Development and Monitoring the Key Performance Indicators of the Quality of Care for Patients with Cleft Lips/Palates at Srinagarind Hospital

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Background: *Congenital deformities, such as cleft lips and/or cleft palates (CLP), have high incidences in the Northeast of Thailand. These birth defects can affect patient's quality of life. CLP patients need crucial and long-term treatments by a multidisciplinary team starting from prenatal stage to late adulthood. Patients and their families should involve in their own care, and their care objectives should correspond with healthcare providers. Besides the clinical outcome of interdisciplinary team, key performance indicators (KPIs) need to be developed in the hospital service unit in order to improve quality of care and treatment outcomes.*
Objective: *1) to establish KPIs in hospital service units, and 2) to develop the information system to collect, analysis and improve the quality of CLP care.*
Material and Method: *A nurse coordinator was appointed in the Tawanchai Center to coordinate care. The three periods were conducted for the nurse coordinator to work with nine service units in Srinagarind Hospital for consensus on both qualitative and quantitative data to be used as service unit quality measurement.*
Results: *Thirty one KPIs from nine service units were established, collected and analyzed during a four-month period in 2014. The 20 KPIs achieved the unit targets. Two PKIs of the rates of complication with anesthesia during/after surgery in the first 24 hours and the rates of patient/caregiver's satisfaction in acquiring information from the officer were improving. There were 11 KPIs that did not achieve the targets. The coordinator nurse of the Tawanchai Center discussed with the service unit for the cause and how to improve the outcome.*
Conclusion: *The monitoring KPIs will lead to improvement of outcome for better patient quality as well as benchmarking with other hospitals of Cleft Center. The KPIs from hospital service units with the monitoring and analysis of information by the nurse coordinator will enhance and lead to improvement of the quality of the patients and family centered care process.*

Keywords: *Key performance indicator, Cleft center and nurse coordinator, Quality of care, Cleft lip and cleft palate*

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Congenital anomalies such as cleft lips and cleft palates (CLP) have high incidences in the Northeast of Thailand (2.49/1,000 newborns)[1]. The ultimate goal of CLP care is restoration of the patient as far as possible to a "normal" life, under hindered by handicap or disability[2]The treatment depends on crucial time and it takes critically long-term management starting from prenatal period until 19 years of age with a competent multidisciplinary team in order to achieve a satisfactory result for patients and their families. This long-term management plan and the process may bring challenges for patients and their loved ones. To improve the multidisciplinary care for children with CLP, a set of guidelines is needed. Consensus on additional quality indicators of CLP care should be reached[3].

The management plan involving multidisciplinary team alleviates patient's anxiety and aims to achieve quality outcomes including pleasant quality of life, pleasing face, a normal speech and arrangement of teeth. This in turn helps patients to have a normal psychosocial development and better social

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acceptance. A multidisciplinary team provides adequate support for patients and their familiesto overcome the challenges during this lengthy treatment process[4]. This multidisciplinary team care has been received persistently with enthusiasm from people in/outside of the country.

Tawanchai center

Srinagarind Hospital has provided surgical care to about 150 cases of CLP. The hospital statistical data since 1984 till present date revealed a total of 2,153 patients have received corrective surgeries (3,545 times), accounting for approximately 150 patients per calendar year. Interestingly, in the last few years the numbers have increased from 150 up to 250 patients per year. There were 1,000 outpatient follow-ups from 300 to 400 patients[5]. The formulated treatment plan for CLP was established in Srinagarind Hospital in 1986[6].The Tawanchai Center (under the Tawanchai Royal Granted Project) was established through collaborative work and as the first centre with a comprehensive interdisciplinary team for the treatment of CLP in Thailand[7].

Guidelines for long-term management and follow-up of CLP have been developed in conjunction with regular meeting in the clinic. The coordinator function with interdisciplinary team management and regular cleft clinic meeting is the most important in CLP management. The interdisciplinary protocol and patient care centered management has been developed[7-10].

