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*Evaluation of motor efficiency with respect to self-care
of neurological patients*

Self-care is the process consisting in the skill to cope with everyday activities associated with biological functioning of the body. It also has a psychological aspect, as motor efficiency deficit negatively affects well-being and the quality of life. We speak of involvement in self-care in the case of the disabled who are totally incapable of performing everyday activities. Efficiency with respect to self-care is the degree of independence of a disabled person in the area of personal hygiene, supporting respiratory and cardiovascular systems, consumption of meals, rehabilitation of sphincter muscles and participation in the prophylaxis of the most frequent complications. The first step in training disabled patients into self-care is their mobilization (1, 4, 5, 6, 9, 13).

The determination of the degree of efficiency in self-care was based on the evaluation of the following activities: range of motion; moving in bed; assuming vertical position (taking a seat, sitting, getting up, standing); moving (independent walking, using devices, mobility with the use of a wheel chair); personal hygiene (oral cavity hygiene, washing hair, combing hair, taking a bath, dressing, putting on shoes); support of external respiratory and cardiovascular conditions (respiratory exercises with coughing up, change of position, loose dressing, non-smoking, indoor microclimate, assuming proper position of the lower extremities and their massage in order to prevent thrombosis); consumption of meals; participation in the regulation of the function of sphincter muscles consisted in the knowledge of procedures in uninhibited bladder – after cerebral stroke, in retention of urine and urinary incontinence – in multiple sclerosis and radix syndrome as well as in constipation and neurogenic faecal incontinence; skills of preventing some neurological complications (counteracting contractures and muscular atrophy, bedsores, bony ankylosis, incomplete dislocation of shoulder joint). Four criteria determining the degree of independence in self-care were distinguished: from total independence – 3 scores, through slight limitations (patients requiring instruction and protection – support-training system – 2 scores, considerable limitations (the need for considerable assistance from the staff – partly-compensatory system – 1 score, and lack of independence (activities performed for a patient – totally compensatory system) – 0 score.

The aim of the study was an evaluation of motor efficiency with respect to self-care.

MATERIAL AND METHODS

The study covered 430 patients of experimental group (E) and 215 patients of control group (C). The experimental group (E) covered patients aged 20–70. Females dominated in the population examined. The greatest number of patients underwent cerebral stroke – 130, including 40 males and

90 females, followed by multiple sclerosis – 50 (20 males and 30 females) and radix syndrome – 35 (15 males and 20 females). The control group (C) represented the same data. The study was conducted by the method of nursing experiment, and samples for the study were selected by the method of matching (3) – the selection of respondents in pairs representing the same socio-demographic data and identical level of efficiency in self-care. The process of selection at random of the population for the study was impossible due to the fact that the number of respondents was insufficient for double sampling, therefore the experimental and control groups were selected by the method of matching (3). The application of the experiment requires the usage of various research techniques in order to determine changes which took place as a result of experimental stimulus; here, the method of work called a 'nursing process' (3, 10), therefore, a direct observation was applied and the history taking, instrumental and manual nursing activities were registered with the use of the index of activities. The study was repeated three times with the same patients at defined time intervals.

In the traditional model of nursing, the nurses are guided by intuition and their work is performed in a routine way. Services are provided incidentally, and not in a planned, systematic and continuous way. The nurses' attitude towards patients is often dominating and directive, the staff does not ascribe much importance to the provision of proper atmosphere in the ward (7, 8, 11, 12). In the nursing process, method skills in performing instrumental manual procedures are equally as important as in traditional nursing. In addition, this method covers the approach to the patient as a whole and as an individual, which means taking into account biological, psychological and social aspects. It is preceded by a detailed analysis of the state of a patient and does not consist in merely performing everyday routine activities according to defined schemes (2).

Two research groups were distinguished in the study: experimental group (E) and control (C). In the experimental group (E) a stimulus was introduced in the form of the method of work called 'nursing process', while the control group (C) represented traditional nursing.

RESULTS

In Experiment 1, nearly 50% of the respondents were immobilised (*lack of independence*), a slightly smaller number of patients showed *considerable limitations* of motor efficiency and used an orthopaedic Zimmer frame, axillary and elbow crutches. A few had *slight limitations* which consisted in using a stick or the assistance of another person. There were no respondents who moved independently. In Experiments 2 and 3, there were no immobilised patients (*lack of independence*), while the number of those with *considerable limitations* increased to over 50% in both groups. A considerable increase was also observed in the number of respondents with *slight limitations* in both groups. The percentage of independent patients increased to only several percent in Experiment 2; however, in Experiment 3 it considerably increased to one third of the respondents, but only in the experimental group. In the control group (C) the category *independence* was not represented in any of the experiments.

With respect to self-care, the *lack of independence* occurred only in Experiment 1 in nearly 50% of patients of both groups. In the subsequent experiments passive attitudes were no longer noted in group E, whereas in group C – only few, i.e. in the area of supporting cardiovascular parameters and prevention of complications. A considerable percentage of patients in both groups showed *considerable limitations* in Experiment 1; in Experiment 2 this percentage increased to over 50% of respondents; in Experiment 3, however, a decrease of more than 10% was observed equally in both groups.

In Experiment 1 only a small number of patients showed *slight limitations*; however, this number increased four times in Experiment 2 and six times in Experiment 3. In group E, a considerable increase was noted in the field of prevention of complications – to over 50% of respondents in Experiment 2, while a decrease was observed in Experiment 3. In group C a systematic increase of these skills was noted in subsequent experiments.

