

## The Effect of Communication of Physicians' Verbal Order Educational Awareness Sessions on Nurses' Knowledge and Safety Attitudes

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**Abstract:** Verbal orders are considered an imperative communication mechanism in healthcare systems among physicians and nurses. Misuse of verbal orders can lead to errors and influence patient safety. The aim of this study was to determine the effect of communication of physicians' verbal order educational awareness sessions on nurses' knowledge and safety attitudes at Damanhour National Medical Institute El-Beheria Governorate. A quasi-experimental, interventional research design was applied with all nurses (N= 70) who are working in the medical and surgical care units at Damanhour National Medical Institute El- Beheria, Egypt. Four tools were used to conduct the current study: Tool I: Verbal Order Knowledge Questionnaire (VOKQ), tool II: Verbal Order Observation checklist (VOOC), tool III: Verbal order Audit sheet (VOAS) and Tool IV: Safety Attitude Questionnaire (SAQ). A demographic characteristics questionnaire was developed. Verbal Order educational Awareness Sessions (VOEASs) were introduced to nurses as the study intervention. Results showed that statistically significant differences were found in the overall percent scores of nurses' knowledge regarding communication of physicians' verbal order along with all entire related dimensions immediately post and post three months from attending VOEASs. Moreover, significant improvements were found in the overall percent scores of nurses' safety attitudes together with all entire related all six dimensions immediately post and post three months from attending VOEASs. Conclusion: Based on the study results, it can be concluded that nurses' had highly statistically significant differences on their knowledge regarding communication of physicians' verbal order and their safety attitudes, between before, immediately post and post three months from attending VOEASs in the medical and surgical care units at Damanhour National Medical Institute El- Beheria, Egypt. Recommendations: Frequent periodic training programs should be implemented for nurses in different healthcare units, to increase their awareness about communication of physicians' verbal orders.

**Key words:** Communication • Physicians • Verbal Orders • Educational Awareness Sessions • Nurses  
• Safety Attitudes

### INTRODUCTION

In recent time, healthcare issues that are related to patient safety have become a global concern [1]. Healthcare organizations have an obligation to protect patient health and healthcare providers, especially the nurses who have a responsibility to do no harm [2]. They have a professional duty to provide a safe care to all patients without the risk of unnecessary harm. Patients have a right to expect that all healthcare providers especially nurses will take all necessary and reasonable precautions and safeguards to keep them safe [2, 3]. Although many patient safety initiatives make possible

improvement, they are often short lived and unsustainable due to many challenges [4]. The most evident challenge is misunderstood communication between nurses and ordering physicians, especially in case of communicating verbal orders [5, 6].

Communication is the use of commonly understood symbols, signs and rules for conveying meanings from one entity or group to another [6]. There are many types of communication and more than one might happen at the same time. In verbal communication, a person listens to another in order to understand the meaning either face to face or through a telephone and other means of voice communication. Written communication can take the form

of letters, E-mail, magazines, or via other media and visualization as graphs and charts. Nonverbal communication includes eye contact, body language and gestures [6, 7]. Open lines of communication especially of verbal orders are crucial between nurses and ordering physicians to ensure that patients are receiving high quality and safe healthcare services [8-10].

Verbal orders have been common, since earlier times, as a method of communication and are used in different healthcare areas, including hospitals, nursing homes, clinics and hospice [11]. These verbal orders can be an order or series of orders during an ordering situation or event (for example, ordering a laboratory investigation, discontinuing or modifying current medication or adding a new medication) and may cover all types of orders (e.g., diagnostic or therapeutic procedures, healthcare counseling, medications and other interventions) [12]. If the orders are received by a competent authorized person, then the decision will be timely and more reliable and it will accelerate the effort as if they are appropriately documented and signed, these orders become legal [11-13].

The most significant issue is that, essentially, these types of orders have error probability. The factors that cause the error in the verbal orders include: fatigue of ordering physician or receiving staff nurse, similarity of the names of drugs, noise in the work environment, pronunciations of the drug name by the physician, spelling differences, unfamiliarity with patient and drug condition and unaccustomed terms [12, 13]. Therefore, The Joint Commission for the Accreditation of Healthcare Organizations [14] confirmed that the use of verbal orders certainly cannot be banned or excluded, but its use can be minimized and used only during urgent lifesaving circumstances when it is not possible or there is no sufficient time, to write the order, or to enter information into the computer.

The immense majority of the verbal-order literature has confirmed the need to develop and standardize policies and procedures that help to ensure the accuracy of verbal-order communication [9]. This is due to the possibility for verbal orders to be miscommunicated or misunderstood. Therefore, JCAHO [14] recommended that whenever verbal orders are taken, nurses who receive the orders should first write out the orders and then read them back to the ordering physician [14, 15]. Nurses' knowledge regarding verbal orders communication includes three essential elements: Verbal order as an important communication method either face to face or through a telephone and other means

of voice communication, nurse-physician communication as an integral part of transferring patient care knowledge in the health care environment and patient safety as a freedom from accidental or preventable injuries that are produced by health care providers [9, 11, 14, 15].