The "Tawanchai Project" was establish in as a special honor to Her Royal Highness Crown Princess Maha Chakri Sirindhorn, and intended to assist development of CLP care in Thailand including the two activities: Khon Kaen University Cleft Lip-Palate and Craniofacial Center, and the Society of Cleft Lip-Palate. Nursing care system was developed and comprised psychosocial care, breastfeeding, counseling, providing assistance in various ways in order to respond to problems of patients/families by the multidisciplinary team[11-15]. Nursing care was provided by a team of trained nurses at the CLP, Srinagarind Hospital that covered a wide range of health aspects. An individual nurse in different organization is in charge to create the manual, protocol, and guidelines of nursing practice[14]. The nursing staff focused mostly on challenges rose from antenatal and perinatal care, developmental issues, family relationships and spiritual healings. Nursing care was aimed for patients and families to receive a quality care and better social acceptance[14]. They also provided educational resources for patients with CLP. Nursing care, therefore, as a part of the multidisciplinary team is essential and crucial for CLP patients.

The "Smart Smile & Speech Project", which commemorated the 50th Birthday Anniversary of Her Royal Highness Princess Maha Chakri Sirindhorn has encouraged families with facial deformities to perceive their right to health by reaching out a healthcare center. Incentives provided by Red Cross for transportation to hospital visits increased number of patient visits[16,17].

The clinical expertise accumulates from years of experiences, studies, works and training in health care with patients/clients. Meanwhile, patients/clients relate to their values and preferences. Methods to evaluate patients outcome of interdisciplinary outcome has been used including the THAICLEFT Outcome study[9,10,18]. The assessment of clinical outcome of the Center was reported including the surgical outcome[19], the speech and hearing outcome[20-22], orthodontic outcome[23-25], alveolar bone grafts[26], oral health status[27], nursing outcome[28], development and psychosocial outcome[29,30], patients and patens' satisfaction[31,32], quality of life[22,33,34], and cost management[35].

For the present study the researchers have investigated, developed, and established the information system of quality of care for patients with CLP at Srinagarind Hospital. The hospital performance indicators help in achieving an expected goal and to develop a next level of quality medical care by finding and remedying[36].

Objective

This study are to establish the key performance indicators (KPIs) for measuring quality of cleft care and to develop information system to collect, analyze and improve CLP care processes.

Material and Method

The system perspectives are important on strategic directions and on patients and their family. It helps the Center to monitor, respond to, and manage performance to improve our overall performance and our focus on patients and their family[37]. The cleft care processes were divided to the key process linkages to clinical outcome and key supported processes. The patients' care flowchart was established. There were 9 hospital units that were most important for process of cleft care. The customer requirement and parameter to improve quality of outcome was used for the Process Requirements. The key performance indicators were

used to control and improve the work processes, related to patients and family quality and performance.

Consensus on KPIs was developed by a participatory action research (PAR). KPIs, included qualitative and quantitative data, from 9 hospital units, including the prenatal clinic, the labour room, the post-labour room, the family planning clinic, the surgical ward, the operating room, the anesthesia unit, the Tawanchai Cleft Center and the surgical OPD, were collected and analyzed by the Tawanchai Center's nurse coordinators.

The study divided into three periods:

1) October to December 2013: Field research was conducted. Conferences, meetings and problem-learning process, which participants engaged, were utilized. The two sample groups are patients and families, and nurses.

2) January to February 2014: The data gained from the first period were used to consensus of a total number of 31 KPIs (Table 1) and data information management system.

3) March to June 2014: The 31 KPIs were collected from the nine units in Srinagarind Hospital, for four months. The KPIs were collected and analyzed.

Researchers and other health professionals recorded data regularly. Every organization was able to access to the key performance index via the website: http://kkucleft.kku.ac.th/. The data were calculated into percentage and then recorded in the database every month. The nurse coordinator from Tawanchai Center reviewed and analyzed the KPIs.

This study was approved by the Khon Kaen University Research Ethic Committee.

Results

The key performance index of quality of care for patients with CLP in nine units was presented in Table 1.

There 20 KPIs (62%) that achieved the unit target and all KPIs from the labour room, the family planning clinic, the operating room and the anesthesia Unit (Table 1).

The rates of complication with anesthesia during/after surgery in the first 24 hours had been improving from 4.5% in the first month because the concern of anesthetic team in setting of the protocol and prevention of complication. The rates of patient/caregiver's satisfaction in acquiring information from the officer were also improving due to the convenience of information access and availability of supporting staff.

