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RESEARCH REPORT

The Projected Supply and Demand for Nurses

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The study was funded with the assistance of
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Executive Summary

Over the past decade, the Western world has become increasingly concerned with the nursing workforce[1] due to an anticipated gap between supply and demand.[2] This expectation is based mainly on projections indicating that the demand for the nursing workforce will exceed the supply as a result of an aging population and that the percentage of elderly people requiring assistance will increase. Comprehensive studies examining the nursing workforce supply have been conducted in various Western countries. In Israel, a recent study examined the employment and workforce characteristics and the projected supply of nurses.[3] The current study goes one step further in contributing to planning the nursing workforce in Israel by examining the anticipated demand for nurses.[4]

Study Goals

The study was designed to examine the expected demand for nurses; the expected balance between supply and demand projections; and the implications for planning the nursing workforce in Israel.

Methods

1. Semi-structured in-depth interviews with key figures in the healthcare and nursing care systems
2. Examination of two scenarios for nursing workforce supply projections based on a previous study by Nirel et al. (2010), where the first assumes that nurses remain in the workforce up to age 60, and the second assumes that they remain until age 65.
3. Demand projections for the nursing workforce:
   - The demand projection for nurses was based on several models: a model for the overall demand for nurses in the economy, and two models for the demand of nurses in hospitals (which were then supplemented by a demand projection for nurses in the community to get an overall projection).
   - The projections were for each of the years 2015, 2020, 2025 and 2030.

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[1] The term "nursing workforce" describes a variety of professionals trained to provide nursing care in the healthcare system. This workforce includes registered nurses with a variety of training backgrounds (graduates of 3-year diploma courses, college graduates, and graduates of re-training programs), practical nurses (since 2007, practical nurses are no longer being trained in Israel), and auxiliary staff, most of whom have taken short training courses enabling them to work in hospital wards.

[2] In workforce planning, the term "supply" relates to the available workforce and its characteristics. "Demand" or "requirement" for workforce relates to the workforce required in order to provide health services at the level determined to be desirable.

[3] Nirel, N.; Yair, Y.; Samuel, H.; Riba, S.; Reicher, S. and Toren, O. 2010. ***Registered Nurses in Israel: Workforce Supply – Patterns and Trends***. Myers-JDC-Brookdale Institute, Jerusalem (Hebrew).

[4] The demand for nurses includes all nurses in the workforce, both registered and practical. It is assumed that in 2030, all nurses employed will be registered nurses, given that practical nurses are no longer being trained.

- For the demand projections, the population size was measured in terms of standardized population. Statistically, this was calculated using the capitation formula used for allocating the National Health Insurance Law funds to the health plans. This formula gives differential weights according to age, gender and geographical residence (center or periphery) – variables that affect the consumption of health services.
- In Israel, the size of the nursing workforce in the hospitals and residential facilities is determined by a fixed ratio of nursing positions (nurses and auxiliary staff) per bed, which was determined by a collective agreement between the public employers and the nurses' union in 1997. The agreement stipulates the ratio of nursing positions per bed without distinction between nurses and auxiliary staff. Information on the current mix of nurses and auxiliary staff was then used to calculate the number of positions for nurses alone.
- The data on nurses' positions refer to FTEs (full-time equivalents). In order to convert these data into data on the number of nurses required, the demand for nurses' positions was multiplied by a conversion coefficient, which was calculated separately for hospitals and for the community.

  The following are the models for the demand projections for nurses:

  - Model A: ***Demand projection for total nurses in Israel by the nurse-to-population ratio (per thousand standard capita)***
  - Model B: ***Demand projection for nurses in hospitals by a fixed ratio of number of beds per 1,000 standard population***. To this, we added the demand projection for nurses in the community, based on the ratio of nurses in the community (in the health plans and public health services) to the population, in order to calculate the demand projections for all nurses in the country.
  - Model C: ***Demand projection for nurses in hospitals by utilization*** (projected number of hospitalization days). This model, which is based on Harding's work,[5] assesses the projected utilization of healthcare services by combining patterns of health service utilization (as reflected in the projected increase in the number of hospital days and the number of users) and the projected population increase, by gender, age, and residence in the periphery (standard population). At the same time, the model projects the number of nurse positions that will be required as a function of the current employment density and future employment trends. This projection is based on the staffing positions for nurses according to the nurse-to-bed ratio in hospitals (assuming that each bed has the staffing stipulated in the collective agreement). To this model too, we added to the demand projection for nurses in the community, based on the ratio of nurses in the community (in the health plans and public health services) to the population, in order to calculate the demand projections for all nurses in the country.

[5] Harding, A. 2007. ***Modelling Our Future: Population Ageing, Health and Aged Care***. Chapter 16: "What is behind HRSA's projected supply, demand and shortage of registered nurses?"

4. The examination of the balance between the projected supply and demand for nurses in intervals of 5 years: 2015, 2020, 2025 and 2030 according to two scenarios, which differed regarding the expected nurse retirement age: 60 or 65.

