢٠٢٣): The demographics of talipes equinovarus in Indiana, with a particular emphasis on comparisons between clubfoot types, Journal of Pediatric Orthopaedics B; ٣٢(١): pp. ٨-١٤.

Alasbali, M. S., Altammami, A. F., Alharbi, A. A., Aljurfi, M. M., Alhumaidan, A. I., AlKhudhair, M. R. & Alkhalife, Y. I. (٢٠٢٣): Assessing awareness and knowledge level of clubfoot among a rural city population in Saudi Arabia: A cross-sectional study, Journal of Family Medicine and Primary Care; ١٢(١): pp. ٥٥-٦١.

Ali, W. K., Ibrahim, H. I., & Roma, N. Z. (٢٠٢٣): Effect of Continuous Care Model on Health-Related Behaviors, Satisfaction and Quality of Life among Infertile Women, Assiut Scientific Nursing Journal; ١١(٣٩): pp. ٢٢٨-٢٤١.

Almogbil, I., Albaker, A. B., Alrabai, H., Alhasson, M. A., Alwhaid, M. S., Alkadi, S. A. & Alaqil, F. A. M. (٢٠٢١): The Level of Public Awareness About Clubfoot in The Al-Qassim Region and Importance of Early Childhood Intervention: A Cross-Sectional Study. Pak J Med Health Sci, ١٥, ٣٤٦٣-٣٤٦٨.

Altiok, H., Flanagan, A., Krzak, J. J., & Hassani, S. (٢٠١٩): Quality of life, satisfaction with life, and functional mobility of young adults with arthrogryposis after leaving pediatric care, In American Journal of Medical Genetics Part C: Seminars in Medical Genetics; (١٨١)٣: pp. ٤٦١-٤٦٨.

Borji, M., Tavan, H., Azami, M., &Otaghi, M. (٢٠١٦): The effect of continuous care model on blood pressure and quality of life in patients on hemodialysis, Biomedical and Pharmacology Journal; ٩(٢): pp. ٦٨٩-٦٩٥.

Butt, M. N., Perveen, W., Ciongradi, C. I., Alexe, D. I., Marryam, M., Khalid, L. & Sârbu, I. (٢٠٢٣): Outcomes of the Ponseti Technique in Different Types of Clubfoot—A Single Center Retrospective Analysis. Children, ١٠(٨): pp. ١-١٠. Available at : https://doi.org/١٠.٣٣٩٠/children١٠٠٨١٣٤٠, https://www.mdpi.com/journal/children.

Butterworth, M. L., & Marcoux, J. T. (٢٠١٩): The Pediatric Foot and Ankle: Diagnosis and Management, Springer Nature Switzer land; pp.٢١٩- ٢٤٣.

Cady, R., Hennessey, T. A., & Schwend, R. M. (٢٠٢٢): Diagnosis and Treatment of Idiopathic Congenital Clubfoot, American Academy of pediatrics; ١٤٩(٢): pp. ٧٣-٨١.

Chhina, H., Klassen, A., Kopec, J., Park, S., Fortes, C., & Cooper, A. (٢٠١٧): Quality of life of children with lower limb deformities: A systematic review of patient-reported outcomes and development of a preliminary conceptual framework, Journal of Limb Lengthening & Reconstruction; ٣(١): pp. ١٩-٢٩.

Chithra, P. (٢٠١٩): A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge regarding Management of Clubfoot among Mothers of Children in Cure Clubfoot Clinic at Institute of Child Health and Hospital for Children, Egmore, Chennai (Doctoral dissertation, College

of Nursing, Madras Medical College, Chennai).

Chotigavanichaya, C., Eamsobhana, P., Ariyawatkul, T., Saelim, C., & Kaewpornsawan, K. (٢٠١٦): Complications Associated with Ponseti Serial Casting and Surgical Correction via Soft Tissue Release in Congenital Idiopathic Clubfoot, Journal of the Medical Association of Thailand; ٩٩(١١): pp: ١١٩٢-١١٩٧.

Dibello, D., Torelli, L., Di Carlo, V., d'Adamo, A. P., Faletra, F., Mangogna, A., & Colin, G. (٢٠٢٢): Incidence of Congenital Clubfoot: Preliminary Data from Italian CeDAP Registry, International Journal of Environmental Research and Public Health; ١٩(٩): pp. ٥٤٠٦.

