Does language ambiguity in clinical practice justify the introduction of standard terminology? An integrative review

Hillegonda A. Stallinga
Huib ten Napel
Gerard J. Jansen
Jan H.B. Geertzen
Pieter F. de Vries Robbé
Petrie F. Roodbol

Journal of Clinical Nursing 2015; 24(3-4): 344-52
Abstract

Aims and objectives: To research the use of ambiguous language in written information concerning patients’ functioning and to identify problems resulting from the use of ambiguous language in clinical practice.

Background: Many projects that aimed to introduce standard terminology concerning patients’ functioning in clinical practice are unsuccessful because standard terminology is rarely used in clinical practice. These projects mainly aim to improve communication by reducing ambiguous language. Considering their lack of success, the validity of the argument that language ambiguity is used in clinical practice is questioned.

Design: An integrative literature review.

Methods: A systematic search of the MEDLINE (1950-2012) and CINAHL (1982-2012) databases was undertaken, including empirical and theoretical literature. The selected studies were critically appraised using a data assessment and extraction form.

Results: Seventeen of 767 papers were included in the review and synthesis. The use of ambiguous language in written information concerning patients’ functioning was demonstrated. Problems resulting from the use of ambiguous language in clinical practice were not identified. However, several potential problems were suggested, including hindered clinical decision-making and limited research opportunities.

Conclusion: The results of this review demonstrated the use of ambiguous language concerning patients’ functioning, but health professionals in clinical practice did not experience this issue as a problem. This finding might explain why many projects aimed at introducing standard terminology concerning functioning in clinical practice to solve problems caused by ambiguous language are often unsuccessful. Language ambiguity alone is not a valid argument to justify the introduction of standard terminology.

Relevance to clinical practice: The introduction of standard terminology concerning patients’ functioning will only be successful when clinical practice requires the aggregation and reuse of data from electronic patient records for different purposes, including multidisciplinary decision-making and research.
2.1 Introduction

During the past few decades, numerous projects have aimed to introduce standard terminology in clinical practice, particularly in nursing and paramedical practices. Many of these projects are motivated by the assumption that standard terminology facilitates precise communication and that it will improve documentation by eliminating and reducing language ambiguity.

The use of ambiguous language means that one term allows for multiple interpretations. For example, research has shown that physical therapists define the term ‘trainability’ (a commonly used Dutch term) as the extent to which functions related to respiratory and cardiovascular capacity can be trained, whereas nurses define ‘trainability’ as the extent to which an activity to develop skills can be trained.

In contrast to ambiguous language, unambiguous language entails a common understanding of terms or concepts. Unambiguous language is facilitated by standard terminology because in a selected set of terms, each term has a discrete meaning. Standard terminology can enhance the quality of documentation, enable the design of quality assurance and decision support systems, and facilitate the aggregation of research data from electronic patient records (EPRs). The most commonly known standard terminology in health care is the International Classification of Diseases (ICD). The ICD is used as an international standard to compare and share information about causes of death, diseases, injuries, and symptoms using a common language.

Examples of other standard terminologies that are unrelated to diseases include the North American Nursing Diagnosis Association, the Uniform Terminology for Occupational Therapy, the American Dietetic Standardized Language, and the International Classification of Functioning, Disability, and Health (ICF), which is a non-discipline-specific standard terminology. The shared goal of all these examples of standard terminologies is related to patients’ functioning.

Functioning is defined by the World Health Organization (WHO) in the ICF as an umbrella term encompassing all body functions (e.g. hearing), activities (e.g. washing oneself), and participation (e.g. community life). The WHO indicates that these components can be expressed in two manners: 1) “they can be used to indicate problems (i.e. impairment, activity limitation,
or participation restriction summarized under the umbrella term disability)”, and 2) “they can indicate non-problematic (i.e. neutral) aspects of health and health-related states (summarized under the umbrella term functioning)”.

