

Utilization of Alderete's Score Chart in Monitoring Post Anesthesia Patients: Are Nurses Utilizing the Monitoring Tool?

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Abstract: Background: Anesthesia and surgical techniques have advanced leading to improvement of patients' care after surgery. Alderete's scoring tool was introduced in May 2018 at Kenyatta National Hospital to determine the suitability of patients for discharge to the post-surgical wards. Introduction of the monitoring tool was necessary due to the fact that patients were deteriorating after anesthesia after developing complications. There was also no standard monitoring tool that had been adopted. Alderete's scoring system includes assessing a patient's responsiveness, activity, respiration, blood pressure and oxygen saturation level. Since the introduction of the monitoring tool, no study has been done to assess its utilization in monitoring patients. **Methods:** A descriptive cross sectional study was conducted among nurses working in post anesthesia care unit of Kenyatta National Hospital. A total of 73 nurses were sampled for the study. Data was collected using interviewer-administered questionnaires and analyzed using Statistical Package for Social Sciences (SPSS) version 20. **Results:** The nurses comprised of 56% females and 45% males. The mean age of the participants was 38 years. There was no significant relationship between the use of Alderete's score chart and level of training at confidence interval of $p=0.210$. However 85.7% of BScN trained were able to use the chart followed by 82.4% of KRPN trained nurses. This implied that those with higher training understood the importance of using the Alderete's chart more than the lower level of training. There was significant statistical evidence at $p=0.028$ that the use of Alderete's score chart depended on training of staffs and those who were trained were 1.488 times more likely to use the tool than those who were not trained. **Conclusion:** Alderete's score chart was being used by nurses to monitor patients even though most of the nurses had not been trained on its utilization and therefore did not understand the components of the chart. Staff shortage and lack of supplies also hindered utilization of the monitoring tool.

Keywords: Utilization, monitoring, post anesthesia care unit, effectiveness, efficiency.

Background

Alderete's score chart has been in use worldwide for over forty five years. Twenty four years ago, an improved version of the tool was introduced following advances in anesthesia and surgical techniques. It was introduced in 1970 by Jorge Antonio Alderete, who was a Mexican anesthesiologist working at the Denver's Veteran Affairs Hospital [1]. Before the introduction, there was no recognized tool for monitoring post anesthesia patients. Dr. Alderete saw the requirement of a standardized monitoring tool that could be used to monitor surgical patients worldwide. In the countries where the tool has been in use like the United States of America, it has been effective in detection of any deviation from the normal parameters leading to effective and prompt interventions

thus preventing post anesthesia complications and subsequent deaths. The use of Alderete's score chart has provided use of a standardized tool that provides consistency in monitoring thus reducing errors that may occur after anesthesia [1].

Alderete's score chart is a new tool for observation of post anesthetic patients at Kenyatta National Hospital (KNH). The chart was introduced in the month of May 2018 when it was realized that there was no standard observation tool for post-operative patients to meet international guidelines [2]. Initially the post anesthesia care nurses used to record the vital signs observations on the anesthetic chart and the other general observations on the patients' cardex.

Alderete's scoring system includes assessing a patient's responsiveness, activity or movement of limbs, respiration, blood pressure and oxygen saturation level as determined by pulse oximetry. A score of 0 to 2 is given for each of the five categories assessed and a score of 8 to 10 is considered adequate for discharge of the patient from the post anesthesia care unit to the post-surgical ward. A patient with a score of less than 8 is considered not ready for discharge and has to be monitored until a desired score is achieved.

Factors that have so far affected utilization of Alderete's score chart include patients' factors including pre-operative condition and presence of co-morbidities. Staff factors that have affected utilization of the monitoring tool include knowledge, skills and attitude towards the use of the chart. Institutional factors have also affected the utilization of monitoring tool and these are policies governing the use of the tool and supply of resources necessary for the utilization of the scoring tool [3].

Methodology

A descriptive cross sectional study was conducted among nurses in post anesthesia care unit Main theatres at KNH. A sample size of 73 nurses was systematically selected to participate in the study. Data was collected using self-administered questionnaires from nurses and the theatre in charge. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics were presented in frequencies and percentages. Qualitative data was coded using assigned numbers to the responses then arranged in groups into emerging patterns and analyzed using thematic analysis. Propositions and conclusions were made and results presented in form of tables, pie charts and narrative texts.

Results

Gender of respondents

The participants consisted of 56% (n=40) females and 45% (n=33) males. This is shown in Figure 1 below.

