The Effects of Introducing the Klein-Bell ADL Scale in a Rehabilitation Service

(evaluation, self-care, activities of daily living)

This study investigated the impact of introducing the Klein-Bell ADL Scale into a rehabilitation medicine service. A pretest and a posttest questionnaire of rehabilitation team members and a pretest and a posttest audit of occupational therapy documentation were completed. Results of the questionnaire suggested that the ADL scale influenced rehabilitation team members' observations in the combined area of occupational therapy involvement in self-care, improvement in the identification of treatment goals and plans, and communication between team members. Results of the audit suggested that the thoroughness and quantification of occupational therapy documentation improved. The clinical implications of these findings recommend the use of the Klein-Bell ADL Scale in rehabilitation services for improving occupational therapy documentation and for enhancing rehabilitation team effectiveness.

In this age of health care accountability, more funding agencies, accrediting agencies, and hospital administrators are demanding objective measurement of patient progress. Currently, as prospective payment systems are implemented, correlations between patient progress and provided services are being examined. These trends underline the need, as stated by Yerxa (1), for occupational therapy clinics to implement reliable and valid evaluations and suggest that there is an important relationship between the appropriate documentation of patient care and the health care dollar (2). Acknowledging this relationship, the Quality Assurance Division of the American Occupational Therapy Association has encouraged the accurate and objective documentation in the field as evidenced in recent publications (3–5).

As occupational therapy clinics increase their use of objective assessment instruments to measure intervention outcomes, they need to consider, in the selection of the instrument, not only its reliability and validity but also its pragmatic characteristics. One pragmatic administrative consideration is the instrument's cost-effectiveness. A tool that requires a large amount of the therapists' time for scoring and documentation may decrease the time available for direct patient contact, or the purchase cost of an evaluation may result in an increase in clinic charges. Other pragmatic considerations relate to

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the quality of patient care services. An occupational therapy assessment can potentially increase the knowledge of the multidisciplinary staff about the role and value of occupational therapy for their patients. A tool may also help therapists identify patients' deficits, formulate treatment plans, increase the quality of communication within the treatment team, or improve occupational therapy documentation by displaying the collected information in a manner that is easily understood by others, or by providing a format for documentation.

The Klein-Bell (KB) ADL (activities of daily living) Scale (6), a self-care assessment developed for the field of occupational therapy, claims to have established reliability, validity, and applicability across disabilities, age groups, and treatment settings. The KB assesses the percentage of a patient's independence in six areas of basic self-care: dressing, elimination, mobility, bathing hygiene, eating, and emergency telephone communication. The scores of each area are then summarized on a graph.

A review of the literature, which included Klein and Bell's citations, substantiates Klein and Bell's claim that the KB is the primary existing ADL assessment to offer the above characteristics. Additionally, the KB is sensitive to small changes in function and is appropriate for the changing therapeutic needs of patients. Because of these characteristics, the KB has been incorporated into formal research projects (7, 8). It is also advocated as an occupational therapy self-care evaluation in the field's major textbook (9).

Some of Klein and Bell's declarations about the value of their instrument remain unsubstantiated. They state that their scale quickly communicates to the treatment team the level of assistance needed for daily activities and that comprehensive treatment plans can be formulated quickly because the scale identifies specific deficit areas (6).

The KB may also improve the clinical dynamics of the rehabilitation team. It may increase the team's knowledge of the role of occupational therapy. Increasing the team's knowledge about the role of one discipline has been suggested as one method of improving team effectiveness (10). Additionally, meetings serve as a primary method for increasing communication in multidisciplinary and interdisciplinary rehabilitation teams. Since the KB advocates the display of the easily understood summary graph and the need for occupational therapists to consult with physical therapists and the nursing staff about aspects of patient function, it is likely that the scale improves team communication.

It has been documented that the quality of a medical record affects the performance of a treatment program (11-13). Six characteristics of occupational therapy documentation that contribute to the quality of the medical record are directness, summarization, conciseness, readability, objectivity, and appearance (14). Since the KB is an objective and structured evaluation of self-care skills, it might improve the quality of occupational therapy documentation in rehabilitation settings where a structured evaluation form is not used. Finally, the use of a checklist has been shown to increase the thoroughness with which occupational therapists evaluate clinical situations (15). Since the KB categorizes self-care into six precise areas, it might serve as a checklist to remind therapists to record information in all these areas.

The purpose of this study was to determine whether or not the implementation of the Klein-Bell ADL Scale would significantly improve occupational therapy services in a rehabilitation facility. It was hypothesized that improvement would occur in four areas and that the Klein-Bell ADL Scale would do the following:

1. increase a rehabilitation team's knowledge of the role of occupational therapy in ADL training;
2. improve the rehabilitation team's identification of patients' self-care problems and treatment goals;
3. improve occupational therapy communication of self-care status to other rehabilitation team members; and
4. improve the quality of occupational therapy documentation of patients' status, progress, plans, and goals.