Functioning is based on the biopsychosocial model. Engel introduced the clinical application of the biopsychosocial model in response to the disease-centered and reductionist orientation of medical thinking in the mid-twentieth century. Currently, however, health care provision has a broader, more holistic view than the medical model. Knowledge of functioning provides health care providers with a better understanding of the full burden of a health condition and the impact of a disease on an individual’s life. The ICF classifies aspects of functioning to obtain a description of health and is intended for use in clinical practice. The ICD classifies disease entities and other health conditions to gather disease diagnostic information but is neither intended nor suitable for the indexing of distinct clinical entities. The WHO’s acceptance of the ICF in 2001 has made it possible to communicate about functioning in standard terms between and within all health care disciplines worldwide. The use of both classifications together results in a fuller picture of health or health-related states of an individual. This will provide health professionals with an integrated model, which in turn will support multidisciplinary communication towards a coordinated planning of care to improve health.

However, many projects that have attempted to introduce in clinical practice standard terminology such as ICF or one of the other classifications relating to functioning have been unsuccessful. Until now, none of the standard terminologies concerning functioning have been used throughout all health care organizations and disciplines. Many settings and systems still use their own language for documentation.

A model for effective implementation of standard terminology in health care practice was developed by Grol and Wensing. This model shows that the first step in an effective introduction of a new procedure or innovation involves the analysis of current practice versus proposed practice. This analysis should ideally confirm that the proposed innovations would meet practice needs. Additionally, “without this match, the implementation might not be justified”. With regard to the successful introduction of standard terminology in clinical practice, this statement means that the current practice must have problems with language ambiguity. We reviewed the literature to analyze the lack of success of projects aimed at introducing standard
terminology related to functioning. We have researched the actual use and problems resulting from the use of ambiguous language to determine whether the practice needs justify the introduction of standard terminology.

2.2 Aims and methods

2.2.1 Aim
The aim of this integrative review was to answer two specific research questions. 1) Is ambiguous language concerning functioning used in written patient information produced by health care professionals in clinical practice? 2) What problems occur in clinical practice because of the use of ambiguous language about functioning in written patient information?

2.2.2 Design
Because of the paucity of published research on the use of language ambiguity in written patient information concerning functioning, we performed an integrative review of the literature. An integrative review is described by Whittemore and Knafii as a specific review method in which data from empirical and theoretical literature are merged to obtain extensive insight into a specific topic. An integrative review allows for the combination of data from primary sources utilizing different methodologies to review evidence.26

2.2.3 Search strategy
A comprehensive search was conducted by a librarian and the first author using the term ‘ambiguous language’ as well as synonyms and connotations (i.e. ‘universal language,’ ‘common language,’ and ‘standard language’) of this term. The search string was limited to functioning, disciplines, and setting. Next, the MEDLINE (1950-2011) and CINAHL (1982-2011) electronic databases were systematically searched. We started from the first year of coverage of each database to reduce the risk of missing potentially relevant papers. We limited our search to English language papers with available abstracts.

The information from titles and abstracts of the papers found in the search was used to select papers. To be considered for inclusion, papers had to explicitly report on the use of language in written patient information by health care professionals concerning functioning. Papers were excluded if
they reported on spoken patient information or patient information regarding medical status, as well as the use of ambiguous language between patients and health care professionals.

The first author (HAS) screened the titles and abstracts retrieved in the survey. When in doubt, the second author (HtN) was consulted. Differences between these authors were resolved through discussion or by consulting with the research committee, which consisted of experts on functioning (PFR) and terminologies (PdVR). A hand search and author search were conducted but did not yield any new papers.

### 2.2.4 Search outcome

The database search resulted in 767 potentially relevant papers. After removing duplicates and screening the titles and abstracts, 100 papers were included for full-text evaluation. Finally, 83 papers did not meet the inclusion criteria. Seventeen papers were included for further analysis to answer the research questions. The flow diagram of the study selection process is shown in Figure 2.1.

![Figure 2.1](image-url) Flow diagram of study selection process.
2.2.5 Data abstraction and synthesis
The full text of the potentially relevant papers was independently analyzed by two researchers (HAS and HtN) using a data assessment and extraction form. The reviewers developed this form under the supervision of the research committee. The form contained the following items: general information (i.e. title, authors, country of origin, journal, and publication year), contextual information (disciplines and settings), and content information about the study (objective, design, and results). All papers were thoroughly reviewed and subsequently rejected or assigned with arguments.

