

BOGUMIŁA KOSICKA<sup>1</sup>, ANNA KSYKIEWICZ-DOROTA<sup>2</sup>, KINGA KULCZYCKA<sup>5</sup>,  
EWA STYCHNO<sup>5</sup>, KATARZYNA PIASECKA<sup>3</sup>, BARTŁOMIEJ DROP<sup>4</sup>

## Decision making models in various fields of nursing

### Abstract

**Introduction.** Identification of the process of decision making by nurses is a basis for better preparation of future nurses to an independent, and at the same time, effective decision making. This is related with the provision of high quality nursing services.

**Aim.** The objective of the presented study was identification of the decision making models applied by Polish nurses, and investigation of the relationship between specificity of work in individual wards and the applied model of decision making.

**Material and methods.** The research instrument was the Finnish 56-item questionnaire form examining decision making by nurses. This questionnaire was translated and adjusted to the Polish conditions, and its psychometric properties were confirmed concerning validity and reliability. The study covered nurses employed in conservative treatment wards (n=977), surgical wards (n=361) and intensive care units (n=293); a total number of 1631 Polish nurses employed in the hospitals was examined.

**Results.** Analysis of data showed that nurses from various wards in the study applied four models of decision making: analytical, intuitive, analytical-intuitive, and intuitive-analytical. Selection of the model used was associated with the specificity of work in individual wards.

**Conclusions.** The studies confirmed that during the process of decision making the nurses used both analytical and intuitive approaches, according to the type of ward and the specificity of the work of a nurse.

**Keywords:** decision makings models, nursing, hospital ward.

DOI: 10.2478/pjph-2019-0021

### INTRODUCTION

Clinical decision making is a very important element of nursing practice. The skill of effective clinical decision making in nursing is the most important factor which exerts an effect of the quality of the services provided [1-3].

Many authors describe clinical decision making as a process in which nurses, by using the collected information concerning a patient, evaluate his/her condition and select the best option for nursing care [2,4-6]. Decision making in clinical practice is a complex activity, which requires from those who make the decisions a comprehensive knowledge within the scope of important aspects of nursing, access to reliable sources of information, and adequate standards in patient care. Thus, knowledge of the problem of clinical decision making is extremely important. Understanding the way in which nurses make decisions provides great opportunities for education and development of intellectual and cognitive skills, indispensable for decision making [5].

The review of international literature confirmed that decision making by nurses has been widely explored and discussed. The research interests focused mainly on the investigation

and determination of models of decision making by nurses, and the factors which exert an effect on the decisions made. Many researchers in their reports suggested the need for further studies on the decision making process, due to the considerable differences in the strategies of making decisions in individual fields of nursing or in individual countries [7-9]. In appreciation of the importance studies concerning the decision making process, this problem has been undertaken in Poland. To-date, Polish studies have been scarce, and have focused mainly on the result of the decision process, and to a very limited extent have concerned the entire process, resulting in a lack of knowledge pertaining to the method of making decisions by nurses. The authors of the presented report hope that a precise identification of the decision making process will be a basis for better preparation of future nurses for an independent, and simultaneously effective, decision making. It may also constitute a considerable contribution to the development of international knowledge concerning decision making in nursing.

<sup>1</sup> Chair and Department of Management in Nursing, Faculty of Health Sciences, Medical University of Lublin, Poland

<sup>2</sup> Chair and Department of Management in Nursing, Faculty of Health Sciences, Medical University of Lublin, Poland

<sup>3</sup> Department of Family Medicine and Community Nursing, Chair of Oncology and Environmental Health, Faculty of Health Sciences, Medical University of Lublin, Poland

<sup>4</sup> Department of Medical Informatics and Statistics with the E-learning Lab, Faculty of Health Sciences Medical University of Lublin, Poland

<sup>5</sup> Faculty of Science and Health, The John Paul II Catholic University of Lublin, Poland

## Background

The majority of initial and present studies of decision making in nursing is based on the theories of analytical decision making or information processing.

Analytical decision making is described as a planned, conscious and logical process containing a series of organized stages, which may be indicated by the decision maker. An analytical model of decision making assumes rational and logical acting by the decision maker. In this model, the decision maker possesses complete information concerning the decision-making situation and the possible variants in decision making [1,6,10].

Another conceptualisation of decision making is the theory of information processing. According to this theory, decision making is described as a relationship between short- and long-term memory, and four steps of the reasoning process are identified: collecting the cues, formulating hypotheses, interpretation of cues and evaluation of hypotheses [11-13]. This theory is a foundation for the studies of problem solving, and results from knowledge individually obtained in the field of interest. The above-mentioned theory of decision making is approached in medicine, as well as in nursing, as a hypothetical-deductive process delineating patient's problems using clinical judgement [2,14,15].

