

RESEARCH REPORTS

Productivity among Nurses and Midwives in Botswana

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Background

In spite of the rapid economic growth, which made Botswana the envy of sub-Saharan Africa during the 1980s and 1990s, total factor productivity either stagnated or declined over the same period (Botswana National Productivity Centre, 1997). The performance of the public service in the implementation of policies had become a matter of concern, and the reform of the public service and the transformation of its mind-set were major challenges to the nation. Productivity improvement was seen as an important strategy for improving the standard of living and achieving sustainable economic diversification and growth in the long term (Botswana Government, 1991, 1997).

The Research Problem

There is an information vacuum regarding productivity in Botswana in general and productivity among nurses in particular. Hindrances to productivity have been suggested, but neither the Botswana National Productivity Centre nor other research institutions appear to know what the most important hindrances to productivity are (Botswana National Productivity Centre, 1997:5). There is, therefore, a need for systematic studies of productivity in different sectors of the economy in Botswana.

There has been, over the years, widespread concern about the performance of nurses and the quality of nursing services in general (Mothobi, 1982; Owuor-Omondi and Kobue, 1993). The debate about the productivity and quality of nursing services has continued unabated among the general public, in the local newspapers and even in Parliament (Fako and Forchheh, 2000). The success of the Botswana Primary Health Care system falls squarely on nurses' shoulders. The importance of the nurse in primary health care stems from the fact that nurses form the core of reliable permanent staff particularly for maternal child health and family planning (MCH/FP). They account for over 60 per cent of the total trained health personnel in Botswana (Botswana Government, 1997) and are responsible for an estimated 314 health posts and 689 mobile stops nation-wide (United Nations Development Report, 1998). In these remote health facilities nurses are expected to do everything in maternal health, child health, family planning, health education and dispensing of medication (Akinsola and Ncube, 2000).

This study is concerned with the productivity of nurses working within the Primary Health Care System, under the control of the Ministry of Local Government in Botswana. The study establishes the nature, strength and direction of associations between productivity and background variables, work context variables, resources variables, recognition and support variables.

Measurement of Variables

In this study productivity is an aggregate measure of the frequency (rate) with which the nurse performs a set of routine activities, and the number (quantity) of such routine activities that she performs. This measure of productivity is concerned with the rate at which services are delivered, and the amount of services delivered compared with the time needed to deliver them.

A productivity index was computed for each nurse based on her indication of how often she conducted each of 32 routine nursing activities that make up the list of routine activities in three key areas of nursing practice consisting of five (5) routine clinical activities, eleven (11) routine antenatal activities and sixteen (16) routine postnatal activities. The five clinical activities included the following: treatment of nutritional deficiencies in pre-natal mothers; assisting in institutional deliveries; assisting in home deliveries; carrying out thorough physical antenatal examinations; and administering infant immunisations. The 11 antenatal activities included the following: educating fathers on the birth process; providing information on blood pressure; educating prenatal mothers on nutrition; educating prenatal mothers on personal hygiene; educating prenatal mothers on the process of birth; demonstrating prenatal exercises to expectant women; giving prenatal mothers time to ask questions; ordering tetanus toxoid for prenatal mothers; providing family planning education to men; discussing different types of contraceptives with clients; and attending to teenagers.

The 16 postnatal activities included visiting new mothers in their homes during the first week after delivery; providing information on breast feeding to mothers who have recently delivered; providing information on nutrition to mothers who have recently delivered; providing information on personal hygiene to mothers who have recently delivered; providing information on suitable contraceptive methods to mothers who have recently delivered; providing information on symptoms of childhood diseases to mothers who have recently delivered; advising mothers on the general assessment of baby's health; advising mothers about birth registration; providing information on child spacing to fathers; providing information on breast problems; providing information on perennial problems; providing information on anaemia; providing information on involution of the uterus; educating mothers about the need to boil drinking water; providing information on appropriate weaning of the child; and educating mothers on the importance of attending the under-fives clinic.