Method

Data were collected via two methods: (a) a questionnaire completed by members of the rehabilitation team (which tested subhypotheses 1, 2, and 3) and (b) an audit of medical records (which tested subhypothesis 4). Data were collected both before the introduction of the KB and after a 6-week use of the scale. Questionnaire respondents formed four data sets: (a) data from those completing the questionnaire only before the introduction of the KB scale (pretest), (b) data from those completing the questionnaire only after the use of the KB scale (posttest), (c) data from the pretest questionnaires of those completing the questionnaire both times, and (d)
data from the posttest questionnaires of those completing the questionnaire both times.

A regional medical facility in the state of Oregon with acute, rehabilitation, and outpatient services and no previous experience with the scale was selected as the research facility.

A pilot questionnaire was designed and revised after feedback was received from 25 multidisciplinary rehabilitation professionals outside the state of Oregon. The revised questionnaire consisted of 20 questions to be answered on a frequency scale of never, rarely, sometimes, usually, always, and not applicable or do not know. Some questions focused on the role of the occupational therapist in self-care. For example, the questionnaire states that “self-care training is coordinated by the occupational therapist.” Others dealt with aspects of treatment planning or communication with team members. For example, the questionnaire states that “occupational therapists involve the patient in formulating treatment goals in self-care” and that “occupational therapists initiate patient care discussions with other team members.”

The 20-item questionnaire was administered to 33 members of the rehabilitation team, including physicians, nurses, therapists (occupational therapist, physical therapist, and speech and language pathologists), psychologists, and medical social workers 4 weeks before the introduction of the KB Scale to the facility.

The use of the KB scale began with a standard orientation session for the occupational therapy staff. The orientation included viewing the videotape Occupational Therapy Evaluation: Klein-Bell Activities of Daily Living Scale (16) and discussing the “Administration and Scoring Manual” (17) as well as the article written by Klein and Bell in the Archives of Physical Medicine and Rehabilitation (6). The staff (blind to the research study) was instructed to use the scale for a 6-week trial period, after which the occupational therapy department would assess the tool and decide on its continued use.

Following the 6-week trial on the rehabilitation unit and the acute and outpatient services, the study questionnaire was readministered to the rehabilitation team members.

The initial chart audit identified several problems related to the documentation of occupational therapy weekly notes, the initial evaluations, and the discharge summaries. At this institution, weekly notes were not comprehensive; hence the percentage of incomplete information was high and resulted in imbalanced data sets. This audit also failed to acquire data on occupational therapy goals and plans; it focused only on patient status and progress. Finally, only a small data set was accumulated (because of the limited time frame given to the auditor), even though a much larger data set was available.

In the second audit the data set was increased by expanding the chart search to 37 notes before KB use and 32 notes after KB use. Also, the second audit focused on initial evaluations and discharge summaries and assessed the documentation of occupational therapy plans and goals for six ADL skill areas and for the total of self-care skills. Specifically, the audit noted whether status/progress and plans/goals were present and, if present, whether they were quantitative. (Notes with percentages, degrees, seconds, scores, or other objective measures were considered quantitative.)

Results

Questionnaire Analysis

All statistical analyses were run with the Statistical Package for the Social Sciences (SPSS) (18). Analysis of variance compared the questionnaire data. No differences were observed (a) between any of the four data groups \( (F = 7.48, p = .5278) \), (b) between data sets from respondents completing the questionnaire only once \( (t = .285, p = .778) \), (c) between data sets from respondents completing the questionnaire twice \( (t = 1.144, p = .257) \), or (d) between all pretest questionnaires and all posttest questionnaires \( (t = .679, p = .499) \). No differences were identified using a total questionnaire mean, as cited above, or in a question-by-question analysis, or by subhypothesis-grouped questions. Therefore, subhypotheses, 1, 2, and 3 were not confirmed.

Post hoc statistics, however, revealed that many respondents com-
completed the questionnaire items in the not applicable or do not know categories or failed to enter a response. Using a t test, the pretest and posttest groups of data were analyzed in regard to the number of not applicable, do not know or missing answers. The pretest group displayed significantly more of these responses than the posttest group (see Table 1). The primary difference between these two groups was in the unpaired pretest and posttest data sets from respondents who completed the questionnaire only once (see Table 2).

Audit Analysis

Multiple t tests were performed on the audit data broken into hypothesis subgroups. Results appear in Table 3. Specifically, in the posttest audit the number of status and progress notations was significantly higher \( (t = 5.37, p \leq .000) \) as was the number of quantitative notations of patient status and progress \( (t = 11.21, p \leq .000) \). However, neither the presence nor the quantification of goals and plans increased significantly in the posttest audit.

The significance of the status and progress data was powerful enough to compensate for plans and goals subgroup data and cause an overall increase in documentation characteristics between pretest and posttest audit data \( (t = 10.50, p \leq .000) \).

Post hoc and descriptively, each of the six subareas of ADL documentation and the total score were examined to see if each was equally influenced by the intervention of the KB. The results show all areas increased in the quality of documentation with the exception of telephone use (see Table 4). These findings support subhypothesis 4.