Benner, Tanner and Chesla based on their studies, initiated new understanding of decision making in nursing by claiming that intuition plays an important role during nursing decision making. The researcher described intuition as a process of decision making without using a conscious, logical, justifiable step by step process. Typical characteristics of an intuitive model comprise the speed of information processing, simultaneous use of clues, identification of the pattern and optimal action. Intuitive decision making is associated with an instant, direct understanding of the key elements of the situation. According to Benner, intuition is rooted in the skills of pattern recognition [16].

In the majority of nursing reports, intuition is presented as a part of the decision making process [17]. While reporting research findings, Taner suggested that decision making and clinical judgement-making involve an intellectual process, which possesses both rational and intuitive components [18].

The Hammond's Cognitive Continuum Theory, frequently described as a theory of analytical-intuitive decision making, combines intuitive and analytical reasoning [19]. According to this theory, various forms of the cognitive process may be ordered on two extremes. This process may follow along an analytical-intuitive continuum. As a result, the decision making process is neither purely intuitive nor purely analytical, but is rather a continuum between the two poles, with judgements located at points somewhere in between. Hammond's theory explains general and detailed relationships between the concepts of task and cognition, as well as the relationships between the type of tasks and way of perception. The Cognitive Continuum Theory indicates how the identification of a situation or task refers to cognition. Hammond states that identification is a common function of the properties of the task and cognitive process. This theory suggests six modes of decision making based on two continua: cognition and identification of the structure of the task. The cognitive continuum ranges from intuition to analysis, in accordance with the identified structure of the task, which may be well or poorly structured. The number and character of cues and information related

with the identified task plays a crucial role in Hammond's theory. The better structured the task, the more analytical type of procedure applied, whereas in a poorly structured task the decision making will be more intuitive [20].

In recent years, an opinion has been confirmed that nursing decision making requires both analytical and intuitive decision making processes, according to the type of nursing situation [1,4,15,21].

Attempts to investigate the process of decision making by nurses from the aspect of decision making models have been undertaken by many researchers, including Aitken [22], Cader [20], Lauri and Salanterä [9], Payne [23]. The results of these studies confirmed that various models of decision making are applied in accordance with the specificity of a ward.

According to Benner nursing problems solving in intensive care units is based, to a great extent, on intuitive decision making resulting from knowledge and experience [16]. Hansten and Washburn compared decision making between nurses employed in a hospital ward and community nurses. Their comparisons showed close similarities between these groups [24]. Polge explored decision making by paediatric nurses and found that all nurses in the study applied an analytical model of decision making [25]. Studies carried out by White indicated that an analytical process of decision making was primarily specific for community-family nurses and those employed in long-term care [3].

Henry investigated the effect of a patient's state on making clinical decisions in the nursing environment. According to Henry, the complexity of tasks and amount of available information pertaining to the tested hypotheses exert a significant effect on the strategy of decision making [8].

Among important international studies of nursing decision making, there are those conducted by Lauri and Salanterä from the Turku University in Finland [9,14,26,27]. They developed an instrument which allowed the identification of the process and models of decision making applied by nurses in various fields of their practice. In their reports, Lauri and Salanterä were the first to present an analytical-intuitive model of nursing decision making. They confirm that the individual steps of decision making may be more or less analytical or intuitive. The results of studies of the above-mentioned researchers also showed that decision making models differ in individual nursing specialties [9,14,26,27]. In their reports, Lauri & Salanterä emphasize that the process of decision making by nurses takes the course in the same way in all clinical situations; therefore, there is a need for investigating the decision making process in all fields of nursing care due to different demands in these domains [26].

Studies by Lauri and Salanterä conducted in Canada, Finland, Norway, and the United States confirmed that nurses apply various decision making models according to the field of practice. The model of decision making by Canadian community-family nurses was intuitive, whereas by Finnish nurses – analytical. American and Norwegian nurses made decisions using analytical-intuitive model. The researchers explained the presented differences in the preferred model of decision making used in the above-mentioned countries by the specificity of the systems of health care and varied scopes of duties, authority and responsibilities at nursing workplaces. The majority of studies concerning the process of decision making in nursing was conducted in short- and long-term care, intensive, psychiatric and primary health care [9,14,26,27].

In short- and long-term health care the analytical model of decision making was applied at the stage of data processing and identification of a patient's problem, whereas the intuitive model – in implementation, monitoring and evaluation. The analytical model was considerably more often used by nurses employed in long-term care, while in short-term care most nurses applied the intuitive model. In the total group of nurses in the study the stage of data collection was intuitive, while information processing and identification of problems – analytical [26].

Decision making models applied by Finnish, Irish and American nurses employed in psychiatry differed considerably. Nurses from Northern Ireland and Finland used mainly the analytical model of decision making. In the group of American nurses there dominated the intuitive model. In the total group in the study the collection of data was intuitive, while data processing and identification of problems – analytical [9]. In their studies, Lauri and Salanterä emphasize that the field of practice, as well as the country, exert a significant effect of the applied model of decision making [14].

