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### **Balance of Nurses' Working Time as Exemplified by the Nurses Employed in Intensive Cardiological Care Units and Cardiological Wards**

Bilans czasu pracy pielęgniarek zatrudnionych w jednostkach intensywnej opieki  
kardiologicznej i oddziałach kardiologicznych

Баланс рабочего времени медицинских сестёр  
в пунктах интенсивного кардиологического наблюдения  
и в кардиологических отделениях

Systems of health protection are currently the most rapidly developing fields of national economy in numerous countries, regardless the social and economical form of their governments (3). This development is to a certain degree conditioned by pressure of social demands. The strength of the revealed need for health care is determined by many factors. It is higher when the higher level of fulfilment of other needs has been achieved and especially when the needs essential for living are provided for. WHO in the international comparative studies accepted the assumption that the need for health care is determined by predisposing factors, enabling factors and factors of health policy (5).

In Poland the above mentioned factors and the free health care for all working people including individual farmers stimulate the rapid increase of needs for the care. Simultaneously increase of health threat connected with negative influence of development of technique and civilization is observed. That is why the system of health protection faces a very up-to-date and difficult problem: how to maintain the stability between the demands for care with personnel, material, financial, and ideological resources.

While solving this problem the professional manpower must be considered first. Human potential regarded from the point of view of its num-

ber shows the particular shortage in the group of nurses. In 1981 the lowest increase in the employment of nurses and in seven provinces even the decrease was noted (6). That is why many hospital wards were closed, beds remained unutilized, the operation dates were postponed (2). In fact there is a great need for a place in hospital at present and modern hospital wards built and equipped with high costs have not been fully exploited.

The undertaken studies aimed at determining the amount of working time for nurses in hospital wards, determining the rate of utilization of nominal time and designation the disposal time in relation to the attended patient; next, they aimed at determining the structure of expenditure of disposal time by nurses.

#### MATERIAL AND METHOD

The material comes from two research samples comprising four types of hospitals where patients with circular system disorders can be admitted. In 1981 the analysis included working time of nurses employed in seven organizational units i.e. two intensive care units of the Set of Health Care, that is intensive cardiological units and two cardiological wards with intensive cardiological care units in provincial hospitals and departmental hospital and in three cardiological clinics. In 1982 the research material was similar.

The collected material used the analysis of documentation content method dealing with working time of 190 nurses. The procedure establishing the amount of distinguished categories of time included sequence of steps described in literature (4) with the little modification. We subtracted free time ( $T_f$ ) from the calendar time ( $T_c$ ) that was the general amount of working time during the succeeding calendar days of the given period of time, counting 8 hrs per day.

$T_f$  amount means the days free from work: Sundays, holidays, Saturdays or the working time whiled away on this day of the week. The result of the subtraction between  $T_c$  and  $T_f$  is called the nominal time ( $T_n$ ). The non-working time ( $T_{n-w}$ ) was subtracted from  $T_n$ . And  $T_{n-w}$  includes holiday, maternity and occasional leaves and sick leaves caused by a worker's or a member's of his family sickness, time of business trip, e.g. to attend professional improvement courses We also included in  $T_{n-w}$  the time of unjustified absence at work, which was not found in the studied population. The result of the subtraction between  $T_n$  and  $T_{n-w}$  is called the disposal time ( $T_d$ ) because this is the very time when the nurse can be disposed by the employing institution. We added the overtime ( $T_o$ ) that means the hours of extra work, to the amount of  $T_d$  and the sum was divided by the number of days patients stay at the ward. In this way we obtained the amount of real working time of a nurse falling per one patient for 24 hrs.

## RESULTS OF THE STUDIES AND DISCUSSION

In 1981 the free time ( $T_f$ ) of the nurse figured 97 days and in 1982  $T_f$  of a nurse employed in one shift was the same as in the previous year while of a nurse employed in three shifts it was 109 days. The average value of  $T_f$  for two years figured 101.4 days. The non-working time for one nurse ranged from 30.7 to 51.1 days in particular types of hospitals and the average value was 43.3 days (Table 1). The value of disposal working time and the overtime (which was very short — about 2% of  $T_d$ ) in relation to one hospitalized patient was on the average 2.48 hrs per 24 hrs. Taking into consideration this value we calculated that one nurse took care of nearly ten patients (9.68 on the average) of all shifts in cardiological care units participating in the research studies where the intensive cardiological care beds constituted 13.4%.