There were 11 KPIs that did not achieved the targets, including the rates of giving birth of pregnant women with CLP child, the rates of receiving the information of pre-post operation in wards, the rates of satisfaction of patient/family in wards, the rates of perceiving the treatment protocol in patient/caregiver, rates of preparation of pre-operative care in patient/caregiver and the rates of patients/care givers received the guidelines and appointment calendar and the rates of rates of overall satisfaction of patient/family. The coordinator nurse of the Tawanchai Center discussed with the service unit for the cause and how to improve the outcome.

Discussion

For the present study, only 20 KPIs achieved the unit target. Some KPIs could not be monitored and evaluated such as the rates of giving birth in pregnant women with CLP child. Even though, they received counseling at the Antenatal Care Clinic, monitoring the place of delivery was still inconvenient and incomplete. On admission day at the hospital, the treatment for complications including pneumonia and fever for many pregnant women had failed to meet the objectives. Since the Srinagarind Hospital is a tertiary care unit, a number of patients with severe CLP underwent nasoalveolar molding before receiving cheiloplasty aiming for the optimum outcomes. It is also necessary for patients to receive adequate treatment for coexisting defects, which may affect the outcomes.

Patients from the hospital without appropriate referral papers could not receive treatment. Poor communications may have resulted in differences in the rates of patient/caregiver for their treatment protocols and pre-op preparations. Overwhelming with the numbers of patient and insufficient numbers of specially-trained nurses are possible explanations. The rates of overall satisfaction of patient/family failed to achieve the target. The possible explanations may include long waiting-time, overcrowding of the servicing place and differences in officers and patients ratio. Families including patients need relevant knowledge and encouragement. This support may motivate them to endure the long-term treatment journey with less distress.

Only evidence-based treatment modalities should be adopted and outcome should be patient centered. To integrated "patient values" with the best clinical evidence. A participatory action research (PAR)[39] was used to gain new knowledge and to solve problems, emphasizing the contribution of society

Table 1. The key performance indicators (KPIs) of quality of care for patients with CLP in nine units

The KPIs	Units target (%)	Outcome (%)			
		March 2014	April 2014	May 2014	June 2014
The prenatal clinic					
1) Rates of pregnant women in the risk group of CLP who received advanced obstetric ultrasound at 18-20 weeks of pregnancy*	100	100	0**	100	0**
2) Rates of women who underwent ultrasound with CLP received counseling in order to have chromosome check up*	100	100	0**	100	0**
3) Rates of pregnant women received suggestions when they underwent ultrasound check with CLP*	100	100	0**	100	0**
4) Rate of the referral to the Tawanchai Cleft Center in pregnant women who received diagnosis with CLP	100	0**	0**	100	0**
5) Rates of giving birth of pregnant women with CLP child	80	0**	0**	0**	0**
The labour room					
6) Rates of building up the relationship between mother and baby with CLP*	100	100	0**	100	100
7) Rates of the acceptance between mother and baby with CLP*	80	100	0**	100	100
The post-labour room					
8) Rates of building up the relationship between mother and baby with CLP*	100	100	0**	100	100
9) Rates of the acceptance between mother and baby with CLP*	80	100	0**	100	100
10) Mother can be able to raise the child with CLP by only breastfeeding in hospital/and only breastfeeding during three months*	100/50	100/100	0**	100/50	100/0**
11) Parents perceived the treatment protocol of CLP care*	100	100	0**	100	100
The family planning clinic					
12) Rates of receiving the information of family planning*	100	100	100	100	100
13) Rates of receiving the information of genetic transmission*	100	100	100	100	100
The surgical ward					
14) Rates of admission at the hospital within 2-4 days (CL/CP)	>90	87.50/ 64.2	100/75	100/75	100/ 84.2
15) Rates of wound infection*	<5	0	0	0	0
16) Rates of pain management in wards*	100	100	100	100	100
17) Rates of receiving the information of pre-post operation in wards	100	98.48	100	96.21	99.50
18) Rates of satisfaction of patient/family in wards	>85	87.50	93.99	90	85
The operating room					
19) Rates of complication/residue in surgical wound*	0	0	0	0	0
20) Rates of complication from the surgical gestures*	0	0	0	0	0
21) Rates of the postponed appointments due to unavailable instruments*	0	0	0	0	0
The anesthesia unit					
22) Rates of complication with anesthesia during/after surgery in the first 24 hours*	<5	4.5	0	0	0
23) Rates of pain management in the first 24 hours*	100	100	100	100	100
Tawanchai cleft center and Surgical OPD					
24) Rates of patients who received Cheiloplasty at 3-6 months	100	100	100	100	75
25) Rates of patients who received Palatoplasty at 10-18 months	100	100	100	100	70
26) Rates of perceiving the treatment protocol in patient/caregiver	100	84	82	82.50	83.53
27) Rates of preparation of pre-operative care in patient/caregiver	100	80	88	85	85.88
28) Rates of patient/caregiver who has a continuous follow-ups*	>90	92	92	92.50	91.76
29) Rates of patient/caregiver's satisfaction in acquiring information from the officer*	>85	88	89	90	91.76
30) Rates of patients/care givers received the guidelines and appointment calendar	100	84	89	92.50	88.24
31) Rates of overall satisfaction of patient/family	> 85	100	100	100	75