General knowledge concerning decision making in nursing is comprehensive and widely dispersed. The identification of important factors which affect the making of nursing decisions is a premise for the improvement of the decision making process by nurses.

## AIM

The objective of the presented study was the provision of replies to the following three important questions:

1. What decision making models do Polish nurses apply?
2. What decision making models are applied by nurses at individual stages of the decision making process, i.e. collection of information, information processing, planning, implementation of nursing, monitoring and evaluation of nursing?
3. Are there any differences in decision making models between nurses employed in various fields of nursing?

## MATERIAL AND METHODS

### Instrument

The research tool was a standardized questionnaire form – the 56-item Nursing Decision Making Instrument, measuring and describing nursing decision making models, developed by Lauri and Salanterä from Turku University in Finland (Department of Nursing Science, University of Turku). This instrument was developed based on Hammond's Cognitive Continuum Theory, Dreyfus' theory referring to five-step acquisition of practical skills (Hammond, 1996; Dreyfus& Dreyfus, 1985), and the results of previous studies of nursing decision making, which had been carried out by the authors of the instrument.

The questionnaire consists of 56 statements (criteria) with a five-point Likert type scale: almost never (1 score), rarely (2 scores), sometimes (3 scores), frequently (4 scores), almost always (5 scores). The structure of the instrument reflects four steps of the decision making process:

1. collection of data;
2. data processing and identification of problems;
3. plan of action and implementation of the plan;
4. monitoring and evaluation.

Each of the above-mentioned steps of decision making contains 14 statements each in the research instrument. A half of the statements contained in the questionnaire form measures and describes analytical decision making, whereas the remaining half investigates intuitive decision making. Whether the questionnaire criterion is ascribed to analytical or intuitive model of decision making, is determined based on the key developed by the authors of the research instrument [14].

In order to conduct studies concerning decision making model applied by Polish nurses, a contact was established with the authors of the original Finnish research instrument. After obtaining consent from the authors of the original version, the instrument was translated into Polish, and then from Polish into English according to the procedure for translation of the research instrument. The translated instrument was sent to the author of the original version in order to confirm the understanding of its translated version. After agreement on the Polish version, the psychometric value of the instrument was explored.

Based on the analysis performed, it was found that the reliability and internal consistency of the scales of the questionnaire is comparable to the results of the original version. The general reliability of the questionnaire according to the Cronbach's alpha coefficient was 0.93 [28].

### Study group

The study group covered nurses employed in 45 hospitals in north-eastern and south-eastern Poland (22 local, 16 regional and 7 clinical hospitals) – 2500 nurses in surgical, conservative treatment wards and intensive care units. The questionnaire response rate was 67.8% (1694 questionnaire forms).

A total of 1631 correctly completed questionnaires were accepted for analysis, while the remaining 63 questionnaires were rejected due to the large proportion of missing data.

The greatest number of correctly completed questionnaires came from conservative treatment wards 49.90% (n=977), followed by surgical wards 22.13% (n=361), and intensive care units 17.96% (n=293).

### Data collection and statistical analysis

Prior to the study, letters were sent to the directors and managers of the nursing teams in individual hospitals in order to obtain consent for the study. After obtaining consent from the Bioethical Commission at the Medical University in Lublin and the management board of the hospitals, one of the authors of the presented report personally delivered the instruments and presented instruction for their completion to nurses in the selected hospitals. Participation was voluntary, and the respondents were guaranteed full anonymity. The nurses completed the questionnaires independently during working hours.

### Analysis

In order to distinguish the important decision making models, an analysis was performed using neural-fuzzy logic networks. A neural network with a fuzzy logic mechanism of concluding was applied, because the models were of an unclear and imprecise character. This means that a respondent may be characterized by partially intuitive and analytical model. Prior to the analysis by neuronal networks, the reliability was determined of generally perceived decision making models – intuitive and analytical, which were arbitrarily accepted by the Finnish authors of the instrument. For the intuitive model (with 28 statements evidencing the intuitive decision making

model), the value of Cronbach's alpha coefficient was 0.863, whereas for the analytical model (with 28 statements evidencing the analytical decision making model) Cronbach's alpha was 0.895. Therefore, it may be assumed that the above-mentioned scales are very reliable, and their use as input data for the neuronal-fuzzy logic networks is essentially justified and carries strong measurement information. Thus, mixed models were determined on their basis. Mixed models may be defined as those for which it is impossible to establish whether an individual person applies the intuitive or analytical model; however, it is possible to determine that in this person one model prevails. If this is an intuitive model, then it is assumed that the respondent uses the intuitive-analytical model, if on the level of  $p < .05$  – then the analytical model dominates over the intuitive model, this respondent applies the analytical-intuitive model. The neuronal network determined from each of 28 statements, a 28 dimension for the intuitive and analytical models separately. On this basis, the parameters of compound probability distributions are estimated for the characteristics of the intuitive and analytical models. In the process of construction of the model these distributions are subject to defuzzification at the stage of determining the degree of qualification of individual values to each of the equivalent fuzzy sets. Subsequently, the neuronal-fuzzy logic network in the conclusion block creates fuzzy classifiers. Fuzzy classifiers are aimed at describing the uncertain structure of the mixed models. The network creates fuzzy multi-dimensional boundaries.

