

Abstract

Background and Objectives: Equity in human resource distribution as the most important of health source has become one of the main concerns of policy makers and planners of health sector in the entire world. One of the strategies for accessing effective human resource distribution is to design and implement workforce estimation Norm. Given nursing staff have a crucial role in quality of patient care and safety of patients and Since salaries and benefits of nurses- as the largest group of professional staff in hospitals- consist the considerable part of hospital Costs, therefore The purpose of this research was to developing of a norm for required nurse estimation for hospital inpatient departments and demand forecasting it for the year of ۲۰۲۱ (Case Study of Mashhad University of Medical Science).

Methods: the mix-method study was conducted from December ۲۰۱۵ to December ۲۰۱۶. In qualitative Part, The data were collected through semi-structure and in-depth interviews by purposive, quota and snowball sampling of participants. Findings were analyzed using the Colaizzi's method and Atlas.ti software version ۶,۰,۱۵. The reliability and validity study were examined and approved using four criteria by Lincoln and Guba. In quantity part, at the first, we used WHO recommended work load Indicator to determine required nurse norm in inpatient wards. The calculations performed in teaching and medical hospitals for ۴۹ inpatient beds. In the second phase, using Ministry of Health and Medical Education SANAB website, we extracted the forecasted beds for Mashhad University of Medical Sciences for ۲۰۲۱, which is adjusted on the basis of patient reception and ۷۵% occupancy rate for each specialty. Then, using designed norm in the first phase of quantitative part, we estimated the needed nurses for hospitals affiliated with Mashhad University of Medical Sciences in ۲۰۲۱.

Results: in qualitative part, ۱۴ subthemes in ۴ themes; inappropriate planning and policymaking in high levels, resource constraints, and poor design of norms and lack of updating the norm as barriers against required nurse estimation norms applying in Iran hospitals and ۱۰ subthemes in ۶ themes occupation analysis, planning and policy making, real

workload, acceptability, nurses' efficiency and being a native as Features required for design of nursing staff estimation norm in hospitals emerged from data analysis. In quantitative part, the needed nurses' estimation norms calculated in 49 inpatient beds in teaching and medical hospitals. The lowest nurse to bed norm for teaching hospitals was for psychiatry, eye surgery, eye plant, respectively and for medical hospitals was for ear, nose and throat, orthopedics and obstetrics and gynecology, respectively. The highest nurse to bed norm for teaching hospitals was for burns ICU, bone marrow transplant and open heart ICU and for medical hospitals was for general ICU, infant ICU and CCU. The final part of the study indicated that 10637 nurses without considering overtime and 8230 with considering overtime is needed for 9478 forecasted inpatient beds of hospitals affiliated with Mashhad University of Medical Sciences in 2021.

Conclusion: The results of present study indicate that many barriers exist in applying norms for required nurse in Iran's hospitals. In addition to considering the present barriers with identifying the required features for designing an appropriate nursing staff estimation norm provide positively base on norm acceptance and implementation. Given that for each inpatient bed obtained a special norm, so it can be concluded that using a same norm can lead to inequitable distribution of nurses between inpatient departments and hospitals. Paying attention to the real work load and also available real time by nurses in designed norm can develops the ground for removal of personal decisions of managers in distribution of nurses which is an efficient strategy for improvement of both applying nursing power and patient care. By attention to the number of estimated nurses for hospitals affiliated with Mashhad university of medical sciences in 2021, it is necessary to perform measures to reduce expected shortcomings including reducing education period of nurses, teaching assistant nurses, increasing the number of admitted students in nursing courses and encouraging non-working nurses to work in hospitals.

Keywords: Estimation, Norm, Nurse, Hospital, Forecasting, Demand



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**Developing of a Norm for Required Nurse Estimation for Hospital
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