



Original Research Article

Effectiveness of Valsalva maneuver on Pain during Venipuncture

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ABSTRACT

Introduction: Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. In hospital settings, IV cannulation is the most common invasive procedure causing pain.

Aim: The present study aimed to assess the effectiveness of Valsalva Maneuver on pain during venipuncture among patients in tertiary care hospital. Conceptual framework for the study was adopted from Ludwig Von Bertalanffy (1968).

Materials and Methods: Quasi-experimental with post test only control group design was used. Sixty subjects who had been planned to have IV cannulation were included in the study. Through convenient sampling with random assignment, 30 subjects were selected in experimental and in control group, each. Subjects in experimental had done Valsalva Maneuver during venipuncture. The socio-demographic and clinical data of the patient was collected through interview schedule. The standardized Numeric Pain Rating Scale was used to assess the level of pain during venipuncture in both groups. Descriptive statistics, independent t-test, chi square and ANOVA were used to analyze the data.

Results: The results revealed that there is significant reduction in pain during venipuncture after intervention in experimental group with ($p=0.000$). No association was found between pain level and socio-demographic and clinical variables.

Conclusion: Valsalva Maneuver is non invasive, non-pharmacological and effective method to reduce pain associated with peripheral intravenous cannulation. Nurses should practice Valsalva Maneuver for patients undergoing venipuncture. Hospital authorities should incorporate in-service education programmes for nurses, students to promote the non-pharmacological method for pain relief during IV cannulation.

Keywords: Pain, Peripheral intravenous cannulation, Valsalva Maneuver

INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It motivates the individual to draw from damaging situations and to avoid similar experience in future. [1] In hospital settings patient experiences pain

due to different causes like stitches, blood drawn, lumbar puncture. [2]

Peripheral intravenous cannulation is one of the most common invasive procedures carried out in the hospital. Peripheral venous cannulation is mandatory for patients requiring intravenous drugs / fluids to be administered or for emergency

venous access. Patient anxiety and fear concerning needles may even prevent them from seeking health care. [3]

Pain can be managed by using both pharmacological like analgesic or non-pharmacological methods like diversional therapy, music therapy, Valsalva Maneuver. Among them the Valsalva Maneuver is most commonly used for pain reduction. [3]

This technique is named after Antonio Maria Valsalva, [3] a 17th-century physician and anatomist from Bologna. The Valsalva Maneuver is performed by moderately forceful attempted exhalation against a closed airway, usually done by closing one's mouth, pinching one's nose shut while pressing out as if blowing up a balloon.

In 1965, Malzeck and Wall published the well known 'Gate Control Theory of Pain'. According to this theory, a mechanism in the brain acts as a gate to increase or decrease the flow of nerve impulses from the peripheral fibres to the central nervous system. An 'open' gate allows the nerve impulses and the brain can perceive pain. A closed gate does not allow the nerve impulses, decreasing the perception of pain. Although the gate control theory has been widely accepted since the 1970, it leaves unanswered questions including chronic pain issues, sex based differences, stress effects and the effect of previous pain experiences. [3]

During Valsalva Maneuver contraction of thoracic cage compresses lungs and cause increase in intrathoracic pressure resulting in compression of vessels within the chest and in turn baroreceptor activation. The activation of the cardio pulmonary baroreceptor reflex induces antinociception. [3] Cardiopulmonary (CP) baroreceptors have thought to modulate baroreflex control of sympathetic nerve activity. Due to loading of CP baroreceptors due to increase intrathoracic pressure causes

modulation of baroreflex control sympathetic nerve activity and it causes antinociception. [4] The efficacy of Valsalva Maneuver on needle projection pain has been reported in various studies. [5-7]

Cannulation is a common procedure done by nurses. To reduce pain during cannulation, Valsalva Maneuver is easy to perform and is cost effective method. [3]

There is need to enforce some kind of non-pharmacological therapy like Valsalva Maneuver to reduce the pain during venipuncture in the patients admitted in the hospital. Hence, the researcher selected this problem to address. The main objectives of this study were to assess the effect of Valsalva Maneuver on pain during venipuncture and to find the association of pain with selected socio-demographic and clinical variables.