In order to verify the relationship between the model of decision making and the ward where the nurses were employed, the chi-square test was applied and the repeated measures ANOVA, where the stage of decision making was the main independent variable, and the between-subject variable – the type of ward. This analysis was a basis for performing further analyses of the differences. The Duncan's test was applied as the method of post-hoc tests, when the ANOVA was  $p < .05$ .

Statistical studies were conducted using the statistical software STATISTICA® StatSoft® Version 8.0.

## RESULTS

During the decision making, the nurses most often used the analytical-intuitive model – 61% ( $n=994$ ), while 19% ( $n=303$ ) of the nurses in the study applied the intuitive-analytical model, and 14% ( $n=230$ ) – the analytical model of decision making. The decisions were most rarely made based on the intuitive model 6% ( $n=104$ ).

**TABLE 1. Relationship between the decision making model and type of ward where the nurses were employed.**

No.	Model of decision making	Surgical wards		Conservative treatment wards		Intensive care units		Total N
		N	%	N	%	N	%	
1.	Intuitive	19	5.26	56	5.73	29	9.90	104
2.	Analytical	86	23.82	106	10.85	38	12.97	230
3.	Intuitive-Analytical	44	12.19	196	20.06	63	21.50	303
4.	Analytical-Intuitive	212	58.73	619	63.36	163	55.63	994
5.	Total	361	100	977	100	293	100	1631
Chi <sup>2</sup> =51.842; $p < 0.001$								

Based on the Pearson test for independence, a highly significant statistically relationship was observed ( $p < 0.001$ ) between the decision making model and type of ward where the examined nurses were employed (Table 1).

In order to recognize in detail the method of decision making by nurses, the differences were analyzed between the analytical and intuitive models (without categorization into the mixed models) at individual stage of the decision making process, according to the type of ward where the nurses were employed.

It was found that the type of hospital ward had a significantly differentiating effect ( $p < 0.001$ ) on the model of decision making at all stages of the decision making process. Tables 2-5 present the results related to the level of significance for the variables discussed.

At the stage of collecting information, the analytical model most weakly occurred statistically in intensive care wards,  $\bar{x}=3.64$ . In conservative treatment wards, the intuitive model ( $\bar{x}=4.01$ ) was significantly stronger statistically ( $p < 0.001$ ) than the analytical model ( $\bar{x}=3.96$ ). Similarly, in intensive care wards the intuitive model ( $\bar{x}=3.96$ ) was significantly stronger statistically ( $p < 0.001$ ) than the analytical model ( $\bar{x}=3.64$ ) (Table 2).

The analytical model was dominant in all wards at the stage of processing information. At this stage, the intuitive model was most characteristic of nurses working in intensive care wards ( $\bar{x}=3.87$ ), while it most rarely occurred among nurses employed in surgical wards, where  $\bar{x}=3.59$ . The intuitive model of decision making at the stage of processing information was more frequent in conservative treatment wards ( $\bar{x}=3.82$ ), compared to surgical wards  $\bar{x}=3.59$  (Table 3).

The analytical model prevailed in all hospital wards in the study at the stage of planning ( $p < 0.001$ ), and was applied at a similar level by the nurses examined. The intuitive model at the stage of planning was most often used in conservative treatment wards ( $\bar{x}=3.64$ ), while it was most rarely applied in intensive care units ( $\bar{x}=3.39$ ) (Table 4).

The analytical model of decision making was more frequently applied than the intuitive model in the group of nurses employed in conservative treatment and surgical wards ( $p < 0.001$ ) at the stage of implementation of nursing, and monitoring and evaluation. The analytical model at this stage was the strongest ( $\bar{x}=4.09$ ) in conservative treatment wards, whereas it was the weakest in intensive care units, where the mean value was 3.92. The intuitive model was most strongly manifested in intensive care units ( $\bar{x}=3.96$ ), while most weakly in surgical wards, where the mean value was  $\bar{x}=3.87$  (Table 5).