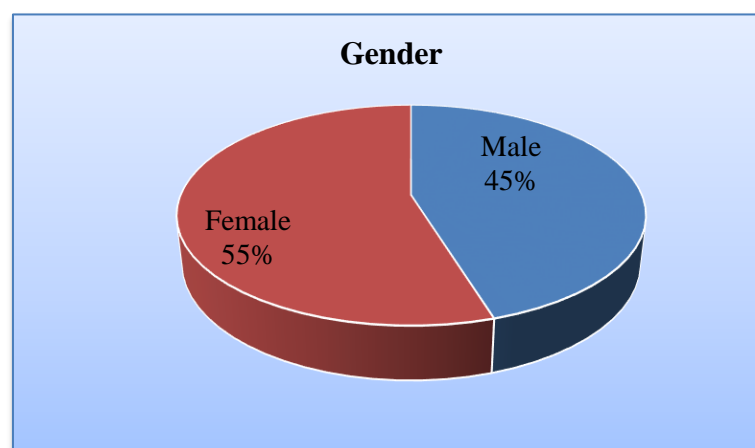


Figure 1. Distribution of respondents by gender

Professional qualification of respondents

As shown on Figure 2 below, the respondents had varying professional qualifications ranging from Diploma to Masters. Slightly more than a half of the respondents 52% (n=38) had diploma qualification, 23% (n=17) had higher diploma training in perioperative nursing (KRPON), 19% (n=14) had BScN qualification, 4% (n=3) had KRN/M qualification while only one respondent 2% had attained Masters Qualification.

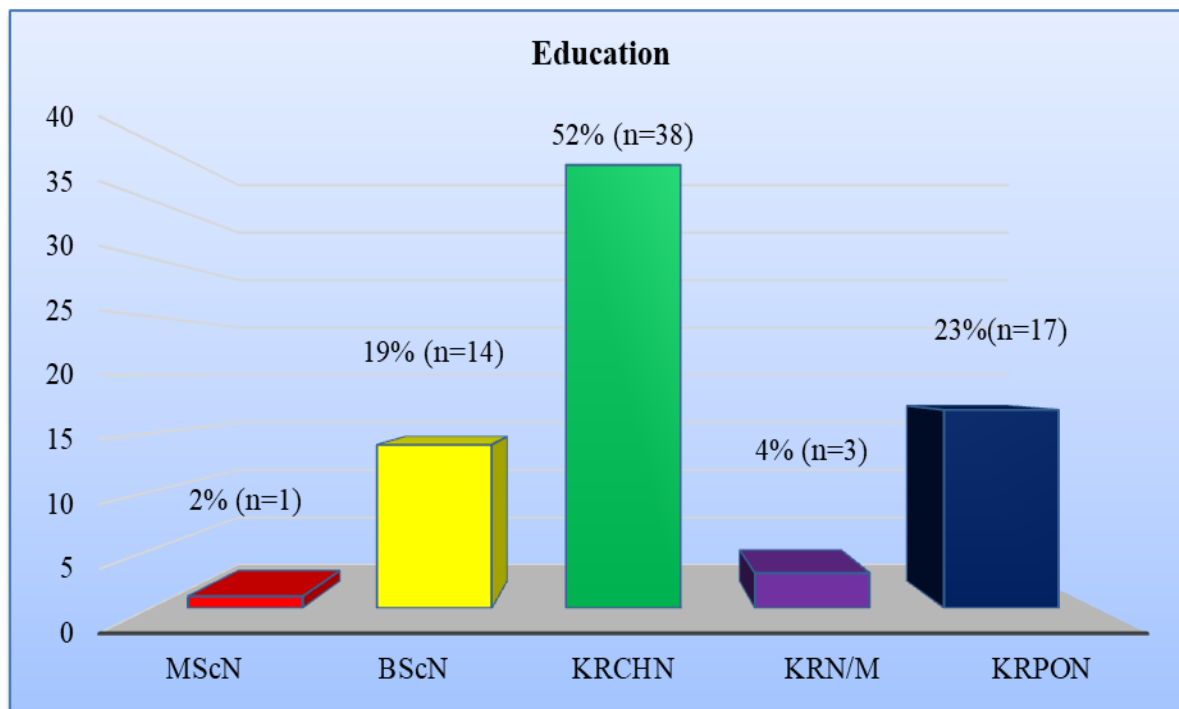


Figure 2. Distribution of respondents' professional qualification

There was no significant relationship between use of Alderete's score chart and level of training at $P=0.210$ as shown on Table 1 below. However 85.7% of BScN trained were able to use the chart followed by 82.4% of KRPON trained nurses. This implied that those with higher training (post basic diploma) understood the important of using the Alderete's chart more than the lower entry level nurses.