METHODOLOGY

A quasi- experimental study with quantitative approach was done to assess the effect of Valsalva Maneuver on pain during venipuncture and to find the association of pain with selected socio-demographic and clinical variables. The present study was conducted at two medicine wards of Guru Gobind Singh Medical Hospital, Faridkot. The population for the study was 60 patients who were admitted in the medicine wards and were conveniently selected at Guru Gobind Singh Medical Hospital, Faridkot. The group included only those patients who planned to have IV cannulation and were willing to participate in the study. The patient who had cardiovascular, neurological and respiratory problems was excluded from the study. After the selection of study subjects, identification profile of the patients was filled in the record performa. Total two measures were used to collect data from the subjects

Tool 1(A): Socio-Demographic Datasheet: It was developed by researchers which

consist of total 8 items to measure demographic data of the subjects. These items were age, gender, educational status, occupation, income of family per month (Rs), marital status, religion, place of residence. The data was collected using interview schedule. Content validity of tool was determined by experts in the field of medicine and medical surgical nursing respectively. Content appropriateness, clarity and relevance were ascertained by language expert. Reliability of the tool was determined by test retest method and it was found to be $r = 1$.

Tool 1(B): Clinical Datasheet: It was developed by researcher which consists of total 7 items to measure clinical data of the subjects. These items were site of cannulation, size of cannula, number of attempted cannulation, previous cannulation, number of previous cannulation during admission, previous experience to cannulation, diagnosis. The data was collected using interview schedule. Content validity of tool was determined by experts in the field of medicine and medical surgical nursing respectively. Content appropriateness, clarity and relevance were ascertained by language expert. Reliability of the tool was determined by test retest method and it was found to be $r = 1$.

Tool 2: Numeric Pain Rating Scale: [8] The Numeric Pain Rating Scale (NPRS-11) is an 11-point scale for patient self-reporting of pain level. It is used for adults and children of 10 years old or older. It is classified according to scores with no pain score is 0, mild pain score is 1-3, moderate pain score is 4-6 and severe pain score is 7-10. In this the patient was asked to choose a number from 0 to 10 in the scale during venipuncture that best describes their current pain level in which 0 means no pain and 10 worst possible pain. The higher the score the greater the pain level. Reliability of the scale was determined by inter-rater reliability

method which was 0.93. The NPRS scale is used in several studies where it is used to measure the level of pain in different procedures. [9-14]

Try out of the tools and intervention was to ensure the reliability and understanding of the tool. Pilot study was conducted in medicine wards of Guru Gobind Singh Medical Hospital, Faridkot to find feasibility of the study and was found to be feasible. In this patient was asked to perform Valsalva Maneuver by doing moderately forceful exhalation against a closed airway by closing one's mouth shut and do as blowing up a balloon during IV cannulation and pain level is assessed immediately after it by using Numeric Pain Rating Scale ranging from 0-10.

Ethical Considerations: Study approval was taken from ethical committee of the University College of Nursing, Baba Farid University of Health Sciences, Faridkot and written permission was taken to conduct the study from the competent authority of Guru Gobind Singh Medical Hospital, Faridkot. Study procedure was explained and written information was given to the subjects. Informed written consent from the subjects was taken. Participants who were willing to participate were included in the study. Anonymity of study subjects and confidentiality was maintained.

Statistical Analysis: Statistical analysis was done by using SPSS (16) software. The descriptive statistics (percentage, mean, standard deviation) and in inferential statistics (independent t test, chi square, ANOVA test) was used for statistical analysis. The t-test, chi square and ANOVA were used to assess the effect of Valsalva Maneuver on pain during venipuncture and to find association of pain with selected socio-demographic and clinical variables. The p value at <0.05 was considered is statistically significant.

RESULTS

Table 1: Baseline comparison of experimental and control group with regard to socio-demographic variables (N=60)

Table 1:- Baseline comparison of experimental and control group with regard to socio-demographic variables (N=60)

