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Work Redesign and the Balance of Control Within a Nursing Context

E. Molleman¹,³ and A. Van Knippenberg²

Within the nursing organization of four hospital wards, a new work design was introduced, which was primarily characterized by the delegation of responsibilities from head nurses to nurses and by the participation of patients. First, it was hypothesized that the participation of patients in health care would enhance their perception of both their own and the nurses' control over their stay in the hospital. Second, it was hypothesized that, in the perceptions of head nurses, nurses, and doctors, the new work design would enhance the perceived control of nurses and reduce the perceived control of head nurses over nursing care. Over 1000 patients, nurses, head nurses, and doctors completed questionnaires. The data support the hypotheses and the results are discussed in terms of participation and decentralization effects of work design changes. It was further observed that doctors evaluated some practical aspects of the new work design negatively, but measures have been taken to overcome these problems. Some organizational and management implications are briefly discussed.

KEY WORDS: work redesign; balance of control.

INTRODUCTION

The present study discusses some of the effects of the introduction of a new nursing model in a hospital. This introduction of a new work design has a twofold background. Partly it originates from the changing demands patients make with respect to the quality of health care and partly it evolved from advances in the nursing profession. These origins will be briefly discussed. Next, the two core characteristics of the new work design

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will be specified. In the final part of this section, the effects of the new work design on nursing will be elaborated theoretically. With regard to these effects, we will focus on the distribution of perceived control within the primary processes of health care.

Since the 1980s there has been a general trend towards consumers demanding more quality, and desiring goods made to measure. Organizations need more flexibility to respond adequately to the growing dynamics of consumer behavior (e.g., Mintzberg, 1979; Morgan, 1986). In service and health care settings, quality has been more and more related to a client-centered approach, in which individual workers provide a wide range of services for a limited number of clients. Conversely, individual clients need to address their wishes or complaints only to one single employee. Such an approach requires a revision of work design.

The growing stream of new technologies into hospitals, as well as the extensive growth of the medical sciences, have changed the content of nursing radically. In addition changes in nursing education have influenced nurses' attitudes toward the objectives and the organization of their work. In the past decade, a shift may be noticed from hospital-based training programs to higher education within the structure of the general education system, including the academic level (e.g., Gibbs & Rush, 1987). Moreover, because of more general changes in society, such as the democratic movement and the women's liberation movement, the position of nurses has been strengthened. These developments have contributed to the demand among nurses for new ways of organizing their work.

The new work design studied is called "integrated nursing." This nursing system, quite akin to the system of "primary nursing," is mainly characterized by two elements, "patient allocation" and "the nursing process" (cf. Grypdonck, Koene, & Rodenbach, 1979). Patient allocation refers to the assignment of individual patients to nurses; each nurse is given responsibility for a small number of patients and provides a wide range of services to them (Marks-Marlan, 1978). In traditional systems, specific tasks are allocated to nurses daily. Under these circumstances, individual workers command only a small segment of the production process, are dependent on the speed at which colleagues deal with their tasks, and are often unable to notice and redress lack of quality of the work that has been done. In wards where the care delivered to a patient was divided among several nurses, Plumpton (1978, p. 417), for example, observed that: "Time and effort on the part of the nurses were repeatedly wasted as no one was sure who had done what; jobs were re-done or re-checked by perhaps two or more anxious, conscientious nurses, while other essential items were overlooked because it was no-one's specific responsibility . . .."
The nursing process, the second core characteristic of integrated nursing, is a systematic approach to nursing care and it consists of several steps, which are passed through systematically. In consultation with the patient, the patient's needs are assessed, care objectives are formulated, actions are planned, executed, and evaluated.

Traditionally, hospitals have a predominantly “product-oriented” structure. In a product-oriented organization, units or groups of workers handle a limited number of similar “products.” Each nursing unit only takes care of a group of patients, which is rather homogeneous with respect to diagnosis and treatment. Within a product-oriented organizational structure, tasks and responsibilities can be divided among workers in several ways. The division of labor affects the quality of working life, in terms of objective core job dimensions as defined by Hackman and Oldham (1980), such as “task identity,” “task significance,” and “the level of autonomy.” The model studied here aims at minimizing the division of labor within the primary process of nursing. The implementation of the model of “integrating nursing” is accompanied by elements of job enlargement (e.g., more communication with the patient’s family, and more mutual adjustment between nurse and physician) as well as by elements of job enrichment (e.g., the planning and evaluation of nursing care activities). Particularly sociotechnical systems theory has emphasized minimizing the division of labor within a product-oriented organizational structure, in order to increase the control capacity of the workers and to enhance the quality of working life (cf. Emery, 1982; Cherns, 1987). The introduction of a sociotechnical system entails decentralization of control capacity within the labour organization. When the “integrated nursing” work design is introduced, control will be transferred to lower hierarchical levels. We will now first discuss the impact of the introduction of the new work design on the position of the patient. Thereafter we will consider the implications for nurses.