After evaluating the included papers, findings that were related to language use were classified into the following groups: 1) ambiguous language, defined as ‘one term reflecting different meanings’; 2) potentially ambiguous language, defined as ‘different terms reflecting the same (one) meaning’; and 3) unambiguous language, defined as ‘one term reflecting one meaning’. The results were synthesized by consensus between the researchers and the research committee. Any disagreements were resolved through discussion.

2.2.6 Quality appraisal
Paper quality was assessed using criteria developed by the reviewers. In an integrative review, a ‘gold standard’ to evaluate the quality of the studies does not exist.26 The following criteria, which are based on validity domains used to evaluate studies,27 were developed by the reviewers and confirmed by the research committee: proper description of the study objective (yes/no), adequate research method (yes/no), proper selection of the study sample (yes/no), soundness and completeness of measurement (yes/no), and outcome assessment (yes/no). Given the wide variety of study designs, the number of relevant items varied between papers. Papers were included in the final analysis if they scored ‘yes’ on any relevant item. Papers describing views and opinions were not considered to be suitable for assessment with these criteria. These papers were mainly used in this review to explore the use of ambiguous language and the problems caused by this use in general clinical practice.
2.3 Results

General characteristics of the 17 included papers are presented in Table 2.1 and cited (*) in the reference list. Most papers (n = 10) were published in 2002 or later. Seven papers were published in medical informatics journals, such as Journal of the American Medical Informatics Association, Studies in Health Technology and Informatics, and International Journal of Medical Informatics. One dissertation was included.

The study design of half of the included papers was considered to be expert opinion (n = 8).\(^4\,^9\,^{28},^{29}\) Five papers were record analyses.\(^{30}\,^{34}\) One paper was a survey,\(^{35}\) and the Blewitt and Jones study\(^{36}\) was both a record analysis and a survey. There was one observational study\(^2\) and one literature review.\(^{37}\)

Half of the papers were from the USA (n = 9). Six papers were from Europe, one was from Canada, and one was from New Zealand. More than 75% (n = 13) of the papers were applicable to one discipline, with most papers belonging to the discipline of nursing (n = 10). The other papers were applicable to multidisciplinary teams.