| Variables | Exp. F (%) | Cont. f (%) | χ^2 /df | p |
|-----------------------------|------------|-------------|--------------|-------|
| Age (in years) | | | | |
| <20 years | 3 (5) | 4 (6.67) | 0.33 | 0.954 |
| 21-40 years | 11(18.3) | 12 (20) | df = 3 | NS |
| 41-60 years | 10 (16.6) | 9 (15) | | |
| >60 years | 6 (10) | 5 (8.3) | | |
| Gender | | | | |
| Male | 16 (26.7) | 17 (28.3) | 0.67 | 0.795 |
| Female | 14 (23.3) | 13 (21.7) | df = 1 | NS |
| Educational status | | | | |
| Illiterate | 6 (10) | 5 (8.3) | | |
| Upto primary | 2 (3.3) | 3 (5) | 0.669 | 0.955 |
| Upto secondary | 7 (11.7) | 8 (13.3) | df = 4 | NS |
| Upto higher sec. | 11 (18.3) | 9 (15) | | |
| Grad. and above | 4 (6.7) | 5 (8.3) | | |
| Occupation | | | | |
| Labourer | 11 (18.3) | 10 (16.7) | 0.316 | 0.957 |
| Service | 4 (6.7) | 3 (5) | df = 3 | NS |
| Business | 7 (11.7) | 8 (13.3) | | |
| Any other | 8 (13.3) | 9 (15) | | |
| Income of family(Rs) | | | | |
| Upto 10000 | 15 (25) | 16 (26.7) | | |
| 10001-15000 | 4 (6.7) | 3 (5) | 0.363 | 0.948 |
| 15001-20000 | 6 (10) | 7 (11.7) | df = 3 | NS |
| >20000 | 5 (8.3) | 4 (6.7) | | |
| Marital status | | | | |
| Married | 21 (35) | 22 (36.7) | 1.1 | 0.577 |
| Unmarried | 6 (10) | 7 (11.7) | df = 2 | NS |
| Widow/Widower | 3 (5) | 1 (1.7) | | |
| Divorced/Separated | 0 (0) | 0 (0) | | |
| Religion | | | | |
| Hindu | 7 (11.7) | 10(16.7) | | |
| Muslim | 0 (0) | 1(1.7) | 1.95 | 0.583 |
| Sikh | 21 (35) | 17 (28.3) | df = 3 | NS |
| Christian | 2 (3.3) | 2(3.3) | | |
| Any other | 0 (0) | 0 (0) | | |
| Place of residence | | | | |
| Urban | 7 (11.7) | 6 (10) | 0.98 | 0.754 |
| Rural | 23 (38.3) | 24 (40) | df = 1 | NS |

NS= Non Significant at p value < 0.05

As shown in table 1, in experimental group, maximum number of subjects were in the age group of 21-40 years, males, educated upto higher secondary and labourer. Income of the one fourth of the subjects was upto 10000. Majority of the subjects were married, Sikhs and belongs to rural area. In control group, maximum

number of subjects was in the age group of 21-40 years, males, educated upto higher secondary and labourer. Approximately, income of the one fourth of the subjects was upto 10000. Majority of the subjects were married, Sikhs and belongs to rural area. Both the groups were comparable as per socio-demographic variables as per χ^2 test (p<0.05).

Table 2: Baseline comparison of experimental and control group with regard to clinical variables (N=60)

As shown in table 2, in experimental group, majority of the subjects had cannulation in dorsum of hand, size 22G, cannulation done in first attempt and had previous cannulation. Maximum number of subjects had one previous cannulation during admission, experienced severe pain in previous cannulation and was suffering from renal disorders. In control group, majority of the subjects had cannulation in in first attempt and had previous cannulation. Maximum number of subjects had one previous cannulation during admission. Approximately, one fourth of the subjects experience severe pain in previous cannulation. Both the groups were comparable as per clinical variables as per χ^2 test (p<0.05).

Table 3: Comparison of mean pain score of experimental and control group (N=60)

As shown in table 3, in experimental group, the mean±SD is 2.8±1.2 and in control group it was 7±1.8. As per t test, there is highly significant difference (t =10.69, p = 58) in pain level in experimental and control group at p value <0.01.

Hence, it can be concluded that Valsalva Maneuver is effective in reduction of pain during venipuncture in experimental group subjects.

Table 2:- Baseline comparison of experimental and control group with regard to selected clinical variables (N=60)

| Variables | Exp. Group f(%) | Cont. group f(%) | χ^2 / df | P |
|--|--------------------|---------------------|-----------------|-------------|
| Site of cannulation | | | | |
| Dorsum of hand | 18 (30) | 19 (31.7) | 0.753 df = 2 | 0.686 NS |
| Inner aspect of forearm | 8 (13.3) | 9 (15) | | |
| Outer aspect of forearm | 4 (6.7) | 2 (3.3) | | |
| Any other | 0 (0) | 0 (0) | | |
| Size of cannula | | | | |
| 20 G | 1(1.7) | 2 (3.3) | 1.352 df = 2 | 0.509 NS |
| 22 G | 26 (43.3) | 27 (45) | | |
| 24 G | 3 (5) | 1 (1.7) | | |
| Number of attempted cannulation | | | | |
| First | 23 (38.3) | 25 (41.7) | 0.417 df = 1 | 0.519 NS |
| Second | 7 (11.7) | 5 (8.3) | | |
| More than two | 0 (0) | 0 (0) | | |
| Previous cannulation | | | | |
| Yes | 21 (35) | 22 (36.7) | 0.82 df = 1 | 0.774 NS |
| No | 9 (15) | 8 (13.3) | | |
| Number of previous cannulation during admission | | | | |
| Nil | 7 (11.7) | 8 (13.3) | 2.977 df = 3 | 0.395 NS |
| Once | 17 (28.3) | 20 (33.3) | | |
| Twice | 4 (6.7) | 2 (3.3) | | |
| More than two times | 2 (3.3) | 0 (0) | | |
| Previous experience to cannulation | | | | |
| Mild pain | 4(6.7) | 2(3.3) | 1.085 df= 3 | 0.781 NS |
| Moderate pain | 6(10) | 6(10) | | |
| Severe pain | 11(18.3) | 14(23.3) | | |
| No previous exp. | 9(15) | 8(13.3) | | |