With respect to the position of the patient, Taylor (1979) argues that hospitals usually create a depersonalizing environment in which patients learn that a passive role is most appropriate. She suggests that patients learn that they have no control over the way they are treated and over the outcome of their treatment. The expectation that responses and outcomes are unrelated may give rise to motivational, emotional, and behavioral deficits. Taylor argues that these risks can be reduced if the patient is allowed to play a more participatory role. Several studies have been conducted that seem to support this view (e.g., Schulz, 1976; Rodin & Lange, 1977; Raps, Peterson, Jonas, & Seligman, 1982). Patient allocation implies that patients will interact with one particular nurse only. This will create an improved climate for communication. In addition, the adoption of the so-called “nursing process” will stimulate patient–nurse interaction, because patients will be actively involved in the assessment of needs, planning of actions, and
execution of care. Moreover, nursing research and nursing theories have introduced new objectives for nursing care (cf. Berry & Metcalf, 1986). A case in point is the self-care theory developed by Orem (1985). She defines self-care as "the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being" (p. 35). In her model, the goal of nursing is to help people to meet their own self-care demands. Patients are stimulated to participate in health care so they will learn that health problems should be solved not only by doctors and nurses, but that the patient should contribute to it as much as possible. Thus, patients may learn to increase the amount of own control on their health care. Because integrated nursing includes enhancement of patient involvement and participation in care, we expect that, under conditions of integrated nursing, patients will perceive themselves as having more control over their stay in hospital and the way they are nursed than in traditional hospital settings (hypothesis 1a).

Patient allocation and the application of the nursing process means that a patient will communicate more with fewer nurses. In the line of reasoning of Emerson (1962) and Michener and Suchner (1972), the nurse–patient relation will be intensified and therefore patients under the conditions of the new work design will perceive nurses as having more control over their care than in traditional hospital settings (hypothesis 1b).

Thus, the new design is hypothesized to increase the patients' perceived control of patients themselves and of nurses over their stay in hospital. In other words, within the patient–nurse relationship as perceived by the patient, the total amount of control will be larger in an integrated nursing system than in the traditional way of nursing. This idea of enhanced mutual control fits in with views developed by Tannenbaum (1966) and Tannenbaum, Kavcic, Rosner, Vianello, and Wieser (1974), who found in their studies on participation in industrial settings that mutual power and control may be intensified. For this phenomenon, they coined the expression "expandable pie," that is, control is not necessarily a constant commodity, but may grow as the interdependence relationship intensifies.

With respect to the nursing profession, we assume that the introduction of the work design will lead to a shift of control within this discipline. In the literature concerning power and control in organizational settings, numerous definitions and operationalizations of power and control are used (cf. Tannenbaum, 1966; Ng, 1980; Pfeffer, 1981). In the present context we suppose that individual nurses, instead of the head nurse, become responsible for nursing diagnoses, planning, delivering, and evaluating care, as well as for the coordination of nursing and the communication with other professionals. This not only implies that individual nurses will get more control over nursing care and can take decisions on health care matters
more autonomously, but also that head nurses and other health care professionals get more dependent upon nurses for information concerning patients. It is, therefore, hypothesized that, due to the introduction of the new work design, in the perceptions of health care professionals, nurses will get more control over nursing care (hypothesis 3a), will be allowed to make more decisions in primary care (hypothesis 2b), and will be consulted more frequently by other health workers (hypothesis 2c). We thus assume that the new design leads to a shift of control within the nursing profession. Hence, for the position of the head nurse opposite effects may be predicted, i.e., it is hypothesized that in the perceptions of health professionals, head nurses will have less control over nursing care (hypothesis 2a), will be less able to make decisions autonomously (hypothesis 3b) and will be less often consulted by other health care professionals (hypothesis 3c). So, contrary to the hypothesized enlarged overall amount of control in the patient–nurse relationship, we now assume a shift in perceived control from head nurses to nurses, within the confines of a constant amount of control.