Table 1. Association of use of Alderete's score chart and level of training

		Do you use the Alderete's score chart		p-value
		Yes	No	
Level of Training	MScN	1	0	0.210
	BScN	12	2	
	KRCHN	25	13	
	KRN/M	1	2	
	KRPON	14	3	

General knowledge on Alderete's score chart

A large proportion of the respondents 85% (n=61) working in theatre had no training on the use of Alderete's chart as shown on Table 2 below. The respondents who had at least two hours of training in Alderete's score chart were 15% (n=11).

However, 93% (n=53) used the chart to monitor patients post anesthesia despite lack of training on its use. Of those who used Alderete's charts 96% (n=51) understood when to fill in the chart and discharge the patient from post anesthesia care unit.

Table 2. General Knowledge on Alderete's score chart

S. No.	Participant understanding of Alderete's score chart	Yes	No
1	Have you had any training on the use of Alderete's score chart?	15% (n=11)	85% (n=61)
2	Do you use the Alderete's chart to monitor post anesthesia patients?	73% (n=53)	27% (n=20)
3	Does the patient condition affect the use of Alderete's chart?	39% (n=27)	61% (n=42)
4	Does the time taken to fill the chart affect the performance of other nursing procedures?	18% (n=13)	82% (n=60)
5	Is there any improvement that can be made on the chart?	24% (n=16)	76% (n=52)

Association on use of Alderete's score chart and Alderete's score chart training

There was significant statistical evidence $P=0.028$ that the use of Alderete's score chart depends on the training of staffs on its use as evidence in the odds ratio showed that those nurses using the Alderete's score chart were 1.488 times more likely to have been trained on the use of the chart than those who were not trained on its use. This is shown on Table 3 below.

Table 3. Association on use of Alderete's score chart and Alderete's score chart training

		Do you use the Alderete's score chart		P-Value
		Yes	No	
Any training on Alderete's chart	Yes	11	0	0.028
	No	41	20	

Attitude and perception of respondents towards hospital support

Most of the study participants 66% (n=47) strongly agreed with the hospital policy on the use Alderete's score chart to monitor post anesthesia patients with another 25% (n=18) agreeing with the same statement. However 6% (n=4) did not agree or disagree with the statement as another 2% (n=2) disagreed with the statement. A large number 97% (n=69) agreed that all theatre nurses should be trained on how to use the score chart and it should be mandatory for all nurses to monitor post anesthesia patient using the chart as evident by 78% (n=48) who supported the statement in the table 4 below. Despite lack of training, 59% (n=35) of the study participants still believed that they had confidence using the chart. However 41% (n=24) had no confidence using the chart. Of note was that more than half of the participants 59% (n=42) did not understand the components of Alderete's score chart and a further 4% (n=3) of the participants. Most of the study participants were also positive that use of the chart was not cumbersome as 65% (n=45) disagreed with the statement.

Though the hospital supported the use of Alderete's score chart, more emphasis should be put by the hospital in improving the number of nurses as shortage of nurses had been identified as hindrance to use of the score chart. This information is given on Table 4 below.

Table 4. Attitude and perception of respondents towards hospital support

	Strongly Agree %(n)	Agree %(n)	Neutral %(n)	Disagree %(n)	Strongly disagree %(n)
Alderete's score chart should be used in monitoring Post anesthesia patients	66%(47)	25%(18)	6%(4)	1%(1)	1%(1)
All theatre nurses should to be trained on the use of Alderete's score chart	79%(56)	18%(13)	0	1%(1)	1%(1)
It should be mandatory for nurses to	34%(21)	44%(27)	15%(9)	5%(3)	2%(2)

monitor patients using the Alderete's chart					
I am confident in using the chart	27%(16)	32%(19)	27%(16)	12%(7)	2%(2)
I understand the components of Alderete's score chart	27%(16)	12%(7)	4%(3)	51%(36)	8%(6)
There is adequate time to monitor patients using Alderete's chart	12%(9)	36%(26)	26%(19)	19%(14)	7%(5)
Monitoring patients using Alderete's chart is cumbersome	6%(4)	23%(16)	7%(5)	49%(34)	16%(11)
More emphasis should be put by the hospital to use Alderete's Chart	41%(29)	46%(32)	7%(5)	4%(3)	1%(1)
Hospital is supporting use of Alderete's chart by availing tools and equipment's needed.	34%(24)	27%(19)	15%(11)	15%(11)	8%(6)
Shortage of nurses hinders the use of Alderete's chart in the hospital	51%(36)	30%(21)	6%(4)	6%(4)	8%(6)