For each of the 32 items a nurse was asked to choose only one of the following predetermined responses: 'most of the time'; 'some times'; 'rarely'; or 'never'. These four responses were assigned scores of 3, 2, 1 and 0 respectively. The aggregate productivity score on the 32 items was standardised so that it ranged from zero (0) to 100. A score of 100 indicates that the nurse was involved in each of the 32 activities most of the time, while a score of zero (0) indicates that the nurse was never involved in any of the activities. A nurse who might have been involved in a few activities most of the time, but hardly ever got involved in all other activities would have a relatively low score, indicating a general low level of overall productivity. Similarly, a nurse who only occasionally got involved in some or all of the activities would also have a relatively low score.

Data Analysis

The relationship between the level of productivity among nurses and several independent variables was examined. Statistical analyses of the data explored the effects of individual background factors, type of health facility, adequacy of resources, recognition and support from supervisors, etc., on productivity. Analysis of variance (ANOVA) and independent sample t-tests techniques were used to assess the relationship between productivity and qualitative factors.

Findings

Level of Productivity among Nurses

In all, 324 nurses, who worked mainly in clinics without a maternity ward (154), clinics with a maternity ward (96), health posts (61), and a few (13) who worked in primary hospitals, responded to items that were used in the calcula-

tion of nurses' productivity. The mean productivity score for the sample was 69.5 with a standard error of 0.92 and a median of 72.9. Only 11.1 percent of nurses had an aggregate score below 50 percent. On the other hand, 29.3 percent of nurses had a score of 80 percent or higher. Half of the nurses scored between 60 percent and 80 percent. The results indicate that the level of productivity as measured by nurses' involvement in routine nursing activities in Botswana was generally high.

Nine of the 42 variables investigated were found to be highly associated with productivity among nurses. Six other variables were found to be moderately associated with productivity, while three variables showed a weak association with productivity among the nurses. None of the remaining 24 variables explored had a significant relationship with nurses' productivity.

Productivity and Professional Training

Analysis of variance results indicated that there was a highly significant relationship between professional training and level of productivity. A pair-wise comparison of means using the least significant difference (LSD) statistic showed that enrolled nurse-midwives were significantly more productive than any other category of nurse.

Productivity and Midwifery Training

There was a highly significant positive relationship between midwifery training and productivity among the nurses. Nurses trained in midwifery were more productive (mean score = 76.1) than nurses without midwifery training (mean score = 66.3). Midwifery training should afford nurses more knowledge and understanding of issues concerning childbirth. It should give nurses greater confidence on matters pertaining to clinical, antenatal and postnatal care.

Productivity and Attendance of the Mehary Training Programme

Nurses who had attended the Mehary training programme were significantly more productive than nurses who had not attended the programme. The mean score for nurses who attended the programme was 76.9 compared with a mean of 67.5 for those who had not attended the programme. Nurses who had attended the Mehary training program obtained one of the highest mean scores compared to any other professional cohort in the study.

Productivity and Ability to Complete the Botswana Obstetric Record

There was a very strong positive association between nurses' ability to complete the Botswana Obstetric Record and productivity. The more comfortable a nurse was in completing the Botswana Obstetric Record, the more productive she appeared to be.

Productivity and Attendance of Village Health Committee Meetings

Nurses who did not attend any Village Health Committee (VHC) meetings were significantly less productive than those who attended one or more VHC meetings. The mean level of productivity among nurses who did not attend any meeting was 65.3 compared with means of 72.4, 72.2 and 75.3 for nurses who attended one, two and three or more VHC meetings respectively. The differences in the mean levels of productivity of nurses who attended one, two and three or more meetings were, however, not significantly different ($p > 0.30$ in all pair-wise comparisons).

Productivity and Number of Village Development Committee Meetings

There was a significant relationship between the number of Village Development Committee (VDC) meetings that a nurse attended per month and productivity. The significant difference was between nurses who did not attend VDC meetings and those who attended one or more meetings per month.