In the foregoing we have not discussed the position of doctors. We assume that the new work design will not seriously affect the work of doctors. We predicted that health care professionals (including doctors) will perceive a shift in control within the nursing profession. Moreover, it may be argued (cf. Berger, Conner, & Fisek, 1974) that to establish a new balance of control, it will be essential that this new equilibrium will be evaluated positively by powerful persons within the health care setting, who in this context are primarily physicians. As an explorative part of this study we will, therefore, also examine their evaluations of the change of work design.

**METHOD**

**Design**

The new work design was introduced into four wards of the Groningen University Hospital. The four experimental wards consisted of two surgical units and two gynecological units. Each of these units has about 25 beds available. Wards could only be selected as an experimental unit if the head nurse and her or his team were willing to participate. These experimental wards were compared with some control wards. From the set of control wards available, those wards were selected that matched experimental wards on relevant criteria, e.g., similar diagnosis-related groups of patients and comparable nurses' mean level of expertise and seniority. Three units were found within the same surgical and gynecological clinics, two wards were selected from the internal medicine clinic, and two units
were selected from a surgical and gynecological clinic in another university hospital (Utrecht).

After the units were selected, the nursing model was introduced into the experimental units. During the introduction period, each experimental unit was supported for 8 hours a week by a staff nurse. In the first months the staff nurse informed all the personnel working for these units and they helped to develop a new nursing record and new organizational instruments such as an adjusted rota system and revised job descriptions. In the next phase they trained nurses in using the steps of the nursing process adequately (e.g., trained in assessment of care needs and planning individual patient's care), in self-care theory, and in social skills to strengthen the communicative abilities during interactions with physicians and patients.

During this first period of about 6 months, instrument were constructed to measure the relevant variables. The first data were gathered about half a year after the start of the implementation of the innovation. Considering the above-mentioned implementation steps, it seems reasonable to expect that after the first period, the intended differences between the experimental and control units could be regarded as being established. Personnel was questioned three times (after 6, 12, and 18 months). As far as patients are concerned, measurements were administered during a 6-week period after 6, 12, and 18 months.

**Subjects**

During the three periods of data collection, nurses filled out 435 questionnaires, 168 in the experimental condition, and 267 in the control condition. The degree of response in both conditions was 74%. The mean age of the nurses in the control condition was 27.2 and in the experimental condition it was 29.1. In both conditions approximately 87% of the nurses were female and the mean level of experience was about 45 months.

Physicians completed 22 questionnaires in the experimental condition, and 48 in the control units. Head nurses and their deputies completed 23 questionnaires in the experimental condition and 34 in the control condition.

Each patient completed two questionnaires: the first one, the first or second day they were admitted to the hospital, and the second one, the day, or the day before, they were discharged. The total number of patients that stayed in one of the experimental or control wards during the three 6-week periods data were collected, was 1627. Patients who stayed 3 days or less were excluded (n = 491). Nurses excluded patients who were physically or mentally unable to participate (n = 130). Other patients (n = 115) were excluded for other reasons such as "illiteracy" or "not mastering the
Dutch language." Eventually, 881 patients were asked to participate in the study and 804 patients completed the first questionnaire. The others indicated that they were not able or not willing to participate. Some were moved to another ward for medical reasons or died during their stay in hospital. Finally 616 patients, 291 from experimental units, and 325 from control units, completed both questionnaires. The mean age of the patients was 44.6, and 37% were male. The mean stay in hospital for these patients was just over 12 days. With regard to these variables, the experimental and control groups do not differ significantly.

Questionnaires

The variables were operationalized in the form of a number of pre-structured items, which were included in printed questionnaires.

Manipulation Checks. As a check for the implementation of the new work design, some questions were formulated to measure the degree to which "patient allocation" and "the nursing process" were introduced. In the questionnaire patients filled out before discharge, they indicated the degree to which they experienced patient allocation by answering four questions: How many nurses took care of you during your stay in hospital?, How many nurses took care of you yesterday?, Was there a specific nurse assigned to you?, Whom did you ask when you needed information concerning your stay in hospital? Nurses responded for each patient to the following question: How many nurses took care of this patient during his or her stay on your ward? The reliability (Cronbach's alpha) of this 5-item scale is .57.

Nurses were asked to answer five questions dealing with the nursing process, e.g., To what extent do you evaluate care in consultation with the patient? and, To what extent do you investigate the demand for care in consultation with the patient? (alpha = .87).