Moreover, recommendations have been proposed by various healthcare organizations and authorities to diminish errors and safety threats which are related to the issuing of verbal orders [16]. The most commonly recommended method to reduce verbal order errors and increase the validity and reliability of documentation processes, is the write down- read back method. All orders must be recorded and registered by nurses who receive the order and then they should request the ordering physician to repeat the order again. The physician should also repeat it appropriately to the receiving staff nurse. Additionally, the receiving nurse should announce more complete information about the patient's history, health status and the medications that are consumed. The ordering physician must sign it within the following 48 hours [14-16]. Compliance with verbal order policy and procedures minimize the errors and hazards to patient safety [15, 16].

Patient safety is realized by healthcare organizations as a pressing issue, yet achieving patient safety is hard and challenging. The risks to patients are numerous and diverse as well as the complexity of the healthcare system is massive [17, 18]. The human factors maintain the construction of safety by exceptionally dedicated nurses and physicians. It is obvious that, they form a brilliant asset to any healthcare organization. They may be the champions who push for building safety culture in any healthcare organization [19, 20]. Promotion of safety culture is an evolving concept that emphasizes on preventing medical errors and maintaining patient to be free from preventable or unintentional injuries that are produced by healthcare [20].

Safety culture in any healthcare organization refers to the outcome of connections between attitudes, beliefs, values, skills and behaviors that comply with workplace safety procedures [18]. Nurses' safety attitudes represent their tendency to respond positively or negatively towards safety goals, ideas, plans, procedures and behaviors. Safety attitudes influence nurses' choice of actions and allow them to response to safety challenges as they are essential for an accident free work environment that ensures higher efficiency, best quality and saves budget on cost of accident as well as increases nurses' morale, organizational revenue and reputation [19-21].

Positive safety attitudes motivate nurses and physicians to adopt safe behaviors and facilitate the translation and transformation of these behaviors into daily practices. It can also enhance their ability to raise concerns and worries regarding the safety and the ability of healthcare managers to respond to those concerns [20, 22]. In any healthcare organization, improving verbal order communication by nurses and physicians can be enhanced through increasing their awareness about the importance of compliance with a standardized verbal order communication policy and a reflection of increased awareness on their safety attitudes [20].

Reflection is a very beneficial learning tool for improving values, attitudes and behaviors [23]. It is used in learning of complex topics and extended professional values. Reflection is also, a process and a procedure that begin with looking back on a specific situation, thinking over it with rationales; learning from it and then using the new acquired knowledge to help in the future for dealing with similar situations. Thus, reflection can be used as a learning tool for improving nurses' professional practices as a high-quality patient care, safety attitudes and behaviors [23, 24].

**Significance of the Study:** Verbal orders have been recognized as a risk factor for patient safety. They can increase the possibility of errors when they are combined with the pressure of workload and inexperienced nurses and physicians [8, 10]. Thus, it is necessary for healthcare organizations to develop their policies and standardized procedures for using these orders to diminish errors [14]. If healthcare organizations have no strategies and tactics to be used to guarantee the appropriate use of verbal orders and ensure that: verbal orders are accurately communicated, appropriately understood, firstly documented and subsequently transcribed into the patient file and ultimately carried out as intended, many errors will be expected [12]. Common errors and mistakes in using verbal orders include: incorrect identification of patient's status, naming similarity of more than one patient, making wrong decision, no request for re-explanation and clarification, confusion and/or not read back the verbal order. The receiving staff nurse of verbal orders might make mistakes in the audition, understanding of verbal orders, or misunderstanding of sound- like medication. In addition to the names of drugs, mistakes might occur in dosage or drug usage. Errors can endanger patients' life and threatens their safety and overall organizational survival [12-14].

Patients who admitted to medical and surgical care units usually are chronically ill patients with multi-organ failure or peri-operative patients, so they are in a great need for fast and accurate management of their complaints and problems from different health care providers especially nurses. The researchers observed that nurses needed to call the physicians on phone to inform them about any updates in the patient medical condition and/or health problems. Accordingly, the physicians in medical and surgical care units give orders through telephone or verbally face to face which have a higher probability of errors as these orders sometimes can be misheard, misinterpreted and /or mis-transcribed which can threaten the patient life.

Studies on nurses' communication of physicians' verbal orders and its reflection on nurses' safety attitudes are limited. There are only few studies that considered the exact association. Communication and patient safety have been internationally studied in the literature. In USA, a study was done by Rosenstein and O'Daniel [25] to determine the impact of nurses' disruptive behaviors and communication defects on patient safety. It confirmed that nurses' disruptive behaviors and communication defects were linked with adverse events and threaten patient safety resulting in major medical errors and patient mortality. Another study was done in England by Tjia *et al.* [26] to assess nurse-physician communication in the long-term care setting and the perceived barriers as well as the impact on patient safety.