Based on the results of post-hoc Duncan test and the mean values for decision making models at individual stages of the decision making process for individual wards (Figure 1), it was found that nurses employed in intensive care unit were characterized by a lower level of analytical model at the stage of collecting information, compared to nurses in surgical and conservative care wards. The same situation was noted in the case of intuitive model at the stage of planning. Charge nurses in the surgical wards, compared to the remaining two groups of nurses, were characterized by the lowest level of intuitive model at the stage of processing information, implementation of nursing, and monitoring and evaluation. Among nurses in intensive care units, the analytical model occurred more strongly at the stage of information processing and planning, compared to the remaining nurses. It was confirmed that

**TABLE 2. Stage of collecting information, and analytical and intuitive models in individual wards.**

No.	Type of ward	Stage (Model)	{1} $\bar{X}=3.9474$	{2} $\bar{X}=3.9145$	{3} $\bar{X}=3.9603$	{4} $\bar{X}=4.0154$	{5} $\bar{X}=3.6445$	{6} $\bar{X}=3.9620$
1	Surgical	Collection of information (Analytical)		.170804	.794209	.111036	<b>.000011</b>	.725108
2	Surgical	Collection of information (Intuitive)	.170804		.269118	.068050	<b>.000009</b>	.387785
3	Conservative treatment	Collection of information (Analytical)	.794209	.269118		<b>.028712</b>	<b>.000003</b>	.963480
4	Conservative treatment	Collection of information (Intuitive)	.111036	.068050	<b>.028712</b>		<b>.000004</b>	.280296
5	Intensive care	Collection of information (Analytical)	<b>.000011</b>	<b>.000009</b>	<b>.000003</b>	<b>.000004</b>		<b>.000004</b>
6	Intensive care	Collection of information (Intuitive)	.725108	.387785	.963480	.280296	<b>.000004</b>	

F(2.1628)=45.14; p&lt;.001\*

– values in individual boxes of the table within the interval from 0 to 1 are levels of significance for the comparisons between groups.

**TABLE 3. Stage of processing information, and analytical and intuitive models in individual wards.**

No.	Type of ward	Stage (Model)	{1} $\bar{X}=4.0120$	{2} $\bar{X}=3.5945$	{3} $\bar{X}=4.0105$	{4} $\bar{X}=3.8252$	{5} $\bar{X}=4.0732$	{6} $\bar{X}=3.8744$
1	Surgical	Information processing (Analytical)		<b>.000004</b>	.975220	<b>.000005</b>	.217045	<b>.000577</b>
2	Surgical	Information processing (Analytical)	<b>.000004</b>		<b>.000003</b>	<b>.000012</b>	<b>.000004</b>	<b>.000011</b>
3	Conservative treatment	Information processing (Analytical)	.975220	<b>.000003</b>		<b>.000011</b>	.234995	.000462
4	Conservative treatment	Information processing (Analytical)	<b>.000005</b>	<b>.000012</b>	<b>.000011</b>		<b>.000004</b>	.320664
5	Intensive care	Information processing (Analytical)	.217045	<b>.000004</b>	.234995	<b>.000004</b>		<b>.000003</b>
6	Intensive care	Information processing (Analytical)	<b>.000577</b>	<b>.000011</b>	<b>.000462</b>	.320664	<b>.000003</b>	

F(2.1628)=31.94; p&lt;.001\*

**TABLE 4. Stage of planning the analytical and intuitive models in individual wards.**

No.	Type of ward	Stage (Model)	{1} $\bar{X}=4.0572$	{2} $\bar{X}=3.4927$	{3} $\bar{X}=4.0246$	{4} $\bar{X}=3.6391$	{5} $\bar{X}=4.1229$	{6} $\bar{X}=3.3904$
1	Surgical	Planning (Analytical)		<b>.000003</b>	.515427	<b>.000011</b>	.191610	<b>.000004</b>
2	Surgical	Planning (Analytical)	<b>.000003</b>		<b>.000011</b>	<b>.003591</b>	<b>.000004</b>	<b>.041632</b>
3	Conservative treatment	Planning (Analytical)	.515427	<b>.000011</b>		<b>.000009</b>	.063646	<b>.000003</b>
4	Conservative treatment	Planning (Analytical)	<b>.000011</b>	<b>.003591</b>	<b>.000009</b>		<b>.000003</b>	<b>.000012</b>
5	Intensive care	Planning (Analytical)	.191610	<b>.000004</b>	.063646	<b>.000003</b>		<b>.000004</b>
6	Intensive care	Planning (Analytical)	<b>.000004</b>	<b>.041632</b>	<b>.000003</b>	<b>.000012</b>	<b>.000004</b>	

F(2.1628)=45.33; p&lt;.001\*

**TABLE 5. Stage of implementation of nursing, and monitoring and evaluation, and analytical and intuitive model in individual wards.**