Dependent Measures. Patients answered eight questions about the perceived amount of control they themselves had over their stay in hospital, e.g., To what extent do you control the information you receive about your health condition? Other items refer to "the planning of daily activities," "the planning of diagnostic research," "the time of discharge," "information provided to family," "the way problems are dealt with," "time for physical care," and "the amount of attention paid to care." Also, on the same sort of items, patients rated the amount of control nurses and doctors had, e.g., "to what extent do you believe that nurses (respectively 'doctors') control the information you receive about your health condition?" Thus scales for the patient's perception of control by themselves, nurses, and doctors could be constructed. The reliabilities of these three scales are all above .80. All
items concerned aspects of care which could reasonably be assessed by patients.

The way nurses, head nurses, and doctors perceive the division of control over health care was operationalized in three ways. First, these three groups were asked to fill in six items concerning the amount of control each of these groups had over health care; for example, To what extent do nurses (respectively, "head nurses" and "doctors") control the planning of diagnostic research and treatment? The other items dealt with the following issues: "the information provided to the patient," "the time of discharge," "call in the help of other health care professionals," "the way patient’s problems are managed," and "call in the help of the family doctor after discharge." Second, by means of six questions they indicated if nurses (respectively, "head nurses" and "doctors") could decide autonomously when a patient has to be discharged and could call in the help of respectively "a paramedical professional," "a social-worker," "the family doctor," "other medical disciplines," and "the district-nurse" autonomously. The same items were answered with respect to the requirement to consult nurses (respectively, "head nurses" and "doctors") before a decision could be made. The reliabilities of these nine scales (i.e., "control," "autonomy," and "the requirement to consult," for nurses, head nurses and doctors respectively) were all over .70.

Doctors evaluated the performance of nurses by answering 12 questions (reliability .93). These items refer to topics such as "quality of nursing care," "the way nurses cooperate," "the quality of technical operations," "the ability to work autonomously," and "the way they communicate with patients." Doctors filled out these items for the nursing team as a whole, because most of them were not able to evaluate the performance of each individual nurse.

After the first data collection period, some items were revised, and not all respondents completed the entire questionnaire; consequently, not every analysis pertains to the same number of respondents.

RESULTS

Manipulation Checks

Experimental units showed a higher degree of patient allocation than control units: $F(1,363) = 53.55, p < .001$ with means, respectively, 2.77 and 2.37 (range 1–4). Furthermore, compared to nurses in the control condition, nurses working in an experimental setting utilized the nursing process more intensively: $F(1,414) = 4.59, p < .05$, with means, respectively, 2.79 and 2.98 (range 1–5). Considering these results, we may conclude that the
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experimental units work more according to the new work design than the control units. The two conditions differ strongly with respect to the amount of patient allocation and slightly with respect to the application of the nursing process.

Patients' Perception of Control

After admission and before discharge patients expressed their perceived control of themselves, of nurses and of doctors over their stay in hospital. Since there are varying numbers of missing cases, univariate $F$-tests have been performed, the results of which are presented in Table I.

In hypothesis 1a, it is predicted that under conditions of integrated nursing, patients will perceive themselves as having more control over their stay in hospital and over the way they are nursed. Table I shows that patients in the experimental condition, compared to patients in the control condition, perceive themselves as having only slightly more control over their stay in hospital (main effect Exp/Contr, $p < .1$). Patients in both conditions seem to perceive some more control before discharge than after admission (main effect Adm/Disch). These main effects are, however, qualified by the interaction effect: the perceived increase in control must be attributed exclusively to patients in the experimental condition. The simple main effects show that there is no difference between the two conditions after admission ($F[1,421] = .02$, ns), while the perceptions differ significantly before discharge ($F[1,421] = 8.20$, $p < .01$). In other words, after admission, patients in both conditions experience the same amount of control over their stay in hospital, but before discharge patients in the experimental condition perceive an increased amount of control, while pa-

Table I. Patients' Perceived Amount of Control over Their Stay in Hospital by the Patient Him/Herself, Nurses, and Doctors for Experimental and Control Conditions (Exp/Contr), After Admission and Before Discharge (Adm/Disch)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Source</th>
<th>$F$</th>
<th>$df$</th>
<th>$p &lt;$</th>
<th>Exp</th>
<th>Contr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
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<td>1,421</td>
<td>.09</td>
<td>2.67</td>
<td>2.65</td>
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<td>1,421</td>
<td>.05</td>
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<td>2.63</td>
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<tr>
<td></td>
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<td>2.86</td>
<td>2.63</td>
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<td>.01</td>
<td>2.65</td>
<td>2.63</td>
</tr>
<tr>
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<td>Adm/disch</td>
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<td>ns</td>
<td>2.74</td>
<td>2.74</td>
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<td>.08</td>
<td>2.80</td>
<td>2.80</td>
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<td>2.74</td>
<td>2.74</td>
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<td>1,455</td>
<td>ns</td>
<td>3.38</td>
<td>3.32</td>
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</table>
tients in the control condition still perceive the same amount of control (Fig. 1). These results support hypothesis 1a.