Productivity and Reliance on Peers and Supervisors

There was a significant relationship between peer reliance and nurses productivity. Nurses who always relied on peers for information were the most productive (mean = 74.9), followed by nurses who rarely relied on peers (mean=70.2), while nurses who only sometimes relied on peers for information were the least productive (mean = 66.8). Reliance on supervisors had essentially the same impact on productivity, as did reliance on peers. For example, nurses who always learned from superiors were the most productive (mean = 75.0), followed by nurses who rarely relied on supervisors (mean=69.8) and nurses who only sometimes relied on peers (mean = 67.5). For both factors, very dependent nurses did not differ significantly from very independent nurses.

Productivity and Participation in Making Policies

Participation in making maternal child health and family planning (MCH/FP) policies was found to be positively and significantly related to nurses productivity. Nurses who always participated in making MCH/FP policies were the most productive, (mean = 74.5), followed by nurses who only sometimes participated (mean = 72.0) while nurses who rarely participated in MCH/FP policies were the least productive (mean = 67.3).

Productivity and Workload

Workload was moderately related to nurses productivity. Nurses who reported a heavy workload had a higher mean productivity score (71.1) than those that reported a reasonable workload (mean score = 66.7).

Productivity and Perception of Health after Posting

The relationship between perception of health after posting and nurses' productivity was negative, with nurses who perceived good overall health since posting obtaining a mean productivity score of 67.1 compared with means of 69.9 and 74.0 for nurses who perceived fair and poor overall health respectively.

Productivity and Involvement in the Community

A positive relationship was observed between productivity and involved with the community. Nurses who were involved in the community had an average productivity score of 71.4 compared with 67.2 obtained by nurses who were not involved in the community.

Productivity and In-Service Training

The relative level of in-service training was moderately related to productivity. Nurses who had not been to any form of in-service training in the previous six months were significantly less productive (mean = 63.7) than nurses who had been to one or more in-service training activities. The differences between nurses who had been to a few (mean = 71.1), to a reasonable number (mean = 69.7) or to many in-service (mean = 71.3) training activities were not statistically significant.

Productivity and Age

The age of a nurse was moderately related to the nurse's level of productivity. The most productive nurses were those in the 35-44 age group who had a mean score of 74.0. These were followed by nurses in the 30-34 age group with a mean of 72.4, nurses aged 45 years and over (mean = 71.1), nurses aged 25-29 (mean = 66.9) and the very young nurses aged 20-24 with the lowest productivity scores (mean = 64.9).

Productivity and Religious Affiliation

There were moderate differences between the level of productivity of nurses with different religious affiliations. Nurses affiliating to missionary Christian churches (Roman Catholic, Anglican, Methodist, etc.) with a mean score of 72.5, were significantly more productive than nurses from minority religions (Islam, Indigenous African religion, etc) with a mean score of 66.7. Nurses affiliating to missionary Christian churches were also slightly more productive than nurses who belonged to independent African churches (mean = 68.3).

Productivity, Type of Health Facility and Preferred Work Setting

The type of health facility in which the nurses worked and the type facility in which they preferred to work were both weakly associated with nurses' productivity. Nurses who worked in clinics with a maternity ward were the most productive (mean = 72.7), followed by nurses who worked in health posts (mean = 69.9), then nurses who worked in clinics without a maternity ward (mean = 67.9) and lastly, nurses who worked in hospitals (mean = 63.5).

Productivity and Other Variables

It was interesting to note that a nurse's productivity was not dependent on whether or not she was satisfied with her job, income or workstation. Similarly, perceived inadequacies of equipment, transport and telecommunications facilities were not significantly related to productivity.

Discussion

With half of the nurses scoring between 60 and 80 percent, this study has found that the level of productivity as measured by nurses performance of routine clinical, antenatal and postnatal nursing activities was reasonably high in Botswana. While education has been found to be a good predictor of productivity (Uri, 1982; van de Gaag and Vijverberg, 1989) this study has shown that the most productive nurses are not necessarily those with the highest levels of education. Nurses with lower basic academic qualifications (enrolled nurses) were more productive than were those with higher basic academic qualifications (registered nurses). Enrolled nurse midwives were also more productive than were registered nurse midwives.