NS= Non Significant at p value < 0.05

Table 3:- Comparison of mean pain score of experimental and control group (N=60)

| Attribute under study | Mean(SD) | T | df | P |
|------------------------------|----------|-------|----|----------|
| Experimental group (n=30) | 2.8(1.2) | 10.69 | 58 | 0.000*** |
| Control group (n=30) | 7(1.8) | | | |

***Significant at p value < 0.01

Table 4: Association of pain during venipuncture with socio-demographic variables in experimental and control group (N=60)

As shown in table 4, there was no significant association of pain during venipuncture with age, gender, educational status, occupation, income of family per month, marital status, religion and place of residence in experimental and control group.

Figure 1: Distribution of sample according to the level of pain in experimental and control group (N=60)

In experimental group, none of the subject experienced severe pain, whereas

only approximately three fourth of the subjects (73.3%) experience mild pain. In control group, approximately two third of the subjects (70%) experienced severe pain and only (6.67%) subjects experienced mild pain.

So, it can be concluded that subjects experience less pain in experimental group as compared to control group.

Table 5: Association of pain during venipuncture with clinical variables in experimental and control group (N=60)

As shown in table 5, there was no significant association of pain during venipuncture with site of cannulation, size of cannula, number of attempted cannulation, previous cannulation, number of previous cannulation during admission and previous experience to cannulation in experimental and control group.

Table 4:- Association of pain during venipuncture with selected socio-demographic variables in experimental and control group (N=60)

| Variable | Pain | | | | | |
|--|--------------|---------|-------|----------|---------|-------|
| | Experimental | | | Control | | |
| | Mean(SD) | F/t | p | Mean(SD) | F/t | P |
| Age | | | | | | |
| <20 years | 2.7(2.0) | F=0.057 | 0.98 | 6.5(1.9) | F=0.166 | 0.91 |
| 21-40 years | 2.8(0.9) | df=3 | NS | 7(1.8) | df=3 | NS |
| 41-60 years | 2.8(1.3) | | | 7.2(1.6) | | |
| >60 years | 3(1.3) | | | 6.8(2.3) | | |
| Gender | | | | | | |
| Male | 2.8(1.2) | t=0.4 | 0.68 | 7.1(1.9) | t=0.4 | 0.68 |
| Female | 2.9(1.1) | df=28 | NS | 6.8(1.6) | df=28 | NS |
| Educational status | | | | | | |
| Illiterate | 3.1(1.5) | | | 5.8(1.9) | | |
| Upto primary | 3.0(1.4) | F=0.219 | 0.92 | 6.7(2.5) | F=1.42 | 0.25 |
| Upto secondary | 2.7(0.9) | df=4 | NS | 6.8(1.3) | df=4 | NS |
| Upto higher secondary | 2.6(1.4) | | | 8(1.3) | | |
| Graduation and above | 3(0.8) | | | 7(2.3) | | |
| Occupation | | | | | | |
| Labourer | 3(1.3) | | | 6.6(1.8) | | |
| Service | 3.6(0.5) | F=1.848 | 0.163 | 6.3(1.5) | F=0.538 | 0.66 |
| Business | 2.1(0.9) | df=3 | NS | 7.5(2.3) | df=3 | NS |
| Any other | 2.7(1.3) | | | 7.2(1.4) | | |
| Income of family per month (Rs) | | | | | | |
| Upto 10000 | 2.9(1.4) | | | 6.8(1.7) | | |
| 10001-15000 | 2.3(1.3) | F=0.9 | 0.454 | 7.3(2.0) | F=0.321 | 0.81 |
| 15001-20000 | 2.5(1.0) | df=3 | NS | 6.8(1.9) | df=3 | NS |
| >20000 | 3.4(0.5) | | | 7.7(1.9) | | |
| Marital status | | | | | | |
| Married | 2.9(1.1) | | | 6.9(1.9) | | |
| Unmarried | 2.3(1.5) | F=0.663 | 0.523 | 7.2(1.7) | F=0.111 | 0.895 |
| Widow/Widower | 3(1.0) | df=2 | NS | 7(0) | df=2 | |
| Divorced/Separated | 0(0) | | | 0(0) | | |
| Religion | | | | | | |
| Hindu | 2.53(1.3) | | | 7.6(1.3) | | |
| Muslim | 0(0) | F=0.345 | 0.712 | 9(0) | F=1.5 | 0.238 |
| Sikh | 2.9(1.2) | df=2 | NS | 6.7(1.8) | df=3 | NS |
| Christian | 2.5(0.7) | | | 5.5(3.5) | | |
| Any other | 0(0) | | | 0(0) | | |
| Place of residence | | | | | | |
| Urban | 2.84(1.3) | t=0.6 | 0.953 | 7.3(2.3) | t=0.506 | 0.617 |
| Rural | 2.8(1.2) | df=28 | NS | 6.9(1.7) | df=28 | NS |