In hypothesis 1b it was predicted that patients under the conditions of the new work design will perceive nurses to have more control over their care. From Table I it can be seen that patients in the experimental condition attribute more control over their stay in hospital to nurses than patients in the control condition do (main effect Exp/Contr). Considering the interaction effect and simple main effects, we may conclude that this difference is stronger before discharge than after admission (respectively, $F[1,461] = 11.96, p < .001$ and $F[1,461] = 2.92, p = .09$). These effects support hypothesis 1b.

We suggested that it follows from hypothesis 1a and 1b that, within the patient–nurse relationship, patients will perceive an increased overall amount of control, that is, the new work design will increase the patients' perceived control of patients themselves and of nurses over their stay in hospital. To test this idea, we calculated a sum score to reflect the perceived amount of control of patients themselves and nurses over health care. Tests show that patients in the experimental condition perceive the total amount of control over their stay in hospital (by themselves and nurses) to be larger than patients staying in control units: $F(1,452) = 6.02, p < .05$. Moreover we found a significant interaction effect "condition" by "after admission/be-

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**Fig. 1.** Patients' changes in perception of the control of the patient, nurses and doctors over patients' stay in hospital (scores "before discharge" minus "after admission" are drawn).
fore discharge” \( (F[1,452] = 7.29, p < .01) \), which suggests that, over time, the perceived overall amount of control increases in the experimental wards \( (F[1,452] = 8.68, p < .01) \), while it remains stable in the control units \( (F[1,452] = .74, \text{ ns}) \).

Besides, the effects for doctors are not statistically significant (Table I and Fig. 1), i.e., the new work design seems to have no influence on patient’s perception of the amount of control doctors have. Moreover, statistical tests show that in both conditions patients assess the doctor’s role as far most prominent in controlling their hospital stay (means for patients, nurses, and doctors are 2.66, 2.86, and 3.34, respectively; doctors vs. nurses: \( t = 15.09, df = 500, p < .001 \); doctors vs. patients: \( t = 17.40, df = 486, p < .001 \)).

### The Perceived Control of Nurses

Three groups of respondents, nurses, head nurses and doctors, indicated to which extent each of them has control over health care, can make decisions autonomously and has to be consulted before decisions can be taken. Three MANOVAs were conducted with the two conditions and the three groups of respondents as between-subjects factors (Table II). In those cases in which multivariate tests are statistically significant, univariate tests will be inspected, first with respect to the impact of the new work design for nurses (hypotheses 2a, 2b, and 2c) and, in the next section, with respect to the impact of the position of head nurses (hypotheses 3a, 3b, and 3c).

With regard to the amount of control nurses have over health care (hypothesis 2a), as perceived by nurses, head nurses, and doctors, we find a significant main effect for “condition” as well as for “respondents.” The test for “condition” shows that respondents in the experimental condition estimate the amount of control of nurses to be higher (2.90) than in the control condition (2.75; \( F[1,494] = 9.35, p < .01 \); scores range from 1 to 5). This result supports hypothesis 2a. The univariate test for “respondents” \( (F[2,494] = 7.24, p < .01) \) demonstrates that—in both conditions—head nurses perceive the amount of control of nurses to be higher than nurses do (3.06 and 2.82; \( t = 2.47, p < .05 \)). Nurses judge it to be higher than doctors (2.82 and 2.54; \( t = 3.01, p < .01 \)).

For the autonomy of nurses we find two significant main effects. Considering the means, the main effect of “condition” shows that in the experimental wards nurse are seen as more autonomous (.43) than in the control condition (.28; \( F[1,541] = 21.75, p < .001 \); scores range from 0 to 1). This result confirms hypothesis 2b. In addition, across conditions nurses and head nurses estimate the level of autonomy of nurses to be higher (.36 and .35) than doctors do (.19; \( F[2,541] = 11.13, p < .001 \)). The contrast
Table II. The Views of Three Groups of Respondents (Resp), Nurses (N<sub>R</sub>), Head Nurses (H<sub>R</sub>) and Doctors (D<sub>R</sub>) from Experimental (Exp) and Control (Contr) Condition, Concerning the Extent to Which Nurses (Nurse), Head Nurses (HeadN) and Doctors (Doctor) Have Control over Health Care (First Analysis), Can Make Decisions Autonomously (Second Analysis) and Have to Be Consulted Before Decisions Can Be Taken (Third Analysis)