This study recommended that a combination of nurse and physician behaviors contributes to ineffective communication have important implications for the patient safety and support the development of structured communication interventions in order to improve the quality of nurse-physician communication. There was a consensus that nurses need to be brief and prepared with relevant clinical information when they communicate with physicians and that physicians needed to be more open to listen, thus they can improve patient safety.

In Egypt, a recent study was conducted by Hassan and El-Sayed [27] to improve nurses' handling of telephone orders and investigate its reflection on nurses' safety behavior. They concluded that the improvement of nurses' handling of telephone orders was associated with the enhancement of nurses' safety behavior. Up to the researchers' knowledge, the previous study is the only one that was done in Egypt in order to examine nurses' handling of telephone orders as a method of verbal order and its reflection on their safety attitudes.

There is a lack of in-depth researches and little is known whether the improvement of nurses' knowledge of physicians' verbal orders is associated with improving nurses' safety attitudes or not. Hence, there is a need to carry out this study as an attempt to improve perceived nurses' communication of physicians' verbal orders as a mean to improve their safety attitudes for both patient and healthcare organizations. Also, this research is looking forward to point to areas for further researches that are needed in this area.

**Aim of the Study:** This study aimed to determine the effect of communication of physicians' verbal order educational awareness sessions on nurses' knowledge and safety attitudes in the medical and surgical care units at Damanhour National Medical Institute El- Beheria Governorate.

**Research Hypotheses:** The hypotheses of this study were assumed as follows:

*Hypothesis 1:* Nurses' knowledge is significantly and positively improved after attending communication of physicians' verbal educational awareness sessions in the medical and surgical care units at Damanhour National Medical Institute El- Beheria Governorate.

*Hypothesis 2:* Nurses' safety attitudes are significantly and positively improved after attending communication of physicians' verbal educational awareness sessions in the medical and surgical care units at Damanhour National Medical Institute El- Beheria Governorate.

## MATERIALS AND METHODS

**Research Design:** A quasi-experimental, interventional research design was applied.

**Setting:** The current study was executed in all in-patient medical and surgical care units at Damanhour National Medical Institute (N=11). Medical care units are classified into three units (N=3) as follows: Thalassemia, hematemesis, renal and liver diseases units. Surgical care units are classified into eight units (N=8) as follows: Urology surgery, endoscopy surgery, orthopedic surgery, surgical recovery and A, B, C and D in-patient surgical care units. Damanhour National Medical Institute is equipped with 640 beds. The institute is affiliated to the public organization for teaching hospitals and institutes

in Al-Beheria governorate . It provides wide range of services to all population from Al-Beheria and many other governorates. It includes emergency care, causality, in patient medical and surgical care , Intensive care Unit (I.C.U), one day operations, different types of operations, in addition to all para- medical services.

**Subjects:** All nurses who were working in the previously mentioned settings and who were assigned to provide direct care activities to the patients and are available at the time of data collection were included (N=70) and classified as follows: 40 nurses from medical care units and 30 from surgical care units.

**Study Measurement Tools:** Four tools were used in the current study as follows:

**Tool I: Verbal Order Knowledge Questionnaire (VOKQ):**

This self-administered questionnaire sheet was developed by the researchers based on review of related literature [12, 14, 15, 28, 29] to assess nurses' knowledge of communication of physicians' verbal order before, immediately post and post three months from attending verbal order educational awareness sessions. It consisted of 15 questions classified into three main dimensions as follows: Nurse-physician communication (3 questions), verbal order (6 items) and patient safety (6 items).

The responses' scores ranged from "completely know" (2) to "do not know" (0). Nurses' knowledge was considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60%.

**Tool II: Verbal Order Observation Checklist (VOOC):**

This checklist was developed by the researchers based on review of related literature [12-16]. It was used to assess nurses' performance when receiving verbal order. It consisted of 17 statements such as identifying patient full name, spelling the medication name accurately and writes down- read back the received order...etc.

Each statement was scored (1) if it was done and (0) if not done. The scores of the items were summed-up and the total divided by the number of items, giving a mean score. The performance was considered adequate if the percent score was 80 % or higher and inadequate if less than 80 %. This high score (80 %) is mandatory for guarantee nurses' better performance in communicating physicians' verbal order as recommended by JACHO [14].

**Tool III: Verbal Order Audit Sheet (VOAS):** This sheet was developed by the researchers after review of related literature [10-12, 16]. It aimed to audit the regular order sheets filled out by the nurses receiving the verbal orders to check nurses' documentation of verbal order as written in the patient file. The audit sheet was consisted of 15 items such as writing the order in correct patient file, writing the type of the verbal order, writing date and time of the order, writing doctor name, document "read back-write down completed" next to the transcribed order, writing the name of nurse received and witness on the order...etc.

The auditing items were checked and scored (1) if it were well-documented and (0) if were not documented. The score of the items were summed-up and the total divided by the number of items, giving a mean score. The performance was considered adequate if the percent score was 80 % or more and inadequate if less than 80%. This high score (80%) is mandatory for guarantee nurses' better performance in communicating physicians' verbal order as recommended by JACHO [14].

