Patient Experience with Hospital Care: Examining the Factor Structure, Measurement Invariance, Predictors, and Sources of Variation Using the HCAHPS Survey

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The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey has been increasingly used in the hospital value-based purchasing program to guide incentive payments and quality improvement efforts, and in national or state reports (e.g., National Healthcare Disparities Report) to make direct comparison of patient experience among racial/ethnic subgroups. Little is known, however, about how much variation in patient experience is accounted for by hospitals and service lines versus by patients, and whether observed racial/ethnic differences reflect real differences in the underlying constructs or systematic biases in the way people from different backgrounds respond to certain items.

This study addressed these knowledge gaps by analyzing the 2007 HCAHPS data that represented a total of 547,390 adult patients discharged from 1,313 U.S. hospitals between October 2006 and September 2007. The aims of this study were to: 1) examine the degree of the measurement invariance across seven racial/ethnic groups – non-Hispanic white, Hispanic, non-Hispanic black, Asian, native Hawaiian/other pacific islander, American Indian/Alaska native, and multiple race; 2) assess the effect of patient-, service line-, and hospital-level factors on different dimensions of patient experience; and 3) compare the relative magnitude of variation in patient experience at each level of the hierarchy (patient, service line, and hospital). The research was guided by Donabedian’s quality assessment framework, the Institute of Medicine (IOM)’s framework of patient-centered care, and Klein and Kozlowski’s multilevel theory.

To accomplish the first aim, multiple-groups confirmatory factor analyses (CFA) with progressively more stringent constraints (i.e., configural invariance, metric invariance, and scalar invariance) were used to examine the degree to which the factor structure of the instrument was invariant across the seven groups. Analyses revealed considerable configural invariance with respect to the identical pattern of fixed and free factor loadings across seven groups, and substantial metric equivalence in the actual magnitude of analogous factor loadings between non-Hispanic whites and each of the minority groups except Asians. The most stringent assumption of scalar equivalence with respect to each pair of analogous intercepts, however, was only borne out between the non-Hispanic white group and the multiple race group.

To accomplish the last two aims, a sequence of three-level models was conducted, with patients nested within service lines within hospitals. Results showed that patient experience with hospital care was significantly associated with patient-level characteristics, the service line variable, and hospital-level factors. In addition, the positive relationship between patient experience and self-reported health status differed significantly across service lines and across hospitals. Finally, the variation in patient experience was mainly attributable to the patient level (92.5-95.7%), and to a lower extent attributable to the system level (i.e., service line and hospital levels) (4.3%-7.5%)
This research has policy implications in two areas. First, findings from the multiple-groups CFA suggest that differences in several observed scores are confounded with differences in the origin or scale at the latent constructs between the non-Hispanic white group and certain minority groups, and thus, cross-group differences on these scores should be interpreted with caution. Given the growing trend of comparative research using self-reported measures, researchers should ensure the presence of the evidence of measurement invariance for the instrument they will use to make direct comparisons across population groups they are interested in. Second, the analyses using three-level models demonstrate the usefulness of this analytic method for its ability to model variation at each level of the hierarchy separately and to assess cross-level interaction effects. The findings offer evidence about the appropriate locus for targeting quality improvement efforts and the potential stratification of publicly reported data by health status and by service line.

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