<table>
<thead>
<tr>
<th>Source</th>
<th>Multivariate tests</th>
<th>Univariate tests</th>
<th>Variable</th>
<th>F</th>
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<td></td>
<td>F</td>
<td>df</td>
<td>p</td>
<td>F</td>
<td>p &lt;</td>
<td>Exp</td>
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<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td>Nurse</td>
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<td>Doctor</td>
<td>1.53</td>
<td>ns</td>
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<tr>
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<td>Exp/contr by resp</td>
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<td>ns</td>
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<td>6,1074</td>
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between nurses and head nurses is not significant \((t = .28, \text{ ns})\), whereas the scores for head nurses and doctors differ significantly \((t = 3.45, p < .01)\).

With respect to the necessity to consult nurses before decisions can be made, we find two main effects. Again, the univariate test for "condition" shows that in the experimental condition, nurses are perceived as having to be consulted more often (.63) than in the control condition (.45; \(F[1,539] = 40.80, p < .001\); scores range from 0 to 1). This result supports hypothesis 2c. The main effect of respondents shows that across conditions head nurses and nurses assess the necessity to consult nurses to be higher (.58 and .54) than doctors do (.34; \(F[2,539] = 11.15, p < .001\)). The scores of head nurses and nurses do not differ \((t = .77, \text{ ns})\), while the scores of nurses are significantly higher than those of doctors \((t = 5.23, p < .001)\).

The Perceived Control of Head Nurses

In hypothesis 3a we predicted that in the perceptions of health professionals, in the experimental condition, head nurses will have less control over nursing care than in the control condition. We find two significant univariate main effects (Table II). The test for the effect of condition shows that respondents perceive head nurses in the experimental condition to have less control over nursing care (2.61) than in the control condition (2.98; \(F[1,494] = 9.83, p < .01\)). This finding corroborates hypothesis 3b. Besides, the main effect of "respondents" \((F[2,494] = 14.59, p < .001)\) shows that across conditions, head nurses perceive themselves as having more control over nursing care than physicians do (3.32 and 2.86; \(t = 3.41, p < .01\)). With respect to the perceived amount of control of head nurses, doctors and nurses do not differ \((t = 1.06, \text{ ns})\).

With respect to the autonomy of head nurses, Table II shows one univariate main effect of "condition," which indicates that on experimental wards head nurses are seen as being less autonomous than on control units (.26 and .41; \(F[1,541] = 18.95, p < .001\)). This result supports hypothesis 3b.

Finally, Table II shows that on experimental wards head nurses have to be consulted less often (.42) than on control wards (.54; \(F[1,539] = 5.47, p < .05\)). This finding supports hypothesis 3c. With respect to this dependent variable, the main effect of "respondents" shows that across conditions head nurses rate the extent to which head nurses have to be consulted when decisions in nursing care have to be made, to be higher (.62) than doctors and nurses do (.48 and .48; \(F[2,539] = 4.37, p < .05\)). The scores for head nurses and doctors differ \((t = 2.29, p < .05)\), while the contrast between doctors and nurses is not significant \((t = .06, \text{ ns})\).
The results presented above support hypotheses 2 and 3 and show that with respect to the nursing profession the new work design results in a shift of perceived control over health care from head nurses to nurses. The introduction of the new work design does not seem to affect the perceived amount of control of doctors (Table II demonstrates no significant main effects of condition on perceived control of doctors). The interaction effect for "autonomy" shows that doctors judge the level of autonomy of doctors in the experimental condition to be higher (.89) than in the control condition (.71; \( t = 3.26, p < .01 \)), while nurses and head nurses perceive no difference (with simple main effects, respectively, \( t = 1.69, \text{ns} \) and \( t = 1.08, \text{ns} \)).

The data suggest that the new work design results in a shift of control within the discipline of nursing without substantially altering the position of doctors. However, as argued in the introduction section, the new work design brings about a shift of perceived control from head nurses to nurses, presumably without changes in the perceived total amount of control. To explore this idea, we computed separate sum scores for "control," "autonomy," and "consultation." The multivariate test exhibits no significant difference between the two conditions: \( F(3,502) = .74, \text{ns} \). This result suggests that, within the domain of health care professionals, there is no significant increase of the overall amount of perceived control.

