The importance of critical thinking and its contribution to nursing care based on evidence-based practice

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Purpose of the study

✓ practical procedures, practices, standards must be based on valid and relevant results from research

✓ know the latest recommendations, which are taken on the basis of evidence-based practice

✓ critically implement new scientific knowledge into clinical practice

✓ identify effective nursing practice

✓ use appropriate evidence
Peripheral venous catheter (PVC)

- integral part of the treatment of many diseases
- information about peripheral venous catheters are still being developed
Implementation of standardized nursing procedures and care of PVC

- by critical reasoning and decision-making prevent complications
- standards in accordance with EBP
- transform the latest scientific findings into practice
Main purpose of the study

To highlight the importance of the use of critical thinking in nursing practice - implementation and care of PVC and compliance with nursing standards.
Methods and methodology of the study

✓ quantitative research method used – interview in 4 hospitals in Slovakia

✓ questionnaire was distributed to nurses on following wards: surgical, internal, neurological, geriatric, gynecologist and Department of Trauma Surgery

✓ 600 questionnaires were distributed in September - October 2012

✓ the 492 respondents answered the questionnaire, representing 82% return
Standards used in Slovakia

- Standards were established in 90’s
- 2002 standards were introduced as binding standard into clinical practice
- 2012 revived standards that meet criteria EBP were published
- Still some discrepancies between standards and practice were found
- By using questionnaire we were looking on how nurses act in practice
- In our study both match and mismatch were found
Interpretation of results - EDUCATION

<table>
<thead>
<tr>
<th>Research question 1</th>
<th>Highest level of education attained</th>
</tr>
</thead>
<tbody>
<tr>
<td>•Using of standard performance for the implementation of PVC</td>
<td>0.76**</td>
</tr>
<tr>
<td>•Using of standard performance in taking care of PVC</td>
<td>0.69*</td>
</tr>
<tr>
<td>•Work of specially trained personnel in the prevention of catheter infections</td>
<td>0.61*</td>
</tr>
</tbody>
</table>

* Correlation (R) is significant at the 0.05 level ** Correlation (R) is significant at the 0.01 level

✓ 89.63% of nurses in implementation and caring of PVC follows applicable standards
✓ statistically significant relationship was confirmed between the level of education of nurses and nurses using standards
✓ only 22.97% of nurses see the benefits of specially trained personnel in the prevention of catheter infections
✓ taking into consideration education, nurses with higher education support the need for specially trained personnel in the prevention of catheter infections
Interpretation of results – EDUCATION

Selected studies present the following recommendations:

✓ standardization of aseptic care significantly affects the reduction of risk of infection. Implementation and care of PVC by inexperienced staff may increase the risk of PVC colonization and catheter-related bloodstream infections. Specialized "intravenous teams" have shown effectiveness in reducing the occurrence of bloodstream infections (O'Grady et al., 2011).

✓ implementation and care of PVC should be only performed by trained personnel (Category A) (The Joanna Briggs Institute, 2008).

✓ CDC recommends to educate healthcare professionals about the indications for the implementation and care of PVC and to implement control to prevent infection (Category A) (O'Grady et al., 2011).
Interpretation of results – RECORDS and STANDARDS

- in clinical practice when keeping medical records of PVC there is significant difference when record is done by nurses using standards or those that do not use standards

- this fact was confirmed only by low value of the correlation coefficient which may indicate that the nurses may keep medical records inaccurately

<table>
<thead>
<tr>
<th>Research question 2</th>
<th>Using standard performance of PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeping of medical record of implementation of PVC</td>
<td>0.42**</td>
</tr>
<tr>
<td>Keeping of medical record of bandaging of PVC</td>
<td>0.31**</td>
</tr>
<tr>
<td>Keeping of medical record of removing of PVC</td>
<td>0.30**</td>
</tr>
</tbody>
</table>

* Correlation (R) is significant at the 0.05 level ** Correlation (R) is significant at the 0.01 level

Documentation is the basis for quality assessment of care and research purposes.
Important for expertise - prevention and early identification of complications
- legal document
Interpretation of results – HYGIENE

✓ we have also found that following standards does not affect compliance with hygiene, disinfection of hands and the use of protective gloves
✓ analysis shows that these nurses do not attach adequate importance to this factor
✓ there is a possibility that the nurses were not honest in questionnaire and are eluding a necessary hygiene and disinfection in nursing practice

<table>
<thead>
<tr>
<th>Research question 3</th>
<th>Compliance with hygiene, disinfection and use of protective gloves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$x^2$</td>
</tr>
<tr>
<td>Using nursing standards of PVC</td>
<td>24.73</td>
</tr>
</tbody>
</table>

$p$ - Achieved level of significance statistical test $x^2$ - Chi-square test

Selected studies present the following recommendations:
✓ Implement procedures of hygiene and disinfection of hands, with every work with PVC (O'Grady et al., 2011).
Interpretation of results – HYGIENE