Table 2.1 Characteristics of the included papers ordered by reference.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Country; Discipline</th>
<th>Findings related to language use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algase et al.(^{37})</td>
<td>Literature review</td>
<td>USA; Non-specific</td>
<td>Many different terms used for wandering in clinical practice could be reduced to one term with one meaning.</td>
</tr>
<tr>
<td>Blewitt &amp; Jones(^{36})</td>
<td>Survey &amp; Record analysis</td>
<td>USA; Nursing</td>
<td>Nursing documentation was inconsistent with clinical decision-making in practice.</td>
</tr>
<tr>
<td>Borst &amp; Nelson(^{35})</td>
<td>Survey</td>
<td>USA; Occupational therapy</td>
<td>Low levels of agreement between meanings of terms used by occupational therapists and meanings of standard terms</td>
</tr>
<tr>
<td>Carlsson et al.(^{34})</td>
<td>Record analysis</td>
<td>Sweden; Nursing</td>
<td>Care planning was not visible in patient records. The language used was vague and not professional.</td>
</tr>
<tr>
<td>Charney(^7)</td>
<td>Expert opinion</td>
<td>USA; Dietetic</td>
<td>If standard terminology is lacking, it is impossible to aggregate, manage and share patient data.</td>
</tr>
<tr>
<td>Reference</td>
<td>Design</td>
<td>Country; Discipline</td>
<td>Findings related to language use</td>
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<tr>
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</tr>
<tr>
<td>Coward</td>
<td>Record analysis</td>
<td>Canada; Nursing</td>
<td>Nursing classifications differed significantly in their ability to capture terms used by nurses in clinical practice.</td>
</tr>
<tr>
<td>Engelbrecht et al.</td>
<td>Expert opinion</td>
<td>Germany; Non-specific</td>
<td>Communication between heterogeneous environments will only be possible when standard terminologies are available.</td>
</tr>
<tr>
<td>Fink &amp; Rosendal</td>
<td>Expert opinion</td>
<td>Denmark; General practitioners</td>
<td>Due to a lack of standard terms for functional somatic disorders, there is no common understanding of this concept.</td>
</tr>
<tr>
<td>Florin et al.</td>
<td>Expert opinion</td>
<td>Sweden; Non-specific</td>
<td>Different disciplines reached consensus about the use of one standard terminology to document patient care.</td>
</tr>
<tr>
<td>Kane &amp; Mahony</td>
<td>Record analysis</td>
<td>USA; Nursing</td>
<td>Problem descriptions in clinical practice did not sufficiently describe patient problems and were inconsistent with standard terms.</td>
</tr>
<tr>
<td>Marin</td>
<td>Record analysis</td>
<td>USA; Nursing</td>
<td>Two thirds of words used in patient documentation, were not linkable to standard terminology.</td>
</tr>
<tr>
<td>Ozbolt</td>
<td>Expert opinion</td>
<td>USA; Nursing</td>
<td>Documentation of nursing care has been idiosyncratic and unstandardized.</td>
</tr>
<tr>
<td>Ozbolt et al.</td>
<td>Record analysis</td>
<td>USA; Nursing</td>
<td>Terms used to describe patient problems and outcomes in clinical practice, could be reduced based on their meaning by half.</td>
</tr>
<tr>
<td>Payne &amp; Martin</td>
<td>Expert opinion</td>
<td>USA; Nursing</td>
<td>Standard terminology facilitate clinical decision making and multidisciplinary communication in research and practice.</td>
</tr>
<tr>
<td>Tempest &amp; McIntyre</td>
<td>Review and expert opinion</td>
<td>United Kingdom; Non-specific</td>
<td>Standard terminology will clarify team roles and support clinical reasoning.</td>
</tr>
<tr>
<td>Thoroddsen &amp; Ehnfors</td>
<td>Observational study</td>
<td>Iceland; Nursing</td>
<td>Statistically significant improvement of the use of standard terminology in the documentation of daily nursing after training.</td>
</tr>
<tr>
<td>Wilson &amp; Duke</td>
<td>Expert opinion</td>
<td>New Zealand; Nursing</td>
<td>Standard terminology gave the opportunity to describe, compare, examine and analyse clinical practices and processes.</td>
</tr>
</tbody>
</table>
2.3.1 The use of ambiguous language

Table 2.2 shows the results related to the use of ambiguous language, potentially ambiguous language, and unambiguous language. One paper\textsuperscript{15} demonstrated the use of ambiguous language, signifying that one term reflects different meanings. Borst and Nelson\textsuperscript{35} examined the level of agreement regarding the meaning of terms between occupational therapists and the uniform terminology for occupational therapists.\textsuperscript{16} Occupational therapists were asked to match 15 different meanings with one of the 65 listed standard terms in the uniform terminology. Their paper demonstrated a disagreement between the meanings of 30% of the terms used in the standard terminology and the meanings given to these terms. For example, the term ‘attention span’ was equally well matched with the meaning ‘sustaining a purposeful activity over time’, and with ‘focusing on a task over time.’ According to the uniform terminology, however, the latter meaning does not correlate to ‘attention span’ but to ‘activity tolerance’.\textsuperscript{15}

Table 2.2 Results for the use of (un)ambiguous language.

<table>
<thead>
<tr>
<th>Language use</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambiguous language</strong></td>
<td></td>
</tr>
<tr>
<td>Different meanings for 30% of standard terms</td>
<td>Borst and Nelson\textsuperscript{35}</td>
</tr>
<tr>
<td><strong>Potential ambiguous language</strong></td>
<td></td>
</tr>
<tr>
<td>Reduction of documented nursing statements to standard terms: reduction to 47% of the original number of statements</td>
<td>Ozbolt et al.\textsuperscript{30}</td>
</tr>
<tr>
<td>75% of documented terms were not standard terms but reflected the same meaning as standard terms</td>
<td>Coward\textsuperscript{32}</td>
</tr>
<tr>
<td>35% of documented terms reflected the same meaning while different terms were used in the two health care settings</td>
<td>Coward\textsuperscript{32}</td>
</tr>
<tr>
<td><strong>Unambiguous language</strong></td>
<td></td>
</tr>
<tr>
<td>7% of documented terms reflected the same term and same meaning as standard terms</td>
<td>Coward\textsuperscript{32}</td>
</tr>
<tr>
<td>33% of frequently recorded terms had the same term and the same meaning as standard terms</td>
<td>Marin\textsuperscript{33}</td>
</tr>
</tbody>
</table>