**Tool IV: Safety Attitude Questionnaire (SAQ):** It was developed by Sexton *et al.* [21] and composed of 60 items and then updated by Kristensen *et al.* [22] to 31 items and adapted by the researchers. It is used to measure nurses' safety attitudes in the hospital. It covers six safety attitude dimensions as follows: Team work Climate (6 items), Safety Climate (7 items), Job Satisfaction (5 items), Stress Recognition (4 items), Perceptions of Management (6 items) and Working Conditions (3 items).

The responses were measured on five-point Likert - scale ranging from 1 to 5 as 1 = strongly disagree and 5 = strongly agree. A reversed score was applied for negative statements. For each dimension of safety attitude, the scores of the items were summed-up and the total was divided by the number of the items, giving a mean score for the dimension. Nurses' attitude was considered positive if the percent score was 50% or more and negative if less than 50%.

In addition, attached sheet was used for collecting nurses' demographic and work-related characteristics including: Gender, age, current working unit, educational qualifications and years of experience in current working unit.

#### **Method:**

- An official permission was obtained from the Dean of Faculty of Nursing, Alexandria and Damanhour University and from the director of Damanhour

National Medical Institute and the head of departments to conduct the current study. Researchers introduced the research purposes to nursing administrators for better cooperation and to motivate nurses to actively participate in the study.

- VOOC and VOAS were developed and used by the researchers in English language. VOKQ and SAQ were translated into Arabic and revised by four bilingual academic professors from the Faculty of Nursing, Alexandria University and three professors from the Faculty of Nursing, Damanhour University to review and test content validity, to give their suggestions and recommendations regarding the tools' contents, the nature of questions, clarity of items. Their comments are taken into consideration for ensuring accuracy and minimizing potential threats to validity of the study.
- Test-retest reliability was done for the three tools (VOKQ, VOOC and VOAS) on 7 nurses from Alexandria Main University Hospital with two weeks interval to investigate the stability of the tools over time, it was found to be reliable ( $r = 0.756, 0.79$  and  $0.893$  respectively). Also, the study tools were examined for reliability by measuring the internal consistency of items using Cronbach's alpha coefficient test. The tools proved to be reliable where  $\alpha = 0.89$  for the tool one (VOKQ),  $0.87$  for tool two (VOOC),  $0.90$  for tool three (VOAS) and  $0.94$  for tool four (SAQ) at a statistical significance level where  $p \leq 0.05$ .
- Pilot study: it was carried out in the study settings, to test the clarity, feasibility and applicability of the study tools, on (10%) of the study subjects ( $N = 7$ ), who were excluded from the study subjects. Accordingly, some modifications were done.
- Subsequently, the study was conducted through three consecutive stages: planning, implementation and evaluation.

**Planning and Preliminary Stage:** The researchers clarified the aim of the study to nurses. The preliminary assessment was planned to assess nurses' needs, knowledge, performance and documentation regarding communication of physicians' verbal order and safety attitudes, by filling the questionnaire sheets at their working units and returned it back to the researchers, who were existing to answer and clarify any questions and prevent knowledge contamination (the four tools for the study).

Afterwards, the VOEASs was organized, as follow: the objectives and content were developed; designing handout was based on the in-depth analysis of data obtained from nurses at the preliminary assessment and based on thorough review of related literature<sup>(12-16)</sup>, instructional media was used, such as: brainstorming, group work, case study and video. The handout was reviewed by the previously mentioned panel experts of academic professors. Consequently, some modifications were done; then, the last handout form was developed. Place and time for the sessions were approved by first-line nurse managers and nurses according to their work schedule and off days to avoid interrupting their work times and patient care.

**Implementation Stage:** Nurses were divided into 10 groups, each group involved seven nurses. Each session took approximately two hours (Total 20 sessions). Each group was provided by two consecutive sessions (total time 4 hours/group) to cover the content.

In the first session, the researchers established the relationship with nurses and then introduced general and specific objectives of verbal order and patient safety, principles of communication of physicians' verbal order and types of verbal order. In the second session, the researchers explained the standardized policy and procedure of communication of physician verbal order, responsibilities of physician and nurse in verbal order and advantages from compliance with verbal order communication policy.

Content of VOEASs was delivered using pertinent and interactive teaching strategies according to the information presented including (Lecture, brainstorming, small group discussion and video presentation). The Handout was disseminated to nurses to increase their awareness. A total of 20 sessions were conducted to cover the medical and surgical care units. VOEASs were provided to nurses in their working unit or in their break time. Most of the sessions were conducted in the morning shift and some sessions were conducted at evening shifts for nurses who were scheduled in rotating shifts. Following every session, structured feedback was made by the researchers with nurses on how to rise their understandings.

**Evaluation Stage:** Data was collected, using study four tools (VOKQ, VOOC, VOAS and SAQ) to determine the effect of communication of physicians' VOEASs on

nurses' knowledge and safety attitudes, at immediately post and post three months from attending VOEASs; compared to pre-implementation. These were delivered among nurses at their working units.