Respondent perceived factors that affect compliance to the use of Alderete's score chart

Staff related factors were the leading among the perceived factors affecting compliance on the use of Alderete's score chart 23% (n=16). Among the identified staff related factors were staff lack of knowledge and training on how and when to use the chart this was also evident on the number of respondents who have been trained on Alderete's score chart 15% (n=11). Poor nurse to patients' ratio was also mentioned as factor together with shortage of nurses per shift. The negative attitude of the nurses on the use of the chart also contributed to factors that affected its use. Some respondents 29% (n=20) believed that the use of the chart was time wasting and cumbersome for them. Institutional related factors 60% (n=42) identified by the respondent were lack of the charts 48% (n=29), followed by lack of enough monitors to monitor patients continuously in PACU 29% (n=18). This made it difficult to complete the chart. The institution has also failed to provide the adequate number of staff to improve on the ratio of nurse to patient which ought to be one to one. The average number of patients taken care of by one nurse per shift is estimated at between 6 to 13 patients. As per patient related factors 17% (n=12), the following were identified as the key issues that affected compliance on Alderete's score chart.

Patients' age together with the mode of anesthetic agent used during surgery were identified to affect the use of the chart. In addition, the duration and nature of the surgery could also affect the use of the chart. The number of patients in PACU at any particular time would also affect the use of the chart. Lastly the pain perception of each patient was also viewed as a factor that affected the use of the chart.

Discussion

Staff related factors affecting Alderete's score chart compliance

Professional background of the care provider did not affect the use of Alderete's score chart and most of the nurses were using Alderete's score chart regardless of their professional qualifications. However those with higher professional qualification used the chart more than those with lower professional qualification. This is similar to a study done by Kieft et al. [4] that stated that nurses must gain autonomy of their own experiences and this can be achieved through higher education [4]. Staffs that have the required knowledge and skills will be better placed to use the Alderete's score chart more effectively.

Nurses were utilizing the Alderete's chart yet more than half of them did not understand the components well. The nurses could not use the chart appropriately if they did not understand the components and this could compromise the post anesthesia care being offered.

In regards to use of Alderete's score chart and years of experience, there was no statistical significance. This may be attributed to the fact that the monitoring tool was introduced two years ago yet most nurses had worked in Main Theatres for over two years.

On whether other nursing procedures were affected during completion of Alderete's score chart, majority of the nurses reported that they were not affected. The nurses gave the reason that poor ratio of nurses to patients contributed to this problem when a nurse had so many patients to take care of. A research done on impact of nurses shortage on patient care concluded that shortage of nurses led to stressful hospital environment [5]. This is the same as the finding that the nurses observed shortage to be a factor that affected the delivery of health care.

Concerning suitability of the chart and whether there was need for improvement, many respondents reported that the chart needed some improvement. The parameters that were suggested were noninvasive blood pressure monitoring, assessment of the operation site and digital monitoring of temperature. According to a research done by Fredric Michard post-operative complications are a burden to the economy and there is need to continually improve the monitoring tools [6]. This study is also in line with post-operative remote monitoring that acknowledged need for improvement of equipment [7].

On the association of the use of Alderete's score chart and training on the use of the chart, there was significant statistical evidence that most of the nurses using the tool were most likely to have been trained. Training is important for healthcare providers to embrace the best practices and to continually improve on the services offered to patients [8]. Training on a new tool that has been introduced to improve care is very important to make the staff familiar with the tool and understand the components. It also helps the staff to acquire the basic skills needed to use a certain instrument and puts them at a higher level in terms of knowledge and skills thus helping them in avoiding errors and omissions [9]. This statement agrees with a research carried out to determine the factors that influence the quality of health care service quality by Ali Mohammad whereby he stated that training of staffs is very vital [10].

Nurses utilized Alderete's score chart to monitor post anesthesia patients because it made their work easier avoiding duplication of documenting on the patients' cardexes, observation charts and anesthetic charts. The chart was also simple and easy to complete ensuring efficiency especially when the patients in PACU were many.

Conclusion

Most nurses were utilizing Alderete's score chart to monitor patients post anesthesia even though most of them had not been trained on the monitoring tool. Shortage of nurses and lack of supplies hindered the nurses from effectively utilizing the scoring tool.

Acknowledgement

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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