No.	Type of ward	Stage (Model)	{1} $\bar{X}=4.0120$	{2} $\bar{X}=3.5945$	{3} $\bar{X}=4.0105$	{4} $\bar{X}=3.8252$	{5} $\bar{X}=4.0732$	{6} $\bar{X}=3.8744$
1	Surgical	Implementation of nursing, and monitoring and evaluation (Analytical)		<b>.000007</b>	<b>.015441</b>	.361111	.241167	.551323
2	Surgical	Implementation of nursing, and monitoring and evaluation (Analytical)	<b>.000007</b>		<b>.000004</b>	.132684	.176317	.083652
3	Conservative treatment	Implementation of nursing, and monitoring and evaluation (Analytical)	<b>.015441</b>	<b>.000004</b>		<b>.000003</b>	<b>.000465</b>	<b>.000349</b>
4	Conservative treatment	Implementation of nursing, and monitoring and evaluation (Analytical)	.361111	.132684	<b>.000003</b>		.497682	.764947
5	Intensive care	Implementation of nursing, and monitoring and evaluation (Analytical)	.241167	.176317	<b>.000465</b>	.497682		.104589
6	Intensive care	Implementation of nursing, and monitoring and evaluation (Analytical)	.551323	.083652	<b>.000349</b>	.764947	.104589	

F(2.1628)=18.70; p&lt;.001\*



among nurses employed in conservative treatment wards, the intuitive model of decision making was more frequently used at the stage of collecting information, planning and implementation of nursing, as well as monitoring and evaluation. It was also observed that in the case of nurses employed in conservative treatment wards and intensive care units, the intuitive model of decision making prevailed at the stage of collecting information. The analytical model was dominant at the stage of information processing, planning and implementation of nursing, and monitoring and evaluation. Nevertheless, among surgical nurses comparable levels of intuitive and analytical models were found at the stage of collecting information.

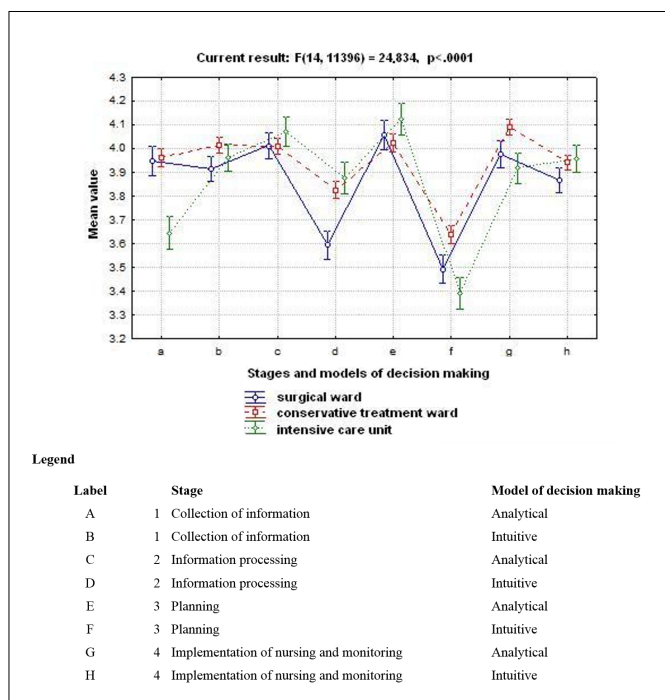


FIGURE 1. Mean values for decision making models at individual stages of the decision making process in individual wards.

## DISCUSSION

The objective of the presented studies was determination of the decision making models by Polish nurses, and investigation of the relationship between decision making models and the nurses' place of work. The research instrument used was applied in many countries, among others, in Finland, Germany, Northern Ireland, and the United States. Using the above-mentioned instrument, the nursing decision making process was described and decision making models determined [14]. The instrument adjusted to the Polish conditions was successfully used in Polish hospital wards in order to explore the decision making process in nursing.

The results of the study showed that Polish nurses applied four models of decision making, i.e.: analytical, analytical-intuitive, intuitive-analytical, and intuitive.

The analytical-intuitive model was most frequently used. The intuitive model, compared to other wards, was most often applied in intensive care units. The analytical model was most frequently used in surgical wards; while the intuitive-analytical model – in intensive care units and conservative treatment wards, and analytical-intuitive model – in conservative treatment wards.

Based on the results of the tests performed, it was also found that nurses employed in intensive care units were characterized by a lower level of analytical model at the stage of collecting information than those from surgical and conservative treatment wards. The same situation was observed in the case of the intuitive model at the stage of planning. Charge nurses in surgical wards, compared to the remaining two groups of nurses, most rarely applied the intuitive model at the stage of processing, implementation of treatment and monitoring and evaluation. Among nurses in intensive care units, compared to the remaining nurses, the analytical model was most strongly manifested at the stage of information processing and planning. Among nurses employed in conservative treatment wards and intensive care units at the stage of collecting information, the intuitive model of decision making dominated, whereas at the stage of information processing and planning, the analytical model prevailed.

A comparable level of analytical and intuitive models occurred among nurses employed in intensive care units at the stage of implementation of nursing, monitoring and evaluation, as well as among nurses in surgical wards at the stage of collecting information.