- The time needed for filling the study questionnaires (VOKQ and SAQ) took approximately from 20 to 30 minutes/participants. Each staff nurse was then individually observed by the researchers using the verbal order observation check list. Each checklist was given a code and marked by the working unit. The observation lasted 3-5 minutes according to verbal order duration. Each nurse was observed three times. The researchers used concurrent audit through verbal order audit sheet (VOAS) to check and revise nurses' documentation of verbal order in the patient file. Each verbal order audit took approximately from 5 to 10 minutes/participants. The data collection and the provided intervention took a period of six months starting from the first of March to end of September 2019.

**Ethical Considerations:** The ethical committee of the faculty of Nursing, Alexandria and Damanhour University approved the study protocol. An Informed written consent was obtained from the study subjects after explanation of the aim of the study. Data confidentiality and anonymity of study subjects were assured through assigning a code number for each staff nurse instead of names to protect their privacy. The right to withdraw from the study has been guaranteed at any time. Nurses were assured that data are used only for research purposes and that the study procedures could not induce any actual or potential harm to the participants.

**Data Statistical Analysis:** Data were coded and fed to the statistical package of social science (IBM SPSS), version 22. Frequency and percentages (descriptive statistics) were used for presenting nurses' demographic and work-related characteristics. Arithmetic mean and standard deviation (SD) were used for quantifying the studied variables. The Friedman test (analytical statistics) is used to analyze the significance between the three stages (Pre, immediately post and post three months from VOEASs). Pearson correlation coefficient analysis ( $r$ ) was used to test the significance and strength of the relationship between nurses' knowledge regarding communication of physicians' verbal order and their

safety attitudes. All statistical analysis was done using two tailed tests and alpha error of 0.05. Regarding P value, it was considered that: non-significant (NS) if  $P > 0.05$ , Significant (S) if  $P < 0.05$  and Highly Significant (HS) if  $P < 0.01$ .

## RESULTS

Table 1 illustrates that slightly more than one half of the nurses (54.3 %) were females. An equal Percentage (38.6%) of them is in the age group ranging from 30 - <40 years old. This table also reveals that 57.1% of nurses were working in Medical care units. Slightly more than one-half (55.7%) of them have BScNg while, slightly less than one third (30.0%) of them have Secondary Nursing School Diploma. Regarding the years of experience in the current working unit, 47.1% of nurses had years of experience ranging from 1 - <5 years.

Table 2 indicates that high statistically significant differences were found between pre, immediately post and post three months from attending the VOEASs regarding percent scores of nurses' knowledge dimensions namely: Verbal order and patient safety ( $P < 0.001$ ). Also, statistically significant differences were found between pre, immediately post and post three months from attending the VOEASs regarding nurse-physician communication dimension of nurses' knowledge ( $P < 0.05$ ). Moreover, this table shows that overall nurses' knowledge percent scores were satisfactory, immediately post and post three months from attending VOEASs (78.6 and 75.7%) respectively; compared to 100.0% of them with unsatisfactory knowledge prior to attending VOEASs. There is a significant difference in the overall mean percent scores of nurses' knowledge immediately post and post three months from attending the VOEASs ( $74.67 \pm 12.43$  and  $73.57 \pm 12.69$  consecutively) compared to the mean percent score before ( $34.05 \pm 6.14$ ) where ( $F=607.529$  and  $p < 0.001$ ).

Table (3) exhibits that all nurses had inadequate performance regarding communication of physicians' verbal order (100.0%) before attending VOEASs while, above three quarters of them (78.6 % and 77.1%) had adequate performance when receiving physicians' verbal order immediately post and post three months from attending VOEASs respectively. There is a statistically significant difference in the overall mean percent scores of nurses' performance immediately post and post three

Table 1: Distribution of the studied nurses according to demographic characteristics (N = 70)

Demographic characteristics	No.	%
Gender		
Male	32	45.7
Female	38	54.3
Age (years)		
<30	27	38.6
30 - <40	27	38.6
40 - 50	16	22.8
Mean $\pm$ SD.	33.43 $\pm$ 8.65	
Current Working Unit		
Medical Care Units	40	57.1
Surgical Care Units	30	42.9
Educational Qualifications		
Bachelor of Science in Nursing (BScNg)	39	55.7
Diploma Technical Nursing Institute	10	14.3
Secondary Nursing School Diploma	21	30.0
Years of Experience in the Current Working Unit		
1 - <5	33	47.1
5 - <10	27	38.6
10 - <15	10	14.3

months from attending VOEASs ( $81.60 \pm 25.06$  and  $81.35 \pm 25.08$ ) respectively compared to the mean percent scores ( $30.08 \pm 7.46$ ) before attending the VOEASs where ( $F=297.980$  and  $p < 0.001$ ).