NS= Non Significant at p value < 0.05

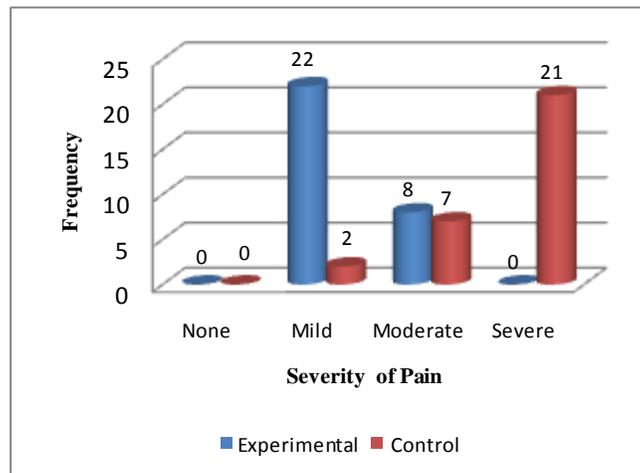


Figure 1:- Bar graph showing distribution of sample according to the level of pain in experimental and control group

Table 5 :- Association of pain during venipuncture with selected clinical variables in experimental and control group (N=60)

| Variable | Pain | | | | | |
|--|--------------|---------|-------|----------|---------|-------|
| | Experimental | | | Control | | |
| | Mean(SD) | F/t | p | Mean(SD) | F/t | P |
| Site of cannulation | | | | | | |
| Dorsum of hand | 2.4(1.0) | | | 6.6(1.8) | | |
| Inner aspect of forearm | 3.3(0.7) | F=2.77 | 0.08 | 7.4(1.6) | F=0.887 | 0.424 |
| Outer aspect of forearm | 3.5(1.7) | df=2 | NS | 8(1.4) | df=2 | NS |
| Any other | 0(0) | | | 0(0) | | |
| Size of cannula | | | | | | |
| 20 G | 4.0(0) | F=0.542 | 0.588 | 8(1.4) | F=0.942 | 0.402 |
| 22 G | 2.7(1.2) | df=2 | NS | 7(1.8) | df=2 | NS |
| 24 G | 3(1.0) | | | 5(0) | | |
| Number of attempted cannulation | | | | | | |
| First | 2.7(0.9) | | | 7(1.8) | | |
| Second | 3(1.7) | t=0.422 | 0.676 | 6.6(1.5) | t=0.543 | 0.591 |
| More than two times | 0(0) | df=28 | NS | 0(0) | df=28 | NS |
| Previous cannulation | | | | | | |
| Yes | 2.7(1.3) | t=0.5 | 0.62 | 6.8(1.9) | t=0.689 | 0.496 |
| No | 3(0.8) | df=28 | NS | 7.3(1.2) | df=28 | NS |
| Number of previous cannulation during admission | | | | | | |
| Nil | 3(1.2) | | | 6.7(1.9) | | |
| Once | 2.5(1.2) | F=0.984 | 0.387 | 7.2(1.5) | F=0.984 | 0.387 |
| Twice | 3.8(0.5) | df=2 | NS | 5.5(3.5) | df=2 | NS |
| More than two times | 3(0) | | | 0(0) | | |
| Previous experience to cannulation | | | | | | |
| Mild pain | 3.1(1.6) | | | 7(2.8) | | |
| Moderate pain | 3(1.3) | F=0.161 | 0.922 | 6.8(2.4) | F=0.59 | 0.627 |
| Severe pain | 2.6(1) | df=3 | NS | 7.4(1.5) | df=3 | NS |
| No previous experience | 2.9(1.2) | | | 6.3(1.6) | | |