Discussion

The lack of significance from data addressing subhypothesis 1, 2, and 3 may be due to several factors. The fact that a high degree of interdisciplinary teamwork already existed in the study facility \( (10) \) may have skewed the questionnaire results and lessened the difference between pretest and posttest questionnaires. Moreover, the number of questions unanswered or answered as not applicable or do not know might indicate that the questionnaire was inadequate to address the subhypotheses clearly. Still, the finding that these kinds of responses significantly decreased after the introduction of the KB scale suggests that the KB scale may have made it easier for respondents to informatively answer questions about occupational therapy and self-care programs. Furthermore, the descriptive analysis comparing the data sets of nonpaired respondents, omitting those respondents completing the questionnaire before and after the introduction of the KB, indicated that the observed differences were not due to a test-retest variable. This again supports the contention that the KB was a primary influence on the differences between pretest and posttest questionnaires. Whether changes occurred in the area of occupational therapy involvement in self-care, improvement in the identification of treatment goals and plans, or communication between team members remains unanswered, however, because the post hoc

![Table 2](http://ajot.aota.org/423)

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>No. of Cases</th>
<th>( M )</th>
<th>( SD )</th>
<th>( t ) Value</th>
<th>One-Tailed Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>21</td>
<td>4.952</td>
<td>3.968</td>
<td>2.00</td>
<td>.017</td>
</tr>
<tr>
<td>Posttest</td>
<td>17</td>
<td>2.697</td>
<td>1.869</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Documentation</th>
<th>Data Group</th>
<th>No. of Cases</th>
<th>( M )</th>
<th>( SD )</th>
<th>( t ) Value</th>
<th>One-Tailed Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of status/progress</td>
<td>Pretest</td>
<td>37</td>
<td>4.9</td>
<td>0.941</td>
<td>5.37</td>
<td>.000</td>
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<tr>
<td>Presence of status/progress</td>
<td>Posttest</td>
<td>32</td>
<td>6.4</td>
<td>1.264</td>
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<td></td>
</tr>
<tr>
<td>Presence of plans/goals</td>
<td>Pretest</td>
<td>37</td>
<td>0.7</td>
<td>0.661</td>
<td>1.27</td>
<td>.105</td>
</tr>
<tr>
<td>Presence of plans/goals</td>
<td>Posttest</td>
<td>32</td>
<td>1.0</td>
<td>1.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative status/progress</td>
<td>Pretest</td>
<td>37</td>
<td>1.5</td>
<td>1.406</td>
<td>11.21</td>
<td>.000</td>
</tr>
<tr>
<td>Quantitative status/progress</td>
<td>Posttest</td>
<td>32</td>
<td>1.0</td>
<td>1.926</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative plans/goals</td>
<td>Pretest</td>
<td>37</td>
<td>0.0</td>
<td>0.164</td>
<td>2.24</td>
<td>.014</td>
</tr>
<tr>
<td>Quantitative plans/goals</td>
<td>Posttest</td>
<td>32</td>
<td>0.2</td>
<td>0.491</td>
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<td></td>
</tr>
<tr>
<td>Overall</td>
<td>Pretest</td>
<td>37</td>
<td>7.135</td>
<td>1.932</td>
<td>10.50</td>
<td>.000</td>
</tr>
<tr>
<td>Overall</td>
<td>Posttest</td>
<td>32</td>
<td>13.531</td>
<td>3.069</td>
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</table>

* Multiple t tests were performed on this audit data set increasing the experimentwise error rate.
analysis did not investigate these questions. Although the audit data did not show a significant improvement in the documentation of occupational therapy goals and plans, the increase in the thoroughness and quantification of documentation regarding occupational therapy status and progress suggests that occupational therapy documentation improved after the use of the KB scale.

Limitations of the study include the lack of a control group. Test and retest conditions were controlled by the two-level research design (paired and unpaired data sets), but this design does not avoid the potential influence of the moderating variables of other coincidental changes during the research period. Despite these limitations, the findings of significance suggest that using the Klein-Bell ADL Scale had an overall positive effect on the occupational therapy services provided in the rehabilitation facility studied. Specifically, it influenced the thoroughness and quantification of occupational therapy documentation and the effectiveness of the rehabilitation team. These results proceed beyond the scale’s established reliability and validity and contribute information about the administrative and clinical value of the instrument. Such an evaluation appears to provide a method to increase the accountability of occupational therapy in the field of rehabilitation.

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REFERENCES


| Table 4: Comparison Between Categories of ADL Before and After KB Intervention |
|---------------------------------|------|-------|
| **Area of ADL**                | **t Value** | **One-Tailed Probability** |
| Dressing                       | 4.28  | <0.00 |
| Elimination                    | 5.49  | <0.00 |
| Mobility                       | 7.43  | <0.00 |
| Bathing/Hygiene                | 7.66  | <0.00 |
| Eating                         | 1.70  | <0.00 |
| Telephone Use                  | 10.49 | <0.047|
| Total Self-Care/Independence   | 6.06  | <0.00 |

ADL, activities of daily living; KB, Klein-Bell (refers to the Klein-Bell ADL Scale, see Ref. 6).