Table (4) shows that all nurses had inadequate documentation of physicians' verbal order in the patient file (100.0%) before attending VOEASs while, after the VOEASs above three quarters of them (78.6 and 75.7 %) had adequate documentation when receiving physicians' verbal order immediately post and post three months from attending VOEASs, respectively. Statistically significant differences were found in the overall mean percent scores of nurses' documentation immediately post and post three months from attending VOEASs ( $88.09 \pm 17.17$  and  $87.05 \pm 18.05$ ) respectively, compared to the mean percent score before ( $54.67 \pm 5.28$ ) where ( $F=202.883$  and  $p < 0.001$ ).

Table 5 clarifies that high statistically significant differences were found between pre, immediately post and post three months from attending the VOEASs regarding percent scores of nurses' safety attitudes dimensions namely: Team work climate, safety climate, job satisfaction, stress recognition, perception of management ( $p < 0.001$ ). Also, statistically significant differences were found between pre, immediately post and post three months from attending the VOEASs regarding percent scores of working condition dimension of nurses' safety attitudes ( $p < 0.05$ ). In addition, this table, presents significant differences in the overall mean percent scores

Table 2: Percent scores and mean percent scores distribution of the studied nurses regarding communication of physicians' verbal order knowledge, at pre, immediately post and post three months from attending verbal order educational awareness sessions (N = 70)

	Pre		Immediate Post		Post three months		Fr	P
	No.	%	No.	%	No.	%		
Nurses' knowledge regarding communication of physicians' verbal order								
Nurse-physician Communication								
Unsatisfactory knowledge	6	8.6	0	0.0	1	1.4	8.857*	0.012*
Satisfactory knowledge	64	91.4	70	100.0	69	98.6		
Verbal order								
Unsatisfactory knowledge	70	100.0	20	28.6	20	28.6	98.039*	<0.001**
Satisfactory knowledge	0	0.0	50	71.4	50	71.4		
Patient Safety								
Unsatisfactory knowledge	70	100.0	5	7.1	7	10.0	126.123*	<0.001**
Satisfactory knowledge	0	0.0	65	92.9	63	90.0		
Overall knowledge								
Unsatisfactory knowledge	70	100.0	15	21.4	17	24.3	Fr=106.145*	<0.001**
Satisfactory knowledge	0	0.0	55	78.6	53	75.7		
Overall mean Percent score of nurses' perceived knowledge	34.05 ± 6.14		74.67 ± 12.43		73.57 ± 12.69		F=607.529*	<0.001**

Fr: Friedman test

p: p value for association between pre and post

\*: Statistically significant at  $p \leq 0.05$

\*\* : Statistically high significant at  $p \leq 0.001$

Table 3: Percent scores and mean percent scores distribution of the studied nurses' performance observation during communication of physicians' verbal order, at pre, immediately post and post three months from attending verbal order educational awareness sessions (N = 70)

	Pre		Immediate Post		Post three months		Test of Sig.	P
	No.	%	No.	%	No.	%		
Nurses' Performance during Verbal order Process Observation								
Verbal order Process								
Inadequate Performance	70	100.0	15	21.4	16	22.9	Fr=108.036*	<0.001**
Adequate Performance	0	0.0	55	78.6	54	77.1		
Overall mean Percent score	30.08 ± 7.46		81.60 ± 25.06		81.35 ± 25.08		F=297.980*	<0.001**

Fr: Friedman test

F: F test (ANOVA) with repeated measures

p: p value for association between pre and post

\*\* : Statistically high significant at  $p \leq 0.001$

Table 4: Percent scores and mean percent scores distribution of the studied nurses' documentation of physicians' verbal order as written in the patient file, at pre, immediately post and post three months from attending verbal order educational awareness sessions (N = 70)

	Pre		Immediate Post		Post three months		Test of Sig.	P
	No.	%	No.	%	No.	%		
Verbal order Documentation								
Verbal audit								
Inadequate Documentation	70	100.0	15	21.4	17	24.3	Fr=106.145*	<0.001**
Adequate Documentation	0	0.0	55	78.6	53	75.7		
Percent score	54.67 ± 5.28		88.09 ± 17.17		87.05 ± 18.05		F=202.883*	<0.001**

Fr: Friedman test

F: F test (ANOVA) with repeated measures

p: p value for association between pre and post

\*\* : Statistically high significant at  $p \leq 0.001$

Table 5: Percent scores and mean percent scores distribution of the studied nurses' safety attitudes, at pre, immediately post and post three months from attending verbal order educational awareness sessions (N= 70)