NS= Non Significant at p value < 0.05

DISCUSSION

The present study shows that mean score as per NPRS in interventional group (mean score is 2.833) during cannulation is significantly less than that of control group (mean score is 7). This shows that Valsalva Maneuver is effective in reduction of pain during IV cannulation.

It is supported by the study conducted by Vijay VR et al [3] who reported that Valsalva Maneuver decreases the intensity of pain associated with peripheral intravenous cannulation. Also, it was supported by study conducted by Agarwal et. [15] He reported that incidence of pain during venipuncture in Valsalva group was 72% as compared with 100% in the control and ball group. He concluded that Valsalva Maneuver performed during venous cannulation decreased the incidence and severity of pain associated with venipuncture.

Another study, by Mohammadi SS [7] concluded that Valsalva Maneuver can decrease the skin puncture pain associated with spinal needle projection while observing hemodynamic changes. Basaranoglu G [5] conducted a study to see the effect of Valsalva Maneuver on venipuncture pain and found that Valsalva Maneuver before venous cannulation can be considered as simple and practical method to reduce pain from venous cannulation.

Akdas O [6] to evaluated the effect of Valsalva Maneuver during venipuncture in children and concludes that Valsalva Maneuver is effective in reducing pain during venipuncture.

The probable reason for the effectiveness of Valsalva Maneuver is that it increases intrathoracic pressure which causes activation of baroreceptor in result which causes antinociception and thus relief of pain. The probable reason for the

acceptance of Valsalva Maneuver is that it is simple, non invasive, easy to learn and implement, does not cause any harm or increase the financial burden of the patient, and is nonpharmacological method for pain reduction.

The present study revealed that there is no association of pain with sociodemographic and clinical variables. But in some studies it is found that there is association of various socio-demographic and clinical variables Stefan Lautenbacher et al [16] conducted a study to see the effect of age on perception of pain in younger and older adults. He reports that elderly people experience more pain than younger people. It concludes that there is age related difference in pain perception. Another study conducted by Aziza Hussain et al [17] on effect of gender on pain perception and reported that female patients experience more pain as compared to male patients. Patricia Bijttebier [18] et al evaluated the effect of previous experience on pain during venipuncture in children and concluded that child that have negative past experience causes more pain and who have neutral past experience has no impact on pain perception. A study conducted by Vani Mathur et al [19] to see the effect of racial bias on the perception of pain and she reported that there is effect of racial difference in perception of pain and response.

Another study conducted by GG Basavana et al [20] concludes that doing venipuncture on the antecubital fossa causes less pain than on any other site. So, it concludes that pain during venipuncture depends on the site of cannulation.

The probable reason for no association of the socio-demographic and clinical variables in this study is due to small study sample (60 patients), single setting was used and subjects who had

cardiovascular, respiratory and neurological problem are excluded from the study.

IMPLICATIONS AND

RECOMMENDATIONS: Valsalva Maneuver is effective in reducing pain in patients undergoing IV cannulation so it should be incorporated in the training of health care personnel as it is safe, cost effective and easy to learn method. Nurse administrator can conduct in- service education and training programme for nurses working at various departments about the use of Valsalva Maneuver. Findings of the study will act as a catalyst to carry out more extensive research in a large sample and in other settings.

The present study was conducted on 60 patients in the medicine wards so similar study could be replicated on large sample to validate and generalize its findings in different settings. The study could be undertaken using different types of non-pharmacological methods for pain relief during venipuncture other than Valsalva Maneuver with more than one intervention.

CONCLUSION

Peripheral intravenous cannulation is one of the most common invasive procedure carried out in the hospital. Patient anxiety and fear concerning pain from needles may prevent them from seeking health care. The administration of Valsalva Maneuver is effective in reducing pain during venipuncture in experimental group, since there were reduced mean pain score after the intervention. There was no significant association between pain level and socio-demographic and clinical variables.

LIMITATIONS: In this convenient sampling was used for random assignment of subjects and single setting was used for data collection.

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Conflicts of interest: None

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