* The 20 KPIs which achieved the unit targets, ** Collection is processing but there is no patients to come

(organizations/patients) and co-workers in the research process. The learning process has been developed from opinions and feedbacks of patients and the strong participation of every organization. Qualitative researches methods can be used as a set to complementary tools bringing issue encourage the self-evaluation of professional beliefs and behavior in relation to the provision of care[39].

Rather than bringing value to questions such as the evaluation of the effectiveness of treatment, the worth of qualitative research is recognized for questions concerned with issues such as the appropriateness of care, or understanding lay/personal beliefs and behaviors in the social setting[40]. Additionally, the cost concern has to be address as there is also little evidence to suggest that the extra burden imposed on patients and the financial cost of these interventions is justified by any significant benefit[41].

The development and monitoring the KPIs of quality of care for patients with CLP at Srinagarind Hospital were achieved through the use of participatory action research (PAR). The finding is relevant to Ketkeaw's study[29] which found that the participant involvement could make a strong contribution to develop a KPI. Moreover, it is found that a KPI that was developed in this study is suitable to use in the hospital, and three KPIs are relevant to the hospital index, including rates of infection in the hospital, the levels of patient's satisfaction, and the average length of stay.

Although there were challenges including missing reports, it was overcome by monitoring and systematically continuously evaluating for the KPIs by different organizations. Monitoring and evaluating the thirty-one KPIs during four months might be too early to analyze the outcome and a long-term study and further evaluations are required for future perspectives.

The recording the KPIs for the preliminary period has covered most aspects of quality of care. There were nine hospital service units under Srinagarind Hospital, applying thirty-one KPIs and it was found that 20 feasible KPIs were implemented. It is planning that, for the nest period, the preliminary outcome of KPIs was examined and an improvement of the information system was achieved in order to record the data including analyzing the percentages automatically.

Conclusion

The monitoring KPIs will lead to process effectiveness and efficiency and improvement of outcome for better patient quality. The good outcome from a service unit can be benchmarked with other hospitals of Cleft Center. The analysis if KPIs that are not achieved the unit target and adverse trend will lead to improvement and redesign of the process. The KPIs from hospital service units with the monitoring and analysis of information by the nurse coordinator will enhance and lead to improvement of the quality of the patients and family centered care process.

What is already known on this topic ?

The KPIs was primarily established in each of nine units. However, all indexes have never been integrated or approved by a multidisciplinary team. As a result, a process of care for patients with CLP can't be in the same direction.

What does this study adds ?

This study has developed 31 KPIs which are approved by nurses who work in nine units. Twenty of the KPIs are successfully accomplished. However, the rest of the KPIs need a future development, especially the 24^{th}-27^{th} KPIs, so that the ultimate goal of care for patients with CLP can be achieved in the future.

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Potential conflicts of interest

None.