Findings

The examination of the projected supply itself indicates a decline of 4.5% in the number of nurses employed in the profession in the short term (between 2010 and 2015). However, it is expected that by 2030, there will be an increase of 5% from the levels that obtained in 2010, both in the projected number of nurses employed up to age 60 and in the projected number of nurses employed up to age 65.

However, an examination of the balance between the supply and demand projections reveals that based on a scenario of nurses working up to age 60, all three demand projection models anticipate a shortage of nurses in the short term (2015). When examining the gap between supply and demand based on nurses remaining in the workforce to age 65, two of the demand projection models show a balance between supply and demand, and even a surplus of nurses in the near future (2015). Yet, all three demand projection models anticipate a substantial shortage of nurses in the long term, i.e., 2030, whether they remain in the workforce until 60 or 65 (the extent of which varies depending on the model).

Thus, for example, when examining the balance between supply and demand projections according to a fixed ratio of 4.8 nurses to 1,000 standard population (model A), it is anticipated that there will be a gap between the supply and demand of approximately 4,700 nurses by 2015. The gap is projected to grow to 14,190 nurses in 2030. In the case of a nursing workforce that remains active until age 65, the shortage is reduced to 9,500 nurses in 2030.

When examining the balance between the supply and demand projections by a fixed ratio of hospital beds to 1,000 standard population, (model B, above), it was found that in the case of nurses working up to age 60, there would be a shortfall of 4,850 nurses by 2015. The shortage is expected to grow to 15,760 nurses by 2030. The assumption that the nursing workforce remains active until age 65 yields a projected surplus of 630 in 2015, and a shortage of some 11,040 nurses in the long-term (2030).

An examination of the balance between supply and demand projects by utilization (model C) shows an anticipated shortage of some 4,000 nurses up to age 60 throughout the health system in 2015. In 2030, the shortage is expected to be around 10,750 nurses. An examination of the balance between the demand by utilization and the supply of nurses up to age 65 shows that no shortage is expected in 2015, but by 2030, there will be an expected shortage of 6,000 nurses.

All of these models project a significant shortage of nurses in 2030, with the results varying with regard to the extent of the shortage. The models also indicate that the extent of the expected shortage is significantly influenced by assumptions about the ages at which nurses will retire.

The study findings indicate that in order to meet projected demand, the nursing workforce up to age 60 must grow at annual rate of between 2.3% and 3%. At the same time, the annual percentage increase in the required number of employed nurses up to age 65 ranges from 1.5% to 2.2%.

Implications for Workforce Planning Policy

- The health system has been aware of the anticipated shortage of nurses for some time even if, until now, it has not had any agreed-upon data on the extent of the projected shortage. Therefore action has already been taken and many resources are being invested in expanding the training courses for nurses and recruiting the workforce that will be required in the future.
- However, given the projections presented in the study regarding the predicted long-term (2030) shortage, it appears that the current efforts to increase the supply of nurses will not be sufficient and should be expanded.
- Furthermore, given the limited infrastructure and budget and the difficulty recruiting large numbers of nurses to the profession (not only in Israel), it may be that new approaches are needed, such as introducing nurse assistants and/or other new categories of health care professionals in order to attract staff to the various levels of the nursing system.
- Thought must also be given to additional ways and means to keep nurses in the workforce for a greater number of years.
- The advantage of the models that take the structure of the health system into account, particularly the demand model based on utilization, is that their estimated demand does indeed reflect the size of the workforce required to supply the health services in the current system. However, it must be remembered that these are conservative models. For example, despite the advantages of the demand model based on utilization, which takes account of the population increase and the changes in the demographic structure, it is intrinsically based (as is the model based on standard beds per 1,000 population) on the assumption that the structure of the system and the rules of the game will be the same in the future. Therefore, the projections presented in the report are only correct for the given situation, which may change over time.
- It must be taken into account that there could be changes that would affect these supply projections, such as: a large increase in the number of hospital beds; a large expansion of the training courses and recruitment of workforce; new technologies that substantially change the essence of nursing work; changes in the standard ratio of nurses per bed (according to the changes in the complexity of morbidity of patients in hospital wards); the adoption of practical steps to significantly expand the role of nurses in the community; and a significant increase in the number of nurses required to work in the community. If there are changes in the health system, such as these or others, it will be necessary to enter them into the supply projection equations and adjust the projections accordingly.

Conclusion

The current study presents models for the projected demand for nurses including a model based on utilization. The utilization model is appropriate for the health system in Israel in that it takes

account of the projected utilization in the health system according to changes in the population and according to current and projected patterns of employment in the nursing workforce. The study, which provides information about the demand for nurses and the projected balance between supply and demand should streamline the process of long-term strategic planning for the nursing workforce. Moreover, the study findings can be used as the basis for projections to examine the balance between supply and demand, and for workforce planning in other professions in the health system. Indeed, the findings are serving the Ministry of Health in its intensive efforts to address the nursing shortage.

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