According to the studies by Lauri and Salanterä, the model of decision making among nurses employed in intensive care units at the stage of implementation and monitoring was intuitive, while at the stage of collecting data, information processing, identification of problems and constructing the plan of action, was different in individual countries. Swedish nurses working in intensive care units more frequently applied the analytical model of decision making than nurses in the remaining countries, i.e. Canada and the United States. In their reports, Lauri and Salanterä emphasize that nurses employed in intensive care units, due to their multi-dimensional theoretical essentials, use both the analytical and intuitive models of decision making [26].

Intuitive decision making in intensive care was investigated by, among others, Payne and Reichman R & Yarandi. In their studies, nurses described intuition as a sensation or knowledge. They claimed that intuition is a part of the process of decision making in clinical nursing. The nurses used intuition at various stages of decision making; however, basically during implementation and evaluation. Nursing knowledge, experience and professional competence were evaluated using intuition as a capability for performing observations and combining them with earlier experience [2,24,29,30].

Björk and Hamilton conducted studies by means of the 24-item Nursing Decision Making Instrument, which was an abbreviated version of the original 56-item Nursing Decision Making Instrument applied in the presented study. The above-mentioned researchers showed a significant relationship between the decision making model and the domain of nursing practice. They confirmed that nurses working in surgical wards more often apply the intuitive model of decision making, compared to those employed in conservative treatment wards. These differences are explained by the fact that in patients in surgical wards there may occur more rapid changes in the state of health, than among patients who receive conservative treatment. Therefore, nurses working in surgical wards may more often face tasks characterized by lack of clarity and lack of complete information concerning the decision making situation. Due to such tasks, the nurses tend to use the intuitive model of decision making [5,7].

According to Bjørk and Hamilton nurses at the stage of collecting information and implementation of nursing, as well as monitoring and treatment, apply mainly the analytical model of decision making. The intuitive model is more often used at the stage of information processing. At the stage of planning, nurses use both the analytical and intuitive models of decision making [7,25].

Considering the results of the presented study and the results presented by other researchers, it may be presumed that decision making varies according to the type and context of the care provided by nurses in various wards and countries. The causes of the differences in the models of decision making used by Polish nurses may be sought for in the specificity and organization of work in individual wards and nursing specialties. Here, it seems important to mention that intensive care units considerably differ from other hospital wards. In intensive care units there are hospitalized patients in a severe state (unconscious), who require constant monitoring of life functions, observation, and complicated treatment and nursing. The frequently changing state of the patients requires from nurses an instant understanding of the key elements of the situation, and quick decision making, usually with a poor scope of information. In turn, nursing activities in conservative treatment and surgical wards vary, and cover different aspects of human health and life. This means that the solving of nursing problems cannot be based solely on intuition, without a conscious collection of information about patients and their environment. Here, the identification of problems, planning and provision of nursing care is a time-consuming effort which, to a great extent, requires an analytical approach.

## CONCLUSIONS

The presented studies, conducted for the first time in Poland, allowed for a general recognition of the decision making process by Polish nurses. The questionnaire applied enabled an analysis of general information concerning the process of decision making among a large group of nurses, and comparing the methods of making nursing decisions in various domains of nursing.

While considering the presented results of the study, it is noteworthy that in the process of decision making in nursing, both analytical and intuitive approaches to the method of decision making play an equally important role, while the decision making differs considerably in individual countries. Therefore, it may be presumed that the above-mentioned studies are important for recognition of the decision making process in international nursing.

The results of the presented study also constitute an important challenge for nursing education in Poland, because the teaching of all nursing theories of decision making has not been considered in educational schedules of nursing studies specialties. Students of nursing are not being educated in the skills of effective decision making, as well as making decisions in various nursing situations.

In Poland, there are very few reports concerning nursing decision making and methods of an effective education in making decisions in various fields of practice.

Decision making is an inseparable part of nursing practice, and should be based on scientific evidence. Nurses must be aware of the theories concerning decision making. Therefore, due to cognitive and utilitarian reasons, further exploration of

this process is recommended, and the factors which affect it, in order to develop optimum scientific essentials allowing the best possible preparation of the future nursing staff for independent and effective decision making.