A few patients showed *independence* with respect to self-care in Experiment 1; in Experiment 2 the proportions did not change much, in Experiment 3 – radical changes were noted, but only in group E, where the percentage ranged within 26.5%–74.0%. Patients of group C did not show full *independence* in any experiment.

As a result of rehabilitation and self-care activities all patients who were not self-reliant (*lack of independence*) in Experiment 1, after each subsequent experiment acquired defined skills and qualified into the category of *independence*, i.e. obtained complete efficiency in self-care, but only in group E. For patients of group C the highest category were *slight limitations*.

Classification of totally dependent patients into higher categories, mainly in group E, was the effect of nursing activities training into self-care. Group C, which was not subject to organized activities, showed less dynamics in this respect; self-care activities were also realised, but they were not recognized, planned and evaluated, and resulted from everyday routine nursing activities during which patients and their families participated in activities connected with hygiene, nutrition and other everyday activities, according to their possibilities. Considerable progress was observed in all patients, especially among those representing a low scope of *independence* in Experiment 1, and acquired full independence in the final phase of the study.

The presented values define the mean efficiency in self-care (derivative of three experiments) in both groups. The differences between groups defined by means of test t function were statistically significant, apart from the first experiment (the data being the same, as such was the requirement of the experiment) on the level of significance $p = 0.006$ – for the second, and $p = 0.001$ – for the third experiment.

A positive correlation was observed with respect to efficiency in self-care in individual experiments and groups, this correlation being higher between the values of the first and the second experiment in both groups. In the subsequent experiments, greater differences were observed in group E, compared to group C, where the values were close to Experiment 1, i.e. more strongly correlated with it.

The determination coefficient (DC – square correlation coefficient x 100) ($0.77 \times 0.77 \times 100$) was also calculated, which in Experiment 2 in group E was 59.0%, which means that only within this range the results of Experiment 2 were determined by the results of Experiment 1, while the remaining 41.0% was due to other factors, here the activities training patients into self-care. In Experiment 3, the determination coefficient obtained in group E was 41.0%, therefore an increase in self-care efficiency in 59.0% was due to the nursing activities. In group C the proportions were different, where the DC was 54.8% – for Experiment 2, and 49.0% – for Experiment 3. Thus, the nursing activities were less important here than in group E (in Experiment 1 – 45.2% and in Experiment 2 – 51.0%).

DISCUSSION

The study was conducted based on the nursing experiment consisting in the introduction of a stimulus in the form of work called a 'nursing process' and the determination of its effect on the efficiency in self-care in neurological patients in group E and group C without this stimulus. The method of 'matching' provided an objective selection of the population for the study, in couples possessing equal values of variables in Experiment 1, which was the requirement of the study.

In the initial phase of the study in each group (E and C) over 50% of patients were immobilised and not self-reliant with respect to self-care activities, such as personal hygiene, activities connected with nutrition, respiration, excretion, and prevention of the most frequent neurological complications. Due to the physical rehabilitation and training into self-care, the state of the majority of patients, which was initially defined as passive changed, these patients obtaining the highest category, i.e. *independence* (group E), while in group C – category *slight limitations*. All patients in both groups

were trained into self-care; however, in group C this process took place according to the adopted permanent, traditional, doctor's order-based nursing procedure, and not according to independent, organised activities as in group E. The process of convalescence also affected the result of the study. The total analysis of results allows us to conclude that due to the organised activities with respect to training the patients of group E into self-care, this process was more effective.

The correlation between individual experiments was stronger in group C, compared to group E, which is evidence of a greater progress in self-care in group E, where the results obtained were less strongly correlated. The determination coefficient in both groups shows that in group E the contribution of nurses in the process of shaping motor efficiency was greater.

CONCLUSIONS

1. The results of the experiment confirmed that shaping of the process of motor efficiency is faster and more effective in patients managed by the method of the 'nursing process' than by the traditional method.

2. The level of self-care among patients in the study was higher in the experimental group (E), compared to the control group (C).

3. The correlation coefficient between individual experiments was higher in group C, which confirms that in group E more favourable changes took place.

4. The determination coefficient confirmed that the contribution of nurses to obtaining by patients independence in self-care was higher in group E.

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SUMMARY

Based on the data obtained from the individual measurements, progress was noted in locomotor and self-service activities. In the experimental group, patients who were immobilized during the initial stage of the study, regained independence to a considerable extent to the end of the study – more so in Group E (experimental), compared to Group K (control). Non-significant differences were noted between the two groups in the values concerning self-service independence; however, the effects were higher in Group E, and the differences indicated by means of the test function remained on the level of significance $p = 0.001$.

Ocena wydolności motorycznej i niezależności w samoobsłudze pacjentów neurologicznych

Na podstawie uzyskanych wyników badań z poszczególnych pomiarów stwierdzono postęp w zakresie czynności motorycznych i samoobsługi. W grupie eksperymentalnej (E) pacjenci unieruchomieni w pierwszej fazie badań usamodzielnili się pod ich koniec, bardziej aniżeli w grupie kontrolnej (K). Wartości niezależności w samoobsłudze nie różniły się znacząco w obu grupach, chociaż efekty końcowe były wyższe w grupie E na poziomie istotności $p = 0.001$.