Dim, E. M., Edagha, I. A., Peter, A. I., Umoh, I. U., Ituen, A. M., Oforjigha Dim, C. W., & Dim, U. M. E. (٢٠٢٢): Congenital Talipes Equinovarus: A Review, Journal of Orthopedic Surgery and Techniques; ٥(٢): pp. ٤٧٤-٤٨٦.

Espinel, A. G., Shah, R. K., McCormick, M. E., Krakovitz, P. R., & Boss, E. F. (٢٠١٤): Patient satisfaction in pediatric surgical care: a systematic review, Otolaryngology--Head and Neck Surgery; ١٥٠(٥): pp. ٧٣٩-٧٤٩.

Gurnett, C. A., Williams, M. L., & Dobbs, M. B. (٢٠٢٣): Etiology and Pathogenesis of Clubfoot and Vertical Talus. In Clubfoot and Vertical Talus: Etiology and Clinical Management (pp. ١-٢٧). Cham: Springer International Publishing.

Hegazy, M. A., Khairy, H. M., & El-Aidy, S. M. (٢٠١٩): Role of Talectomy in Severe Resistant Clubfoot in Children, J Foot Ankle Surg (Asia Pacific); ٦: pp. ٢٩-٣٨.

Ibrahim, M. A. E., & Abd Elkhair, S. S. (٢٠٢٣): Effect of mothers' empowerment guildelines about caring for children with cast on their knowledge and children selected outcomes, Tanta Scientific Nursing Journal; ٣٠(٣): pp. ٢٣٨-٢٥٦.

Iqbal, M., Rajiv, D., Kamparsh, T., Sarthak, K., & Manish, P. (٢٠٢١): Assessment of awareness and barriers to clubfoot treatment in the Indian scenario, Journal of Family Medicine and Primary Care; ١٠(١١): pp. ٤٢٢٩-٤٢٣٥.

Kardm, S. M. S., Abojlaid, S. H., AlAsiri, A. A. A., Lahiq, L. A., Aldaraani, L. G. A., & AlWatban, W. E. (٢٠٢٢): What Does Aseer Region Community Know About Club Foot, Its Related Risk Factors, And Management Options?, Journal of University Studies for Inclusive Research; ١٠(٢٠): pp. ٤٢٢٢-٤٢٣٨.

Kliegman, R., Geme,G., Blum, N., Shah, S., Tasker, R., & Wilson, K. (٢٠٢٠): Nelson Textbook of Pediatrics, ٢١th ed., Elsevier, Canada, pp. ٣٥٩٨–٣٥٩٩.

Kyle, T & Carman, S (٢٠٢١): Congenital club foot, chapter ٢٢; Nursing care of the child with musculoskeletal disorder, fourth edition., Essential of pediatric nursing, pp. ٧٤٦ - ٧٥٧& ٧٦٩, Philadelphia, PA: Wolters Kluwer.

Landgraf, J., Abetz, L., and Ware, J. (١٩٩٦): The CHQ User's Manual. The Health Institute, New England Medical Center, Boston

López-Carrero, E., Castillo-López, J. M., Medina-Alcantara, M., Domínguez-Maldonado, G., Garcia-Paya, I., & Jiménez-Cebrián, A. M. (٢٠٢٣): Effectiveness of the Ponseti Method in the Treatment of Clubfoot: A Systematic Review, International

Journal of Environmental Research and Public Health; ٢٠(٤): pp. ٣٧١٤.

Mason, R. L. (٢٠١٣): Statistical design and analysis of experiments: with applications to engineering and science (٤٧٤). John Wiley & Sons.

Mathias, E. G., Pai, M. S., Kumar, V., Guddattu, V., & Bramhagen, A. C. (٢٠٢١): Parent Satisfaction Related to Child's Post-Operative Pain Management pp. ١-١٤ DOI: https://doi.org/١٠.٢١٢٠٣/rs.٣.rs-٩٨٨٨٥٥/v١.

Muinde, W. N. (٢٠٢١): Factors Associated with Clubfoot Bracing among Mothers of Children Under Five Years Attending AIC Cure International Hospital in Kijabe, Kenya (Doctoral dissertation, JKUAT-COHES).

Murtaza, K., Saleem, Z., & Malik, S. (٢٠٢٠): Talipes equinovarus or Clubfoot: A review of study approaches, management and trends in Pakistan, Pakistan Journal of Medical Sciences; ٣٦ (٦): pp. ١٤١٤.