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การพัฒนาและติดตามสารสนเทศตัวชี้วัดคุณภาพการดูแลผู้ป่วยปากแหว่ง เพดานโหว่ โรงพยาบาลศรีนครินทร์

ศิริพร มงคลถาวรชัย, สุธีรา ประดับวงษ์, ดาราวรรณ อักษรวรรณ, พรเพ็ญ ปทุมวิวัฒนา, วรัญญา สร้อยหิน, สุมาลี พงศ์ผกาทิพย์, จำรัส วงศ์คำ, จันทิรา วชิราภากร, เกสร เหล่าอรรคะ, ทิพยวรรณ มุกน่ำพร, บวรศิลป์ เชาวน์ชื่น

ภูมิหลัง: ความพิการแต่กำเนิดโดยเฉพาะปากแหว่งเพดานโหว่ มีอุบัติการณ์ที่สูงในภาคตะวันออกเฉียงเหนือของประเทศไทย ความพิการเหล่านี้มีผลกระทบต่อคุณภาพชีวิตของผู้ป่วย ผู้ป่วยปากแหว่งเพดานโหว่มีความต้องการการดูแลเป็นอย่างดีโดยทีมสหวิทยาการตั้งแต่ระยะตั้งครรภ์จนถึงวัยเป็นผู้ใหญ่ ผู้ป่วยและครอบครัวควรมีส่วนร่วมในการดูแล โดยมีวัตถุประสงค์เช่นเดียวกับทีมสหวิทยาการ นอกจากผลการรักษาทางคลินิกโดยทีมสหวิทยาการแล้ว ตัวชี้วัดของหน่วยงานด้านการบริการพยาบาลจำเป็นต้องมีการกำหนดขึ้น เพื่อเป็นการปรับปรุงคุณภาพและผลลัพธ์ของการดูแลรักษา

วัตถุประสงค์: 1) เพื่อกำหนดตัวชี้วัดของหน่วยงานด้านการบริการพยาบาลของโรงพยาบาลและ 2) เพื่อพัฒนาระบบสารสนเทศ ในการรวบรวมและวิเคราะห์เพื่อปรับปรุงคุณภาพการดูแลผู้ป่วยปากแหว่ง เพดานโหว่

วัสดุและวิธีการ: พยาบาลประสานงานของศูนย์ตะวันฉาย ทำหน้าที่ในการประสานการดูแลผู้ป่วย การศึกษาดำเนินการเป็น 3 ช่วงเวลา โดยพยาบาลประสานงาน ดำเนินการร่วมกับหน่วยงานด้านการบริการพยาบาลที่รับผิดชอบการดูแลผู้ป่วยปากแหว่งเพดานโหว่ ของโรงพยาบาลศรีนครินทร์ จำนวน 9 หน่วยงาน เพื่อทำข้อตกลงในการกำหนดตัวชี้วัดของหน่วยงานที่เป็นทั้งตัวชี้วัดเชิงคุณภาพและเชิงปริมาณ

ผลการศึกษา: ตัวชี้วัด 31 ตัว ได้รับการกำหนดขึ้นและมีการเก็บรวบรวมและวิเคราะห์ในช่วงเวลา 4 เดือน ในปี พ.ศ. 2557 ตัวชี้วัด 20 ตัว บรรลุเป้าหมาย ตัวชี้วัด 2 ตัว คือ อัตราการเกิดภาวะแทรกซ้อนของการให้วิสัญญีระหว่างผ่าตัดและหลังผ่าตัด 24 ชั่วโมง และอัตราความพึงพอใจต่อการให้ข้อมูลของเจ้าหน้าที่ดีขึ้นอย่างต่อเนื่อง มีตัวชี้วัดจำนวน 11 ตัวชี้วัดที่ยังไม่บรรลุเป้าหมาย พยาบาลประสานงานของศูนย์ตะวันฉายจะมีการวิเคราะห์ร่วมกับหน่วยงานถึงสาเหตุ และนำไปปรับปรุงกระบวนการต่อไป

สรุป: การติดตามตัวชี้วัด ได้นำไปสู่การปรับปรุงคุณภาพและผลลัพธ์การรักษาของผู้ป่วย และสามารถนำไปเทียบเคียงกับโรงพยาบาลและศูนย์การดูแลแห่งอื่นๆ ตัวชี้วัดของหน่วยงานการบริการพยาบาล ซึ่งมีการติดตามและวิเคราะห์โดยพยาบาลประสานงานของศูนย์การดูแลอย่างสม่ำเสมอจะช่วยส่งเสริมให้เกิดการปรับปรุงคุณภาพ ของการดูแลที่เน้นผู้ป่วยและครอบครัวเป็นศูนย์กลางได้เป็นอย่างดี