Safety Attitude Dimensions	Pre		Immediate Post		Post three Months		Fr	P
	No.	%	No.	%	No.	%		
Teamwork climate								
Negative (<50%)	26	37.1	10	14.3	12	17.1	26.824*	<0.001**
Positive (≥50%)	44	62.9	60	85.7	58	82.9		
Safety climate								
Negative (<50%)	20	28.6	0	0.0	1	1.4	36.286*	<0.001**
Positive (≥50%)	50	71.4	70	100.0	69	98.6		
Job satisfaction								
Negative (<50%)	44	62.9	26	37.1	25	35.7	36.105*	<0.001**
Positive (≥50%)	26	37.1	44	62.9	45	64.3		
Stress recognition								
Negative (<50%)	70	100.0	33	47.1	32	45.7	74.053*	<0.001**
Positive (≥50%)	0	0.0	37	52.9	38	54.3		
Perception of management								
Negative (<50%)	38	54.3	20	28.6	18	25.7	36.400*	<0.001**
Positive (≥50%)	32	45.7	50	71.4	52	74.3		
Working conditions								
Negative (<50%)	22	31.4	16	22.9	17	24.3	10.333*	0.006*
Positive (≥50%)	48	68.6	54	77.1	53	75.7		
Overall Percent score								
Negative (<50%)	60	85.7	10	14.3	11	15.7	Fr=98.040*	<0.001**
Positive (≥50%)	10	14.3	60	85.7	59	84.3		
Overall mean Percent score	42.27 ± 6.62		60.11 ± 7.32		59.96 ± 7.46		F=507.783*	<0.001**

Fr: Friedman test

p: p value for association between pre and post

\*: Statistically significant at  $p \leq 0.05$

\*\*: Statistically high significant at  $p \leq 0.001$

Table 6: Correlation between Nurses' knowledge, Performance, Documentation of Physicians' Verbal order and safety attitudes, at pre, immediately post and post three months from attending verbal order educational awareness sessions (N = 70)

	Nurses' Knowledge about communication of Physicians' Verbal order	Nurses' Performance during Verbal order Process Observation	Verbal Order audit (Documentation)	Safety Attitude
Nurses' Knowledge about communication of Physicians' Verbal order	r			
	p			
Nurses' Performance during Verbal order Process Observation	r	0.568*		
	p	<0.001**		
Verbal order Audit (Documentation)	r	0.528*	0.902*	
	p	<0.001**	<0.001**	
Safety Attitude	r	0.623*	0.774*	0.778*
	p	<0.001**	<0.001**	<0.001**

r: Pearson coefficient

p: p value for association between pre and post

\*: Statistically significant at  $p \leq 0.05$

\*\*: Statistically high significant at  $p \leq 0.001$

r = Pearson coefficient value: weak from 0.0 to 0.25- moderate from > 0.25 to 0.5- strong from > 0.5 to 1.00

of nurses' safety attitudes immediately post and post three months from attending the VOEASs (60.11 ± 7.32 and 59.96 ± 7.46) respectively, compared to the mean percent score before (42.27 ± 6.62) where  $F = 507.783$  and  $p < 0.001$ . Significant improvements were also, found in the overall nurses' safety attitudes. The majority of

nurses (85.7 %) reported having negative attitudes toward safety before attending VOASs while the majority of them (85.7 % and 84.3%) reported that they gain positive attitudes toward safety immediately post and post three months from attending the VOEASs, respectively ( $p < 0.001$ ).

As evident in Table 6, strong high positive significant correlations were found between total nurses' knowledge about communication of physicians' verbal order, nurses' performance during verbal order process observation, verbal order documentation and nurses' safety attitudes ( $r > 0.5$  to  $1.00$  and  $p < 0.001$ ).

## DISCUSSION

Providing appropriate and safe health care is tremendously important to patients' health. Presently, a wide range of safety issues have challenged the healthcare delivery and therefore, numerous personal and organizational strategies have been developed for promoting patient safety [2]. All health care providers especially, nurses have an obligation to do no injury or harm as well as health care organizations have an obligation to protect human health. Effective communication of physicians' verbal orders by nurses is essential for maintaining safe patient care and improving quality of health services. Any unintentional error during handling of verbal orders can endanger patient safety [24].

The current study revealed significant improvements in the overall nurses' knowledge regarding communication of physicians' verbal order along with the entire related dimensions. More than three quarters of nurses reported that they have satisfactory knowledge regarding communication of physicians' verbal order at immediately post and post three months from attending VOEASs. This finding can be attributed to the information which nurses had during the VOEASs and the high interest of them to gain knowledge about the study topic as they reported that it is very important for them to understand the ideal verbal order policy to protect them from legal aspect. Also, this can be happen as a result of nurses' willingness and enthusiasm to gain more information about accurate communication of physicians' verbal order for maintaining nurses' legal defense.

This result is in congruence with Ahmed *et al.* [30] who highlighted the positive effect of the information that is gained during training and orientation program on the improvement of the study subjects' knowledge and perception regarding handling of physicians' verbal orders. Moreover, this result goes in line with Kiyancicek *et al.* [31] who assured that the importance of health care professionals' education has to be emphasized in order to gain information, ability and attitude for safe patient care. Similar success of training intervention in improving nurses' knowledge was reported by Tronchin *et al.* [32] and Sauter *et al.* [33].

Additionally, the results of this study revealed that statistically significant differences were found in the overall mean percent score of observing nurses' performance and auditing the nurses' documentation of physicians' verbal order in the patient file immediately post and post three months from attending VOEASs. This obvious improvement in nurses' performance and documentation of physicians' verbal order can be attributed to the knowledge that they acquainted during the VOEASs about the ideal steps and method to communicate and document physicians' verbal orders effectively.

