

A critical review of health-related productivity measures

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CONCLUSIONS

Although both subjective and objective instruments exist to assess health-related productivity at and outside of work, subjective instruments are often used more easily in populations with varying occupations and diseases. Objective productivity assessments minimize respondent bias, but are associated with restricted generalizability and are burdensome to carry out in practice. Within the subjective instruments, the WPAI may offer the most significant advantages. Its use has been well-documented, and it can be easily adapted to populations with specific diseases.

OBJECTIVES

Health impairment often leads to work impairment in the form of both absence from work and reduced productivity at work. The objective of this study was to review and evaluate instruments designed to measure health-related productivity at work.

METHODS

A literature search was conducted using ABI Info, EconLit, PsychInfo, MEDLINE, CANCERLIT, AIDSLINE, HealthStar, databases were searched for articles published from 1990-2001. Articles that were identified beyond the formal literature search were also included in the current review. Articles identified comprised productivity measured by subjective (self-report questionnaires) and objective (computer-based tracking systems) techniques; subjective instruments included both generic and disease-specific measures.

Identified subjective instruments were evaluated on psychometric properties based on the following criteria:

- Construct validity,
- Internal consistency reliability,
- Test-retest reliability, and
- Responsiveness.

Furthermore, the instruments' recall period was considered for assessing the likelihood of results being associated with recall bias. Generalizability of the instrument across occupations and/or disease areas was also assessed, as was the administrator and respondent burden. Potential applicability for economic valuation was assessed in terms of the ability of the instrument to provide a global measure reflecting an overall reduction in productivity at work.

RESULTS

Five generic subjective instruments were identified – the Endicott Work Productivity Scale (EWPS); Health and Labor Questionnaire (HLQ)²; Health and Work Questionnaire (HWQ)³; Work Limitations Questionnaire (WLQ)⁴; and the Work Productivity and Activity Impairment questionnaire (WPAI)⁵. These instruments, often validated against other subjective measures such as health-related quality of life scales, are self-report assessments that measure productivity in terms of points or percentages. The instruments' characteristics are summarized in Table 1.

The HLQ uses a technique consistent with the friction cost method; the questionnaire collects data regarding reductions in productivity for paid and unpaid labor (including tasks completed around the house). Three of the instruments, EWPS, HWQ, and WLQ, assess productivity only during paid labor. The EWPS was designed for use in patients with a broad range of diseases and occupations but has been tested in only two small samples of psychiatric patients and community residents. Additionally, the instrument captures whether or not one's productivity is altered due to illness, it does not assess the depth or extent to which productivity falls. Further, it is designed only to measure reduced productivity at work but does not take into account time missed from work due to illness. Similar to the EWPS, the HWQ was initially developed to be applicable across various diseases. However, it has been evaluated only in one population to examine the effect of smoking of on-the-job productivity. The WLQ, also measuring on-the-job productivity, was originally developed using focus groups of patients with asthma, Crohn's disease, liver disease, depression and/or generalized anxiety. This instrument has subsequently been used and tested in other disease populations. One of its key benefits is its ability to provide estimates of productivity reductions in different work domains (demands on time, physical ability, mental-interpersonal processes, and output).

Lastly, the WPAI, like the HLQ, asks about the impact of health problems on productivity while working and completing other daily activities outside of work. The questionnaire design of the WPAI enables its use across occupations and/or disease areas. The WPAI was found to be the most well-documented and frequently used instrument. It can easily be modified to measure productivity reductions associated with specific diseases (e.g., WPAI-AS for allergic rhinitis⁶, WPAI-GERD for gastro-esophageal reflux disease⁷, WPAI-ChHD for chronic hand dermatitis⁸), a trait that enhances comparability of results between diseases, as well as transferability of results with regard to evidence of the instruments' psychometric properties. Despite the benefits of the WPAI, it is important to note one of its potential drawbacks: the data on reduced work productivity are obtained using one single item.

In addition to the disease-specific adaptations of the WPAI, two other disease-specific instruments were identified. Both are migraine-specific, self-report subjective instruments – the Migraine Disability Assessment questionnaire (MIDAS)⁹ and the Migraine Work and Productivity Loss Questionnaire (MWPLQ)¹⁰. MIDAS captures reduced and lost productivity at home and work, while the MWPLQ considers only productivity at work. However, the MWPLQ has been shown to discriminate between treatments, potentially indicating better psychometric properties than its counterpart¹¹.

Objective assessments have been carried out to measure employee productivity for tasks where individual output could be quantified (e.g., claims processed, telephone inquiries handled).¹²⁻¹⁴ To avoid respondent bias, these studies utilized computer-based tracking systems to determine productivity reduction attributable to illness. One study comparing a subjective instrument (the HWQ) with an objective measure to assess productivity was identified, where a small correlation between results obtained using these methods was found.³ Objective assessments are problematic to carry out for a number of reasons. For example, the quantitative performance of individuals needs to be accurately monitored, the quality aspect of work performed is difficult to measure and potential measurements are restricted to certain types of work.

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Table 1. Summary of subjective productivity instrument characteristics.

	Recall period (weeks)	Construct validity	Internal consistency reliability	Test-retest reliability	Responsiveness	Administrator / respondent burden*	Generalizability*	Applicable to economic evaluation*
EWPS	1	++	++	X	X	Low	X	No
HLQ	2	X	X	X	X	Low / moderate	X	Yes
HWQ	X	X	++	X	X	Low / moderate	X	X
WLQ	2 - 4	++	++	X	X	Low	X	X
WPAI-Generic	1	++	N/A	++	X	Low	High	Yes
WPAI-AS	1	++	N/A	++	++	Low	High	Yes
WPAI-GERD	1	++	N/A	X	X	Low	High	Yes
WPAI-ChHD	1	++	N/A	++	++	Low	High	Yes
MIDAS	12	X	++	X	X	Low	N/A	No
MWPLQ	Most recent episode	++	++	X	X	Moderate	N/A	Yes

* = Evaluation based on perceived property, not on formal tests; ++ = established per reviewed articles; X = data not presented in publication; N/A = not applicable