## REFERENCES

1. Nibbelink CW, Brewer BB. Decision-making in nursing practice: An integrative literature review. *J Clin Nurs*. 2018; 27(5-6).
2. Standing M. Clinical decision-making skills on the developmental journey from student to Registered Nurse: a longitudinal inquiry. *J Adv Nurs*. 2007;60(3):257-69.
3. White A. Clinical Decision Making Among Fourth-Year Nursing Students: An Interpretive Study. *Journal of Nursing Education*. 2003;42(3):113-20.
4. AL-Dossary R, Panagiota K, Maddox PJ. The impact of residency programs on new nurse graduates' clinical decision-making and leadership skills: A systematic review. *Nurse Educ Today*. 2014;34(6):1024-8.
5. Banning M. A review of clinical decision making: models and current research. *J Clin Nurs*. 2008;17:187-95.
6. Manias E, Aitken R, Dunning T. Decision-making models used by 'graduate nurses' managing patients' medications. *Journal of Advanced Nursing*. 2004;47:270-8.
7. Bjørk IT, Hamilton GA. Clinical decision making of nurses Working in Hospital Settings. *Nurs Res Pract*. 2011;1-8. doi:10.1155/2011/524918
8. Henry SB. Effect of level of patient's acuity on clinical decision making of critical care nurses with varying levels of knowledge. *Heart Lung*. 1991;20:478-85.
9. Lauri S, Salanterä S. Decision making of psychiatric nurses in Finland, Northern Ireland, and the United States. *J Prof Nurs*. 1999;15(5):275-80.
10. O'Neill ES, Dluhy NC, Chun E. Modelling novice clinical reasoning for a computerized support system. *J Adv Nurs*. 2005;26:825-32.
11. Dickison P, Luo X, Kim D, et al. Assessing higher-order cognitive constructs by using an information-processing framework. *JATT*. 2016;17(1):1-19.
12. Dowding D, Spilsbury K, Thompson C, et al. The decision making of heart failure specialist nurses in clinical practice. *J Clin Nurs*. 2009;18(9):1313-24.
13. Dreyfus H, Dreyfus S. *Mind over machine: The power of human intuition and expertise in the era of computer*. New York: Free Press; 1985.
14. Lauri S, Salanterä S. Developing an instrument to measure and describe clinical decision making in different nursing fields. *J Prof Nurs*. 2002;18(2):93-100.
15. Tiffen J, Corbridden SJ, Slimer L. Enhancing clinical decision making: Development of a contiguous definition and conceptual framework. *J Prof Nurs*. 2014;30(5):399-405.
16. Benner P, Tanner C, Chesla C. From beginner to expert: gaining a differentiated clinical world in critical care nursing. *Adv Nurs Sci*. 1992;14(3):13-28.
17. Effken J. Informational basis for expert intuition. *J Adv Nurs*. 2001;34:246-55.
18. Tanner C. Teaching clinical judgment. In: J. Fitzpatrick. R. Taunton. *Annual review of nursing research*. New York: Wiley; 1987. p. 153-73.
19. Hammond K. *Human judgement and social policy: Irreducible uncertainty, inevitable error, unavoidable injustice*. New York: Oxford University Press; 1996.
20. Cader R, Campbell S, Watson D. Cognitive Continuum Theory in nursing decision making. *J Adv Nurs*. 2005;49(4):397-405.
21. Wieland DM, Altmiller GM, Dorr MT, Wolf ZR. Situational transitions: education. Clinical transition of baccalaureate nursing students during preceptored, pregraduation practicums. In: AI. Meleis. *Transitions Theory. Middle range and situation specific theories in nursing research and practice*. New York, NY: Springer Publishing Company; 2010. p.293-300.
22. Aitken LM, Marshall A, Elliott R, Mckinley S. Comparison of "think aloud" and observation as data collection methods in the study of decision making regarding sedation in intensive care patients. *IJNS*. 2011;48:318-25.
23. Payne LK. Toward a theory of intuitive decision. *Making in Nursing*. 2015;28(3).
24. Miller EM, Hill PD. Intuition in clinical decision making: differences among practicing nurses. *JHN*. 2017 <https://doi.org/10.1177/0898010117725428>
25. Nibbelink CW, Brewer BB. Decision-making in nursing practice: An integrative literature review. *J Clin Nurs*. 2018;27(5-6).
26. Lauri S, Salanterä S. Decision-making models in different fields of nursing. *Res Nurs Health*. 1998;21:443-52.

27. Lauri S, Salanterä S. Decision-making models of Finnish nurses and public health nurses. *J Adv Nurs*. 1995;21:520-7.
28. Kosicka B, Ksykiewicz-Dorota A. Validation of the Polish version of the Lauri and Salanterä survey tool for identifying models of decision making in nurses' workplaces. *Med Biol Sci*. 2009;23(1):45-9.
29. Maharmeh M, Alasad J, Salami I, Saleh Z, Darawad M. Clinical decision – making among critical care nurses. *Qual Stud Health*. 2016;8:1807-19.
30. Randell R, Mitchell N, Thompson C, McCaughan D, Dowding D, Cullum N. Supporting nurse decision making in primary care: exploring use of and attitude to decision tools. *Health Inform J*. 2008. (In press).

**Corresponding author**

Dr Bogumiła Kosicka  
4/6 Staszica St., 20-081 Lublin  
E-mail: bogusia.kosicka@gmail.com