Inconsistency was also detected in compliance with aseptic procedures in implementation and caring of PVC:

- careful hygiene and disinfecting of hands 39.63%
- disinfection of the injection site 100.00%
- before implementation of PVC, disinfect the skin of the patient before it withers 33.74%
- after the application of disinfectant don’t touch injection site 35.37%
- always use protective gloves 28.89%
- always use new station wagon or a new plug mandrel to close PVC 33.13%
The selected study presents the following recommendations:

- if aseptic technique is used, palpation of injection sites should no longer be made after disinfection is applied

- use aseptic technique in implementation and care of PVC

- rather use pure than sterile gloves, if after application you don’t come into contact with the skin

- antiseptic should dry out as recommended by the manufacturer prior to implementation of catheter (O'Grady et al., 2011).
Interpretation of results

Further measurement was the length of implementation of PVC:

- 72 hours: 78.86%
- 96 and more hours: 4.47%
- within 24 hours: 3.05%
- within 48 hours: 13.01%
- after each PVC finished, its being removed: 0.61%

Realized study confirmed that most nurses follow the recommended length of implementation of PVC which is maximum of 72 hours.

Selected studies present the following recommendations:

- do not replace PVC in more than 72 hours intervals, unless clinically indicated or recommended (The Joanna Briggs Institute, 2008).

- exchange the catheters at least every 72 to 96 hours. (O'Gray et al., 2011).
Interpretation of results

Studies suggest not to use antibiotic ointment or creams, as there is a potential to promote fungal infections and antimicrobial resistance (O'Gray et al., 2011).
O'Gray et al. (2011) recommends:

✓ assess PVC daily by touch and look through if there is transparent bandage

✓ gauze and opaque bandage should not be removed if the patient has no clinical signs of infection

✓ if the point of implementation is locally painful or there are other symptoms, opaque bandage should be removed and injection site should be checked
Interpretation of results

In the next part of the research, we found that to maintain patency use:

- 52.44% - heparin plug + combi plug
- 36.79% - NaCl solution + combi plug
- 10.77% - mandrel

The effectiveness of NaCl solution while maintaining patency of PVC:

- sufficient effect 80.67%
- more efficient 7.73%

Nurses who stated that they use heparin cap, comply with the standards.
Selected studies present the following recommendations:

 ✓ The use of heparin at 10 U / ml of flushing the PVC had no significant advantage against saline (Radolph et al., 1998).

 ✓ Periodically flush PVC by saline, unless they are used for blood sampling. In this case use as flushing solution diluted heparin (The Joanna Briggs Institute, 2008).
Suggestions and recommendations for modification of standards

**Current standards in Slovakia**

- PVC to retain maximum of 72 hours, even though there are no present complications
- Injection site, use appropriate antiseptic ointment to treat

**Modified standards based on EBP**

- No need to change catheters more than once every 72-96 hours, to reduce the risk of phlebitis
- Injection site treat by antiseptic ointment, do not use antibiotic ointment or cream to the injection site
## Suggestions and recommendations for modification of standards

<table>
<thead>
<tr>
<th>Current standards in Slovakia</th>
<th>Modified standards based on EBP</th>
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<tr>
<td>✓ for closing PVC use heparin cap</td>
<td>✓ flush PVC by saline, unless they are used for blood sampling</td>
</tr>
<tr>
<td>✓ use new bandage based on material used</td>
<td>✓ do not remove gauze and opaque bandages if the patient has no clinical signs of infection</td>
</tr>
</tbody>
</table>
Conclusion

- delegate the implementation and care of PVC to trained and eligible personnel
- implement regular training and re-training of personnel together with regular evaluation of personnel
- comply with all strict aseptic procedures in implementation and caring for PVC
Conclusion

- develop critical thinking among nurses
- apply evidence-based practice into clinical practice
- use the evidence relevant scientific information
- periodically modify nursing standards
- observe and monitor compliance with all the criteria set out in the standards
Conclusion

The current trend requires that the nurse:

- is able to learn the principles of evidence-based practice
- is able to critically evaluate existing standards to know or suggest corrections or redefinition
- is able to apply standards that correspond latest scientific evidence
Slovakia
Greetings from Slovakia to all the nurses and conference participants send from second co author
Thank you for your attention


ZÁKON č. 576/2004 Z.z. o zdravotnej starostlivosti, službách súvisiacich s poskytovaním zdravotnej starostlivosti a o zmene a doplnení niektorých zákonov.

ZAMBORIOVÁ, M. 2012. Bezpečné podávanie intravenózneho liečiva IV. In Sestra. ISSN 1335-9444, 2012, roč. 11, č. 9-10, s. 22-24.
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✓ ZAMBORIOVÁ, M. - HARAKSIMOVÁ, M. 2012. Bezpečné podávanie intravenózneho liečiva I. In Sestra. ISSN 1335-9444, 2012, roč. 11, č. 3-4, s. 24-25.
✓ Fotografie - foto archív autora