Midwifery training appeared to be one of the most important determining factors in productivity among nurses. The mean productivity score for midwives was more than 10 percentage points above the mean productivity score for non-midwife nurses. As a result of their training, midwives should have more knowledge and understanding of issues concerning pregnancy, labour and childbirth than should non-midwife nurses. This knowledge should enable them to approach clinical, antenatal and postnatal care with more confidence than non-midwives.

It is not surprising that there should be a strong positive association between a nurse's ability to complete the Botswana Obstetric Record and her level of productivity. When taken together with the positive effect of midwifery training, the finding suggests that productivity in routine clinical, antenatal and postnatal health care is significantly linked with the type of training received, and the competence of a nurse.

This study found that nurses who did not attend any form of in-service training for a prolonged period of time were significantly less productive than nurses who attend some form of in-service training. This is consistent with

studies of Dean et al (1978) and Wiseman and Page (1983), which have found that alternating work and study periods exposes people to innovative ideas during their study and gives them greater confidence thereby raising their level of performance. In-service training exposes a nurse to modern nursing methods and new approaches approved by nursing and health authorities. Attendance of, and participation in in-service training activities should also accord a nurse the feeling of being professionally involved, which should give her the motivation to participate more fully in routine functions.

Attendance of Village Health Committee (VHC) and Village Development Committee (VDC) meetings appeared to have a positive impact on a nurse's productivity. However, attending several VHC or VDC meetings in a short period of time, did not lead to any more increase in productivity than attending one or two meetings. Attendance of VHC and VDC meetings is perhaps an indication that the nurse identifies with the community in which they work. Such nurses are perhaps very committed to their community and hence their jobs and would more likely sacrifice personal time at work to attend to their patients, thereby making them more productive than nurses who do not identify with the community. It could also be that nurses who attend VDC or VHC meetings are aware of the concerns of the community and criticisms levied at nurses, and hence understand the need to be more involved with their work.

The negative relationship between productivity and workload suggests that the relationship is co-relational rather than causal. That is, a nurse who is highly productive should feel a sense of a heavy workload, whereas a nurse who is unproductive may not know what all the fuss (of a heavy workload) is about. This interpretation is supported by the fact that nurses who reportedly experienced staff shortages were no more productive than nurses who did not experience staff shortages. Staff shortages are a reality of the work place as opposed to workload, which is a feeling arising from the work actually done.

A possible explanation of the negative association between overall health and productivity is that a nurse's sense of poor health may simply be an expression of work related stress. Nurses who are highly productive will tend to experience more work-related stress and report this as overall poor health, than nurses who are not so productive. Vecchio (1988:377) found that moderate amount of stress can stimulate individuals to work harder and accomplish more. However, when stress levels rise too high, employee performance is impaired.

The finding in this study that nurses in the 30-44 years age group were the most productive, suggests that this cohort has acquired sufficient experience in the job, and still has the necessary energy to do the job well. Older nurses on the other hand are getting tired, while younger ones are still not sufficiently experienced to be fully involved in the range of activities to score high on the productivity scale. The study found that the level of productivity of the youngest (under 30 years) and the oldest (over 44 years) nurses were very comparable.

This finding is in line with several studies (Gindger et al, 1983; Griffiths, 1997; Kutscher and Walker, 1960; Levin and Stephan, 1989; Rowe, 1988), which have found no relationship between age and productivity. The results of this study suggest that previous studies may have over-aggregated age to the extent that they missed out the important 30-44 years cohort.

Older workers are likely to be good workers due to the experience acquired over the years (Schermerhorn et al, 1995). Such experience provides them with skills that compensate for decline in physical and mental abilities (Meier and Kerr, 1976), and equips them with knowledge, facts and principles that have a substantial impact on job performance (Rowe, 1988; Schmidt et al, 1986; van der Gaag and Vijverberg, 1989; Stukalov, 1982).

