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Meeting abstract

From a Belgian Nursing minimum dataset to a nursing cost-weight per DRG

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Introduction

The Belgian hospital financing system is regarded as one of the systems that are adjusting for nursing care. The actual financing system for nursing activity in Belgium consists of a basic and a supplementary part in budget allocation to nursing wards. The supplementary part of nurse staffing financing is allocated over hospitals based on a 1 to 10 deciles ranking of hospitals. For general hospital care the following main criteria drive the ranking system: Firstly, the relative reimbursement value of performed medical interventions as a total of fee for service bills; Secondly, the value of the mean NMDS – weights per patient day as measured by the national Nursing Minimal Data Set.

The mean NMDS – weights, as one of the ranking criteria, are calculated in a complex manner. Multidimensional scaling projects every nursing ward on a national 'map' within a dependent – independent care dimension and a basic – intensive care dimension. Every nursing ward is positioned within one of 28 care zones on the map taking into account this nursing profile differentiation. The process determines 28 clusters of nursing wards. The cluster in which a nursing ward falls has a unique NMDS weight. This weight is an indicator of the zone specific staffing characteristics, as a combination of a staff qualification index and a staff quantification index (FTE/patient day).

The need for change of this system is clear. In 2006 NMDS was thoroughly updated towards a system of 79 nursing intervention items. NMDSII is the result of broad qualitative sector participation and a statistical quantitative reconfiguration of the system. It is up to date with current nursing practice. It is based on NIC as an international nursing intervention 'language'. And it is a much more accurate representation of what nursing care incorporates in all its different dimensions when compared to the previous version of NMDS.

The current system lacks in one very important aspect: the NMDS – weighting as financial driver is based on a historically determined staffing qualification and quantification per care zone. There is no transparent relationship with nursing care needs which result from patient care needs.

The study was therefore aimed at redirecting the supplementary part financing system from actual towards justified staffing needs as a key criterion for resource allocation.

Methods

At first 112 real patient cases have been written, based on patient records from 35 hospitals. Later on these cases are used to assess variability in nursing care needs and to investigate the relationship with staffing needs and thus also financial needs. The case construction is based on real

patient cases, as encountered in Belgian general hospitals. Patient records in combination with additional information from nurses, involved in the specific care delivered, are the basis for case construction. A case describes the whole of nursing care delivered for a specific patient, during one day of stay (24 hours). NMDSI and NMDSII are also coded for each selected patient case. All information is obtained by way of nursing unit visits. Direct record reviewing and continuous contact with involved caregivers ensure the validity of the constructed cases. After case construction, an additional caregiver feedback warrants a genuine description of care as it was rendered in practice.

202 head nurses of 69 general hospitals rated the patient cases. The cases were randomly assigned to the raters. All cases are rated during two consecutive rounds, as part of an adapted Delphi approach. Every head nurse had to rate on average about 10 cases and every case was evaluated on average by 8 nurses.

Three main questions were posed concerning staffing needs: 'How big is the required nurse time need for care delivery as described in the specific patient case to ensure quality of care?', 'Taking into account current level of ward staffing, how many patients with this nursing care profile can one nurse care for?', 'Suppose there would be no limitations on ward staffing, how many patients with this nursing care profile can one nurse care for?'. The different questions allow evaluating internal consistency of the rating procedure.

The response during the whole rating process equals to 92% of expected ratings. A number of alternative staffing needs assessments were calculated to evaluate external consistency: TISS, NARVEL, San Joaquin and AGGIR.

In a second part of the study all NMDSII interventions were rated on time needs separately, independently of any patient case, by 20 randomly selected head nurses. The combination of NMDSII items in each patient case, used in the first method, makes it possible to sum the separate nursing intervention time needs as a result of the second method, to incorporate the whole patient case content. This makes the findings of both methods, patient case based and intervention level based, directly comparable as a measure of criterion validity.

In the analysis of both case and intervention ratings the following rule was applied to adjust for a skewed distribution: If the Shapiro-Wilk normality test showed no significant deviation from normality ($p < 0.05$), the mean was considered a fair measure. Else the Huber robust mean was selected. Estimates were expressed as relative weights. Two other validated nursing workload weighting systems were compared to the constructed relative point system: the use of 'Points_closon' and 'Points_gent'.

Results

The rating of nursing time needs based on patient cases varies from a minimum of 28.38 minutes up to 80 minutes. Internal consistency was high (r between .76 and .97, $p < 0.01$). There is a considerate degree of variability present between ratings.

A very strong relationship exists between the estimated time and the TISS patient classification system regarding intensive care. This confirms previous research. The geriatric AGGIR – estimated time relationship is also strong. However the relationship with San Joaquin for general care is weak and with NARVEL for paediatric care is the relationship non existing.

There is a high correlation ($r = 0.90$, $p < 0.01$) between the sum of nursing weights per intervention and the patient case rating of nursing time.

The correlation between the newly developed nursing weights for NMDS-II and the Closon and Ghent weights for NMDS-I is more than 0.93 ($p < 0.01$).

Discussion and conclusion

Valid, reliable and usable nursing weights per NMDS-intervention have been developed. The nursing weights have been validated by using 112 clinical cases. Both estimate approaches are highly consistent with each other, with NMDSI based systems and with accurate external patient classification systems.

The main conclusion of the study is that it is possible to weight nursing care based on an appropriate staffing level instead of actual staffing levels. The study provides valid, reliable and usable nursing cost-weights for DRGs.

NMDSII has the features of classic patient classification systems, but it is a national and hospital wide system. It is endorsed by sector participation and statistical analysis. And it is a dataset that can be linked to other relevant datasets such as HDDS.

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