It may be worth noting that the general means for "control" show a considerably higher level of perceived control of doctors compared to nurses and head nurses (4.14, 2.81, and 2.83, respectively; \( t = 38.52, df = 507, p < .001 \), and \( t = 35.54, df = 501, p < .001 \)). Moreover the overall means show that, across conditions, all groups of respondents assess the autonomy of doctors to be substantially higher than the autonomy of nurses and head nurses (.78, .34, and .35, respectively; \( t = 30.51, df = 546, p < .001 \), and \( t = 29.34, df = 546, p < .001 \)). Also, but to a weaker extent, the overall means show a higher perceived necessity to consult doctors than to consult nurses or head nurses (.67, .52, and .49, respectively; \( t = 8.19, df = 544, p < .001 \), and \( t = 10.12, df = 544, p < .001 \)). These results demonstrate that, irrespective of the "condition" and "respondents" (including patients as shown before), doctors are perceived as the most powerful agent in the hospital setting. As suggested in the introduction, the viability of the changes in work design may depend on how powerful agents within the health care setting evaluate the new system, specifically the way nurses function in it. Therefore, by way of exploration, we will now examine their judgments.

**Evaluation of the Performance of Nurses**

The performance of nurses on experimental wards is evaluated more negatively by doctors in comparison to the performance of nurses on con-
trol wards ($F[1,433] = 8.89, p < .01; the means are, respectively, 3.46 and 3.89 with range 1–5; see Table IIIa). Because a positive evaluation was considered to be important to establish the new work design on a wider scale, interviews were held among seven physicians working on experimental wards. They indicated that the quality of nursing had not decreased and that the quality of information nurses gave to doctors had even increased. They declared, however, that when visiting patients, they had to spend too much time looking for the nurse who was responsible for a specific patient. In a secondary analysis we find support for this point of view. In Table II it has been shown that in the experimental condition nurses have to be consulted substantially more often. In addition, although there is no significant relationship between the degree to which doctors have to consult nurses and the evaluation of nurses by doctors (Table IIIb), the test for non-parallel regression slopes proves to be significant (Table IIIb). When we enter “the degree of consultation” as a within-cell covariate, the difference between conditions of the evaluation of nurses by doctors disappears (Table IIIc), due to the fact that in the experimental condition we find a negative correlation and in the control condition a positive correlation between the degree to which doctors have to consult nurses and their evaluation of the performance of nurses ($r = -.57$ and $r = .44$, respectively). Although these analyses are correlational, which precludes conclusive causal interpretation, the results substantiate the opinions doctors have expressed during the interviews: for doctors in the experimental condition it takes too much time to acquire information and assistance from nurses when visiting individual patients. The unfavorable evaluation of nurses by doctors can be explained by the amount of time doctors need to spend looking for nurses.

**DISCUSSION**

With respect to the effects of the new work design, we hypothesized that patients would experience more control over their stay in hospital. Furthermore, it was predicted that in the experimental condition patients would perceive nurses to have more control over their stay too. Our results support these expectations. In addition, our data suggest that patients’ perception of the amount of control of doctors seems not to be affected by the new work design.

In the second hypothesis it was stated that the new work design would result in an increased perceived control of nurses over health care. Our results show indeed that in the experimental condition respondents perceive the level of control of nurses over primary care, the extent to which nurses can make decisions autonomously and the necessity to consult nurses be-
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Table III. Analysis of Variance with the Evaluation of the Performance of Nurses by Doctors as Dependent and “Condition” as Independent Variable (a); Analysis of Variance with the Evaluation of the Performance of Nurses as Dependent Variable, the Degree Doctors Have to Consult Nurses as Covariate, “Condition” as Independent Variable and the Interaction Term “Consultation by Condition” to Test for Nonparallelism (b); Analysis of Variance with the Evaluation of the Performance of Nurses as Dependent Variable, “Consultation” as a Within-Cell Covariate and “condition” as Independent Variable (c)

<table>
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<th>Source</th>
<th>F</th>
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<td>(a) Condition</td>
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<td>.01</td>
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<tr>
<td>(b) Consultation</td>
<td>.20</td>
<td>1,41</td>
<td>ns</td>
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<tr>
<td>Condition</td>
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<td>1,41</td>
<td>.01</td>
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<td>.01</td>
</tr>
<tr>
<td>(c) Consultation within condition</td>
<td>9.94</td>
<td>2,41</td>
<td>.001</td>
</tr>
<tr>
<td>Condition</td>
<td>.13</td>
<td>1,41</td>
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fore making decisions to be higher than in the control condition. In our third hypothesis we predicted opposite effects for control exercised by the head nurse. Again, our data support these expectations, i.e., in the perceptions of health professionals, head nurses in experimental wards have less control over nursing care, are less able to make decisions autonomously and are less often consulted by other health care professionals than in the control wards.