Table 1. The amount of disposal working time and overtime of nurses  $T_d+T_o$ , expressed in hours, falling to one attended patient in cardiological care unit in 24 hrs

Type of hospital	Number of beds		Number of nurses**	$T_{n-w}$ days	$T_d$ days	$C_n\%$	$T_d+T_o$ /hrs/ 1 patient/day
	ICCU*	Ward					
Set of H.C.	8	-	9.0	30.7	237.3	88.5	---
Joint Prov.	18	113	62.5	35.4	224.8	86.4	2.70
Departmental	8	54	37.3	41.1	220.2	84.3	3.36*
Clinical	25	213	87.3	51.1	215.3	80.8	2.12
Total	59	330	196.1				
$\bar{x}$				43.3	220.3	83.6	2.48

\* Intensive cardiological care unit.

\*\* Average nursing staffing per year.

The coefficient  $C_n=(T_d \times 100) : T_n$  attests the utilization of nominal working time. This coefficient was the highest in intensive care units of the Set of Health Care hospitals and the lowest in clinical hospitals and the average value figured 83.6%. Thus we can conclude that every nurse regardless whether she was employed in one shift, two shifts or three shifts, worked on the average 220.3 days i.e. 60.4% of  $T_c$ ; the average value of  $T_d$  was 1762 hrs. The data presented by West German Chief Central Statistical Office recorded that a citizen of Japan works 2096 hrs, of Switzerland — 1966 hrs, of USA — 1904 hrs, of West Germany — 1768 hrs, of Belgium — 1748 hrs (quoted acc. to 7).

The sum of the values  $T_d+T_o$  falling to one hospitalized patient during 24 hrs is not directly connected with the type of a hospital as it might be assumed from the data included in the last column of Table 1. While interpreting the data we must take into consideration the size of

intensive cardiological care units. The number of beds at intensive cardiological care units of clinical hospitals was the lowest and figured 11.7%, in departmental hospitals it was higher — 14.8% and in provincial hospitals it was the highest — 15.9% in the units where the studies were carried out.

The fact that a nurse takes care of ten patients during her shift indicates the rate of her loading with work. It is difficult, however, to estimate the obtained value explicitly because it can be compared neither with properly settled norms nor with the results of other research studies. We have found no reports dealing with this subject in Polish literature. The only publication from 1960 notifies that the number of working hours of a nurse falling per one bed in three American non-federal hospitals organized according to the principles of progressive care was: in intensive care wards — 4.6 hrs, in moderate care 2.5 hrs and in terminal care — 2.7 hrs (1).

### Conclusion

1. Generally applied in Poland rate of number of beds falling per one employed nurse is not reliable because it expresses neither free time and non-working time nor the number of attended patients and utilization of beds. We can get much more information thanks to the disposal time rate of nurses falling to a hospitalized patient in 24 hrs time.

2. In order to plan efficiently, to arrange sensibly the nursing staff and to guarantee necessary care to a patient we have to estimate the need for nursing care in different medical specializations expressed by the amount of time necessary for the execution of this care.

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#### STRESZCZENIE

Na podstawie analizy dokumentacji dotyczącej czasu pracy 196 pielęgniarek, zatrudnionych w jednostkach intensywnej opieki kardiologicznej i oddziałach kardiologicznych w 4 typach szpitali, stwierdzono, że w okresie 2 lat, tj. r. 1981 i r. 1982 średnia wartość czasu wolnego ( $T_f$ ) wynosiła 101,4 dnia rocznie, czasu nie przepracowanego ( $T_{n-w}$ ) — 43,3 dnia w roku, współczynnik wykorzystania czasu nominalnego ( $T_n$ ) — 83,6%. W wymienionych jednostkach organizacyjnych na 1 pacjenta przypadało na dobę średnio 2,48 godz. czasu dyspozycyjnego ( $T_d$ ), łącznie z czasem ponadwymiarowym ( $T_o$ ) pielęgniarek, co oznacza, że każda pielęgniarka opiekowała się prawie 10 pacjentami (9,68), średnio dla wszystkich dyżurów.

#### РЕЗЮМЕ

На основании анализа документации касающейся рабочего времени 196 медсестёр работающих в пунктах интенсивного кардиологического наблюдения и в кардиологических отделениях 4-х типов больниц установлено, что в течение 2-х лет, т.е. 1981 и 1982 гг. в среднем свободное время ( $T_f$ ) равнялось 101,4 дня в год, не проработанное ( $T_{n-w}$ ) — 43,3 дня в год, коэффициент использования номинального времени ( $T_n$ ) — 83,6 %. В вышеуказанных организационных пунктах на 1 пациента в сутки приходилось в среднем 2,48 часа времени имеющегося в распоряжении ( $T_d$ ) вместе со сверхурочным временем ( $T_o$ ) медсестёр, это обозначает, что каждая медсестра обслуживала почти 10 пациентов (9,68), в среднем на всех дежурствах.