Natrajan, M. V. (٢٠١٨): Natarajan's Textbook of Orthopaedics & Traumatology. Wolterskluwer. ٨ th ed. India, Pvt Ltd, pp. ١٥-٢٠.

Oliveira, C. L. D. T., Gonçalves, G. M., & Volpon, J. B. (٢٠٢٣): Evaluation of early treatment of idiopathic clubfoot using the Ponseti method, Acta Ortopédica Brasileira; ٣١: pp. ٢٥٩٨٩٩.

Panahi, L., Khorasgani, A. E., Amiri, M., & Pouy, S. (٢٠٢٢): Effects of Continuous Care Model on Mental Health in Mothers of Children with Cerebral Palsy: A Randomized Clinical Trial, Shiraz E-Medical Journal; ٢٣ (١).

Pandey, V., Singh, A., Gond, A. K., Raikwar, A., Siddiqui, S., & Ali, S. (٢٠٢١):

Clinical presentation of congenital talipes equinovarus via detailed case scenarios, Journal of Bone and Joint Diseases; ٣٦(٣): pp. ٥١.

Patil, A. B., Patil, M. Y., & Nesari, S. S. (٢٠٢٢): Treatment of Idiopathic Clubfoot by Ponseti Method: A Prospective Evaluation, European Journal of Molecular & Clinical Medicine; ٩(٤): pp. ٢٢٥٧-٢٢٦٣.

Qureshi, M. A., Keerio, N. H., Hussain, S. S., Amir, H., Saqlain, U. S., Hameed, M. H., & Shahid, S. (٢٠٢٢): Congenital Talipes Equinovarus (Club Foot): Overview, and Management Options; Journal of Research in Medical and Dental Science, ١٠(١): pp. ٤٧-٥١.

Rudraprasad, M. S., Kiran Rajappa, D. A. S. B., Sangole, C. A., Manjunath, S., & Syed, T. (٢٠٢٠): Analysis of clubfoot clinic at a paediatric tertiary care government hospital in Karnataka, International Journal of Orthopaedics; ٦(١): pp. ٤٦٤-٤٦٩.

Ruzzini, L., De Salvatore, S., Dobbs, M. B., & Costici, P. F. (٢٠٢٣): Congenital Clubfoot. In Textbook of Musculoskeletal Disorders (pp. ١٢٩-١٣٣). Cham: Springer International Publishing.

Sahebalzamani, M., Farahani, H., Jamarani, M. T., Faezi, S. T., Moradi, K., & Paragomi, P. (٢٠١٧): Effects of a Continuous Care Model on Patients' Knowledge and Health-Related Quality of Life in Systemic Lupus Erythematosus, Rehabilitation Nursing; ٤٢(٦): pp. ٩– ١٨. doi:١٠.١٠٠٢/rnj.٢٨٣

Saini, R., Sharma, A., Ravalji, D., Baisoya, K., & Sharma, G. (٢٠٢٣): A Prospective Study on Functional Outcomes of Serial Cast Correction in Congenital Talipes Equinovarus (CTEV) by Ponseti Method, Cureus;

۱٥(۳): pp. ۱-۹ DOI ۱۰.۷۷٥۹/cureus.۳٥۹۸۷.

Singh, S. & Varshney, M. (۲۰۰۸): Evaluation of the Utility of the Ponseti Method of Correction of Clubfoot Deformity in a Developing Nation, International Orthopaedics; ۳۲: pp. ۷٥-۷۹. https://doi.org/۱۰.۱۰۰۷/s۰۰۲٦٤-۰۰٦-۰۲۸٤-۷

Smythe, T., Rotenberg, S., & Lavy, C. (۲۰۲۳): The global birth prevalence of clubfoot: A systematic review and meta-analysis, E Clinical Medicine; ٦۳.

Statistical affairs department in Benha Specialized Pediatric Hospital, ۲۰۲۱

Statistical affairs department in Benha University Hospital, ۲۰۲۱

Tabard-Fougère, A., Bonnefoy-Mazure, A., Dayer, R., Vazquez, O., & De Coulon, G. (۲۰۲٤): The Importance of Having a Single, Dedicated Medical Team to Treat Congenital Talipes Equinovarus Using the Ponseti Method: A Retrospective Analysis of Treatment Outcomes After ۳ Years of Follow-up, Journal of Pediatric Orthopaedics; ۱۰- pp.۱۰۹۷.