Although these results are statistically significant, on average the effects involved do not account for a lot of variance. Due to sample size slightly significant results explain about 2% of the variance (e.g., the patients’ perceived amount of control of themselves over their stay in hospital), while the strongest effects explain about 15% of the variance (e.g., in the case of “the level of patient allocation”). These figures are quite common in field studies because numerous other important sources of variance remain unidentified. This modest proportion of explained variance may be due to the degree to which the new model has been implemented. Although the difference between the two conditions with respect to the level of patient allocation was substantial, the difference between the two conditions with respect to the extent nurses work according to the “nursing process,” proved to be only slightly significant. It seems plausible that the principle of patient allocation particularly results in redistribution of tasks, responsibilities and control within the nursing profession while, as suggested by Berry and Metcalf (1986), the effective involvement of patients in the nursing process may affect the patients’ perceptions of control. The nursing process is supposed to improve the quality
of the patient–nurse interaction, and foster active involvement of patients in their care. In contradistinction to the effective implementation of patient allocation, however, the instalment of patient consultation in care planning and execution, as intended by "the nursing process" component of integrated nursing, seems to have been realized to a much weaker extent. Therefore, it may be argued that the magnitude of the effects on patients' perceived control was considerably smaller than the changes in the perceived control of nurses and head nurses. In other words, we suggest that, if the nursing process had been implemented more fully, the effects on patients might have been more substantial.

With respect to the limited effects on patients' perceptions, some additional explanations may be worth considering. The mean stay in hospital is only about 12 days, during which period the primary focus of concern is on medical treatment. The fact that by far the most control is allocated to doctors underscores this idea. Therefore it seems plausible that the effects of changes in nurses' work design on patients' perception of control will be marginal. In addition, as suggested in the introduction, in more traditional hospital settings patients are expected to experience decrease of control over time and gradually tend to adopt a passive role. However, our findings suggest that such a decrease of patients' control does not seem to occur in our control condition (see Fig. 1).

The new work design seems to increase the patients' perceived control of patients themselves and of nurses over their stay in hospital. Within the confines of the nurse–patient relationship the overall amount of perceived control seems to have grown, which fits in with a participation model of control in organizations (cf. Tannenbaum et al., 1974). Conversely, within the nursing profession, this study shows that the new work design seems to bring about a shift of control from head nurses to nurses, without changing the total amount of perceived control. Thus, with respect to the nursing profession, the decentralization model (reallocation of control without expansion) seems to be applicable.

There seems to be a consensus among nurses, head nurses and doctors about the impact of the new work design on the balance of control. The shift in control, however, is not appreciated by all respondents. Doctors in particular seem to judge some effects as undesirable. For a further introduction of integrated nursing, and the attendant shift of control, it is important that hospital doctors, as the most powerful agents in this setting, evaluate the organizational changes positively. Although the perceived control of doctors has not been affected negatively (see Table II), the data as well as the supplementary interviews suggest that the doctors' skeptical attitude can be explained by their having to waste time looking for nurses. Hence, their resistance seems to be based more on practical concerns than
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on principle ones. With respect to this aspect, they prefer the traditional work design, in which they only have to communicate with head nurses about primary care. Meanwhile, to solve the problem, nurses now wear "teletracers" so they can be contacted when needed. In addition, in some wards the scheduling of doctors' visits had been adopted to overcome these communication problems.

The new work design now has been disseminated to other parts of the hospital. In the process, it appears that the role of the head nurse has changed most dramatically. The decentralization of control over primary health care has reduced the need for direct supervision, but, as a consequence, there is now a growing interest in the development of new ways of controlling the quality of nursing. Furthermore, the new work design seems to reduce nurses' career prospects. This has led to a discussion about the need for alternative career paths for nurses within primary care, for example, in research activities. The impact on management, the implications for careers, and other facets of personnel management deserve further study.

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BIOGRAPHICAL NOTES

ERIC MOLLEMAN finished his studies in 1981 at the Department of Social and Organiza-
tional Psychology of the University of Groningen. From that date till 1990 he conducted
research within a hospital setting. The first years he completed some social-clinical studies,
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personal aspects of physical handicaps and facial deformity. Later on he executed some
research projects concerning organizational behavior and personnel management. One of these
studies resulted in a PhD in 1990. He taught research methodology and data analyses for
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social cognition. Previously, he has published on social identity, and on intergroup relations.