This study found that involvement of workers in the decision making process had a positive influence on work performance. Nurses who always participated in making MCH/FP policies were the most productive while nurses who rarely participated in MCH/FP policies were the least productive. Performance enhanced through involvement is derived from the intrinsic human need for recognition approval and status (Haralambos and Holborn, 1990). Involvement of workers in the decision-making process (participative management) saves time, reduces errors, absenteeism, turnover and grievances. It also increases efficiency, improves employee morale and attitude, improves quality of patient care and has led to increased productivity of up to 40 percent in some US companies (Johnson, 1981). An increase in the level of participative activity may also lead to an increase in productivity (Rosenberg, 1980).

This study found a positive relationship between productivity and reliance on supervisors. This finding is consistent with findings by Pincus (1986), Sakai (1992), Schermerhorn et al (1995) and Watson (1983) who have found significant relationships between job performance, communication satisfaction, communication climate, and personal feedback between top management and junior workers. Direct communication between superior and subordinates is crucial for enhancing productivity through developing intimate bonds (Sakai, 1992), while task feedback or knowledge of results motivates people towards higher performance by encouraging the setting of higher performance goals (Schermerhorn et al, 1995). Administrative recognition of employees is one of the major factors that improve worker morale, enhances the quality of worker's performance, and reduces the possibility of staff loss through burnout (Watson, 1983).

The study found a positive relationship between productivity and reliance on peers. Small groups of employees who meet regularly to discuss and develop solutions to problems encourage employee involvement and increases productivity (Schermerhorn et al, 1995). Team working and group solidarity may also increase job satisfaction and labour productivity (Wright and Edwards, 1998), while work improvement teams may lead to reduced absenteeism and increased productivity (Vecchio 1988:366). Campbell and associates (1990)

concluded that self-managing teams tend to increase group performance. However, some researchers have found that group cohesiveness is only positively related to performance if the group's goals include high performance.

The type of health facility or work setting did not have a strong relationship with productivity. The moderately significant differences among nurses in different types of health facility probably indicates that nurses in hospitals and clinics without maternity to some extent tend to work in specialised units and, hence, may not have the opportunity to be involved in a whole range of nursing activities. On the other hand, nurses who are based in clinics with maternity would have the opportunity to be fully involved in all antenatal and postnatal health activities. Nurses working in health posts will tend to be involved in all aspects of health care as a consequence of working either alone, or with very few colleagues.

An important finding from this study was that the extent of satisfaction or dissatisfaction with the job, salary and workstation were not related to productivity. Similarly, adequacy of equipment, transport and telecommunications as well as consistency of work with training, highest level of basic academic education, income levels and frequency of staff shortages were not related to productivity. These are work-related variables that one would have expected to affect productivity. Young workers who earn less have been found to be passive producers due to job insecurity and a threat of salary cuts (Mironov, 1990), while salary level has been identified as one of the major predictors of job performance among managers of restaurant companies (Summers and Hendrix, 1991). In an analysis of variables conducive to improved performance, Macarov (1982) concluded that paying money on a differential basis serves as an incentive to hard work and improves productivity. This relationship has however, been greatly undermined in social science research (Tausky, 1985; Vecchio, 1988), and is not supported by this study.

Conclusion

On a scale of zero to one hundred, this study found an average Botswana Nurse to be about 70 percent productive as judged by the frequency with which they perform a set of routine activities. Some 11 percent of nurses have a productivity score of less than 50 percent, but this is matched by the almost 30 percent who score 80 percent or more on this scale. Therefore, nurses in Botswana appear to be quite productive in their routine functions. The fact that productivity is not affected by dissatisfaction with salary, job and workstation, perhaps points to the professional manner with which these nurses work. That adequacy of transport facilities and telecommunications should not be related to productivity in this case is not too surprising since most of the routine activities do not require extensive use of transport and telecommunications. It is however, intriguing to find that factors such as adequacy of equipment, consistency of work with training and recognition from superiors do not affect productivity.

The study highlights the importance of midwifery training in the efficient delivery of the Botswana Primary Health Care system. Midwives were found to be the most productive category of nurses in terms of the number of nursing activities that they routinely performed as well as the frequency with which they performed such activities.

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