Tsironi, S., & Koulierakis, G. (۲۰۱۹): Factors affecting parents' satisfaction with pediatric wards, Japan journal of nursing science; ۱٦(۲): pp. ۲۱۲-۲۲۰.

Udemezue, C.O., Amaraegbulam, P.I., Madu, K.A. and Isikaku, E. (۲۰۲۳): Ponseti Treatment of Bilateral Idiopathic Clubfoot: Does the Hand Dominance of the Provider Make a Difference?, Journal of Biosciences and Medicines; ۱۱: pp. ۱-۸. https://doi.org/۱۰.٤۲۳٦/jbm.۲۰۲۳.۱۱۳۰۰۱

Ugorji, T., Ifeanyi, N. & Anoliefo, K. (۲۰۲۰): Epidemiology and Pattern of Clubfoot in Enugu, South-East Nigeria, American Journal of Biomedical Science & Research; ۱۱(۲): pp. ۱۹۰-۱۹۳. AJBSR.MS.ID.۰۰۱٦۱۹. DOI: ۱۰.۳٤۲۹۷/AJBSR.۲۰۲۰.۱۱.۰۰۱٦۱۹.

World Health Organization. (۲۰۲۰): Global health estimates ۲۰۲۰: deaths by cause, age, sex, by country and by region, ۲۰۰۰–۲۰۱۹.

Ygge, B. M., &Arnetz, J. E. (۲۰۰۱): Quality of paediatric care: application and validation of an instrument for measuring parent satisfaction with hospital care, International Journal for Quality in Health Care; ۱۳(۱): pp. ۳۳-٤۳.

تأثير نموذج الرعاية المستمرة علي معلومات ورضا الأمهات ونتائج أطفالهن الذين يخضعون لجراحة حنف القدم

(١) رقيه عفيفي عبد الفضيل عفيفي، (٢) أ. د. فاتن شفيق محمود و (٣) أ. د. امال غريب سباق

(١) مدرس مساعد تمريض الأطفال، كلية التمريض، جامعة بنها، (٢) أستاذ تمريض الأطفال ، كلية التمريض، جامعة بنها، (٣) أستاذ تمريض الأطفال ، كلية التمريض، جامعة بنها.

الخلاصة

الخلفية: حنف القدم الخلقي له تأثير كبير على الأداء البدني وحياة الطفل المصاب ويؤدي إلى انخفاض جودة الحياة للطفل. إحدى طرق تحسين جودة الحياة هي استخدام نموذج الرعاية المستمرة. **الهدف:** تقييم تأثير نموذج الرعاية المستمرة على معلومات الأمهات ورضاهن ونتائج أطفالهن الذين يخضعون لجراحة حنف القدم. **تصميم الدراسة:** تم استخدام التصميم شبه التجريبي لإجراء هذه الدراسة. **مكان الدراسة:** أجريت الدراسة في عيادات العظام الخارجية وأقسام جراحة العظام في مستشفى بنها الجامعي ومستشفى بنها التخصصي للأطفال. **الموضوع:** عينة غرضية مكونة من ٥٠ طفلاً برفقة أمهاتهم. **الأدوات:** تم استخدام أربع أدوات لجمع البيانات: استبيان المقابلة الشخصية، ، استبيان رضا أمهات الأطفال، استبيان صحة الطفل وورقة مضاعفات ما بعد الجراحة. **النتائج:** هناك علاقة إيجابية ذات دلالة إحصائية بين إجمالي معلومات الأمهات ورضاهن وجودة الحياة وبين رضا الأمهات الإجمالي وجودة حياة الأطفال في مرحلة ما قبل وبعد ومتابعة تنفيذ نموذج الرعاية المستمرة. كما وجد ارتباط سلبي بين معلومات الأمهات ورضاهن وجودة حياة الأطفال ومضاعفات ما بعد الجراحة بعد شهر واحد من تطبيق نموذج الرعاية المستمرة. **الخلاصة:** كان لتطبيق نموذج الرعاية المستمرة تأثير إيجابي كبير في تحسين معلومات الأمهات ورضاهن ونتائج أطفالهن الذين خضعوا لجراحة حنف القدم. **التوصيات:** يجب دمج نموذج الرعاية المستمرة كتدخل تمريضي للأطفال الذين يخضعون لجراحة حنف القدم.
.