The use of potentially ambiguous language, signifying that different terms reflect the same meaning, was demonstrated by two record analyses.\textsuperscript{30,32} Coward\textsuperscript{32} showed that 75% of the documented terms were not standard terms; however, the documented terms did reflect the same meaning as standard terms. Coward\textsuperscript{32} also found that 35% of the documented terms used by hospital nurses to describe patients’ problems at the time of discharge (i.e.
‘impaired seeing functions’) differed from the terms used by home care nurses (i.e. ‘almost blind’), but they actually described the same problems. Ozbolt et al.\textsuperscript{30} created a standard terminology that reduced the number of terms used in clinical practice to 47\% of the documented terms.

The use of unambiguous language, signifying that one term reflects one meaning was demonstrated by two papers. Coward,\textsuperscript{32} in the same study mentioned above, indicated that approximately 7\% of the documented terms were included in the standard terminology. Marin\textsuperscript{33} showed that 33\% of frequently used terms in patient records have consistent terms and meanings.

In multiple papers, the use of ambiguous language was not demonstrated but suggested. Three record analyses and one expert opinion paper explained in their overall conclusion that written patient information was often vague, inconsistent, unspecified, and used free text and non-professional terms.\textsuperscript{2,29,34,36} One opinion paper\textsuperscript{8} noted that clinicians feel that there is a lack of understanding between professionals concerning the terms used to describe patients’ problems and outcomes. A literature review\textsuperscript{37} found that no less than 120 different terms are used for ‘wandering’ and that this term included aimless walking, absconding, and elopement. The meanings of these terms were more or less similar.

2.3.2 Problems in clinical practice because of the use of ambiguous language

Clinical practice problems caused by the use of ambiguous language were not found in the literature. None of the included papers examined clinical practice problems because of the use of ambiguous language. However, five papers, including three record analyses\textsuperscript{31-33} and two expert opinion papers,\textsuperscript{8,9} suggested hindered clinical decision-making regarding patient problems, goals, interventions, and outcomes because of the use of ambiguous language or, more specifically, because of the absence of standard term use. Coward\textsuperscript{32} found preliminary evidence that inadequate information transfer related to the use of ambiguous language may lead to adverse patient outcomes caused by wrong decision-making by professionals. Kane and Mahony\textsuperscript{31} and Marin\textsuperscript{33} reported hindered clinical decision-making in general. Fink and Rosendal\textsuperscript{9} suggested that patients with identical clinical pictures may receive different diagnostic labels, depending on the individual professional. Tempest and McIntyre\textsuperscript{8} found that clinicians acknowledge that there is no unequivocal
understanding about goals and interventions. Consequently, interventions by
different members of the multidisciplinary team are not geared to one another.
Three opinion papers\textsuperscript{4,5,7} described the potential benefits of using standard
terminologies for clinical decision-making.

Another frequently mentioned problem, which is not directly related to
clinical practice, was the effect of limited use of ambiguous language or the
non-use of standard terminologies on research. Thirteen papers\textsuperscript{2,4-6,28-31,33-37}
stated that it is currently impossible to aggregate, share, and reuse data from
patient records.

2.4 Discussion

Our literature review demonstrated the use of ambiguous language and
potential ambiguous language in written information concerning patients’
functioning. Problems resulting from the use of ambiguous language in clinical
practice were not identified. This result might explain the lack of success
in many projects that aimed to introduce standard terminology in clinical
practice. According to the implementation theory of Grol and Wensing,\textsuperscript{24} the
success of an effective implementation depends on whether the proposed
innovation meets practice needs. If problems related to the use of ambiguous
language were not identified, the practice needs may not match the proposed
introduction of standard terminology. Such a mismatch is considered to
be a crucial barrier to the introduction of a new procedure or innovation.\textsuperscript{25}
Nevertheless, problems resulting from the use of ambiguous language or
lack of standard terminology were suggested in the included papers. These
suggested problems included hindered clinical decision-making, particularly in
multi-disciplinary collaborations, and limited opportunities for research.