This speculation goes in the same line with what nurses reported regarding the researchers' effective roles in clarifying and explaining the significance of the topic very effectively. This finding is in agreement with Chegg [34] who ascertained the ideal elements in communicating verbal orders to eliminate errors as it should only be used in emergency situations and shall only be documented by the assigned nurse who should repeat the order to the doctor in the presence of a witness nurse to ensure that the details are correct and nurses who are educated frequently about these elements exhibits improved performance in communication of physicians' verbal order.

In this instance, JCAHO [14] confirms supervision and frequent awareness that the use of verbal orders certainly cannot be excluded, but its use can be minimized and used only during urgent lifesaving circumstances or when it is not possible or there is no sufficient time, to write the order, or to enter information into the computer. The immense majority of the verbal-order literature has confirmed the need to orient and train nurses about the effective communication of physicians' verbal order. This is due to the possibility for verbal orders to be miscommunicated or misunderstood. In this respect, JCAHO [14] recommended that whenever verbal orders are taken, nurses who receive the orders should first write down the orders and then read them back to the ordering physician [14, 15]. In such regard, Vaismoradi *et al.* [9] recommended to develop and standardize policies and procedures that help to ensure the accuracy of verbal-order communication with frequent education and training regarding these procedures.

Furthermore, the present study clarified that significant differences were found in the overall mean percent score of nurses' safety attitudes immediately post and post three months from attending VOEASs. Significant improvements were found in the overall nurses' safety attitudes together with the entire related all six dimensions. This improvement in the nurses' safety

attitude can be attributed to the awareness that they gained and the concern about patient safety behaviors which inspire them to practice safe nursing care. In addition, this improvement in nurses' attitudes immediately post and post three months from attending VOEASs can be attributed to the intensification in nurses' knowledge which is associated with the modification in their understanding, performance, documentation and overall perception of effective communication of physicians' verbal orders.

Moreover, Damanhour National Medical Institute retains and provides frequent training programs and courses about patient safety that are related to processes and procedures through assigned performance improvement team. Thus, nurses were very motivated and encouraged to practice safely. Likewise, Schwendimann *et al.* [35], Bondevik *et al.* [36] and Brasaite *et al.* [37] demonstrated the effectiveness of safety campaign in enhancing safety behaviors and culture in front line nurses and organization. Similarly, Alshammari *et al.* [38] confirmed that practical training program that was related to patient safety can enhance safety culture and attitude for all healthcare providers especially nurses.

In addition, the results of this study illustrated that strong high positive significant correlations were found between total nurses' knowledge about communication of physicians' verbal order, nurses' performance during verbal order process observation, verbal order documentation and nurses' safety attitudes. This correlation was confirmed by Kiyancicek *et al.* [31] who emphasized the implication of educational training programs on nurses' knowledge, the performance level and work outcomes, with documentation of verbal order and the reflection on nurses' safety attitudes.

## CONCLUSIONS

In summary, based on the study results, it can be concluded that nurses' educational awareness sessions about communication of physicians' verbal orders had highly statistically significant differences on their knowledge and attitudes, between before, immediately post and post three months from attending the sessions in the medical and surgical care units at Damanhour National Medical Institute El- Beheria, Egypt.

**Recommendations:** Based on the study findings, the following recommendations were proposed:

### Hospital Administrative Authorities Should:

- Develop a standardized written policy about safe nurses' communication of Physicians' verbal order.
- Conduct periodic training programs for all nurses to extend their awareness about standardized policy for communicating physicians' verbal order and its reflection on patient safety.
- Reward nurses' adherence to verbal orders' safe practice and provide incentives to the best performers.
- Provide in-service training for nurses to be acquainted with necessary skills to perform their work safely.
- Supervise continually and monitor the ideal implementation and nurses' compliance with the developed verbal order policy.
- Maintain a non-punitive and no-blame culture in the work environment to encourage reporting of unsafe incidents or practices.
- Include nurses' adoption of safety behaviors in performance appraisal system.

### Strengths, Limitations and Implications for Future Research:

The study contributes to improving nurses' communication of physicians' verbal orders and also, to investigate its reflection on nurses' safety attitudes. This will shed light for nursing managers and policy makers about the importance of developing a standardized policy for nurses' communication of physicians' verbal orders. However, several limitations exist in this study. First, the main limitation was prolonged time for data collection through the observation and audit because it depends on the occurrence of verbal order. Sometimes verbal orders did not occur during the full shift. Second, generalization is limited as the study was done only with nurses from one hospital. Third, the present study assessed only nurses' communication of physicians' verbal orders as an independent variable on their safety attitudes. Other variables that can affect their safety attitudes can be measured in future researches.

### Future Researches:

- Replication of this study in a wider context of multiple hospitals to provide comparative design and facilitate generalization of the study findings.
- Measuring patient safety incident reports related to nurses' miscommunication of physician orders.

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