Our results are relevant in the context of the Institute of Medicine’s
(IOM) recently described vision of the future of health care. IOM presented a
transformation of the United States health care system with nurses playing
a central role that includes offering multidisciplinary and integrated care
(recommendation 2) and improving the collection of data (recommendation
8).\textsuperscript{38} In such a health care system, the use of unambiguous language
concerning functioning provided by standard terminology is essential and
could be employed in accordance with the possibilities of EPR.\textsuperscript{39}

More than 50\% of the included papers were in the field of nursing. This
result could be explained by the fact that nursing is the discipline that is pre-
eminently associated with patients’ functioning. A second explanation for
the large proportion of nursing papers could be because of the development
of nursing towards an independent profession in the past decade. During
this process, several standard terminologies were developed to encapsulate
discipline-specific knowledge with the aim of clarifying nursing contributions
to patient outcomes.

The included papers were based on studies in Europe, North America,
and New Zealand. This finding might be explained by the increasing number
of non-communicable, chronic diseases (e.g. diabetes and cancer) in
those geographical regions compared to most countries in the Southern
Hemisphere, where the prevalence of communicable, infectious diseases
is greater. With respect to non-communicable, chronic diseases, the focus
of health care will shift from curing diseases to improving functioning to
promote health.

Seven of the 17 papers reviewed were published in medical informatics
journals. This finding could indicate that the use of language and standard
terms belongs to the field of Information and Communication Technology
(ICT). ICT workers, researchers, and policy-makers in particular, found the
failure of clinicians to use standard terminology problematic because it hinders
the aggregation of data related to functioning from written patient information.
This type of analysis is in contrast to the aggregation of data related to
diseases. The use of the ICD facilitates the inclusion of diseases in national
and international statistics for various policy purposes. Thus, diseases are
fully embedded in our society and form the basis for reimbursement.

Our study has certain limitations. First, the term ‘ambiguous language’
did not prove to be a standard search term in literature databases, which
hampered our search for papers suitable for inclusion in our study.
Consequently, we had to search the databases using synonyms and
connotations of ambiguous language. By using these terms, or likely by not
using some alternative terms, we might have missed potentially relevant
papers. Furthermore, some selection bias (the probability that a publication
is or is not included) and information bias (over/under-representation of
reporting on the use of (un)ambiguous language in the included articles) may
have occurred. We have tried to minimize this bias by having two reviewers
independently assess the studies.

2.4 Discussion
2.5 Conclusion

Our findings demonstrated the use of ambiguous language concerning patients’ functioning in clinical practice. However, health professionals in clinical practice did not experience this issue as a problem. Many projects are concerned with introducing standard terminology in clinical practice, but little attention has been paid to the actual problems (in current practice) that are caused by the use of ambiguous language. This issue warrants further research. Following implementation of the Grol and Wensing\textsuperscript{24} theory, the lack of success of projects introducing standard terminology might be because clinical practice needs do not require the introduction of such standard language. Standard terminology is mainly aimed at the aggregation and reuse of data from EPRs for several purposes, such as multidisciplinary decision-making and research. If these issues become important to clinical practice, as demonstrated in the IOM report,\textsuperscript{38} then standard terminology concerning patients’ functioning will likely be successfully introduced. The use of ambiguous language is not a valid argument to justify the introduction of standard terminology in clinical practice. This review provides useful information that can inspire further, much needed research on the use of language and its consequences for clinical practice with regard to the introduction of standard terminology concerning functioning.

2.6 Relevance to clinical practice

The introduction of standard terminology concerning functioning will only be successful when clinical practice requires the aggregation and reuse of EPR data related to functioning for several purposes, including multidisciplinary decision-making and research.
References


References
“Wat zijn de doelen in uw leven? Die vraag moet gesteld worden voordat een besluit genomen wordt over de medische behandeling.”

TvZ | Tijdschrift voor Verpleegkundigen, 2012 nr 6, Gonda Stallinga.