

Enhancing Hospital Nursing Documentation Quality through Optimized Paper Record Designs: A Scoping Review

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Abstract

Nursing documentation is essential in assuring quality patient care, communication, and legal responsibility in the hospital facilities. Even with the emergence of electronic health records, a lot of institutions are yet to move to a paper-based system and even at that, bad form design may interfere with data accuracy and data consistency. The scoping review examines literature regarding the effect of the design of paper-based nursing records in determining the quality of documentation in hospitals. The review outlines the main characteristics of successful record designs, points at major issues in existing practices of paper documentation, and mentions evidencebased design principles that boost usability, completeness, and clinical relevance. Results indicate that predetermined layouts, standardized language, and visual elements enhance documentation results in a huge way. The present review shall assist healthcare administrators and practitioners in the optimal use of paper record tools to the advantage of improved nursing care and continuity of information.

Keywords: *Paper-based documentation, nursing records, hospital care, documentation quality, healthcare forms design, patient safety, structured charting, nursing communication, scoping review, clinical documentation improvement.*

1.Introduction

When it comes to modern healthcare delivery, accurate and standardized clinical documentation is the basic element of quality care, patient safety, and interprofessional communication. Nurses in general and especially those working in hospital environments are considered the custodians of vast amounts of patient information as they record all the vital signs and assessment as well as intervention and patient response among others. Not all information flow is clerical, but some such information flow is essential to the process of continuity of care and to the process of clinical judgment and legal and administrative evidence of the care provided. Other than in clinical practice, nursing documentation is also central in educational efforts, quality improvement endeavors and health system research. With this centrality, it becomes important to ensure that the tools that nurses utilize particularly records (paper-based), are not only designed with a sense of clarity but also purpose and usability.

Although electronic health systems have seen improvements in the documentation, paper documentation is still a widely used practice in both high-income countries and in low- and middle-income countries (LMICs). The prevalence of paper-based capture of inpatients data is still high in many medical facilities, especially those in the resource depleted areas. In even the United States, Australia and the UK; the use of Office Based Information Systems is underutilized and this can be seen in tasks like constant collection of physiological parameters as most of this work is still done on paper(1). This ongoing dependence reveals the necessity to maintain a well-organized paper record to aid efficient data capture and qualifying care.

These paper tools are hence designed in a way that is normally ignored. The focus and understanding of the creation, organization, and application of paper records to practice have long been relatively lacking based on research because study had focused on electronic documentation systems. Where studies are present, they tend to point to inefficiencies in the paper documentation systems used and note the costs of such inefficiencies in terms of worsened quality of data, added burden on work force and barriers to communication between healthcare staff. In a considerable number of incidences, the inappropriate design of documentation forms is one of the contributors to difficulty in collection and utilization of data. As an illustration, when a similar field of information needs to be entered in different forms the nurses will end up performing redundant tasks but also run the risk of either inconsistency or lack of accuracy which compromises the integrity of the process over all. Moreover, incomplete, less standardized, or irrational forms can lead to missing and unaccountable data, delay in providing care, and loss

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of a chance to rescue the failing patient. These obstacles also hinder the transition towards the utilisation of electronic systems since the core data structure in the usage of paper form can frequently shape its digital version. Existing works have tried to determine how much time has to be invested to make nursing documentation or they address the error rates and legal consequences but these are usually limited in nature. An evident lack of elaborated evidence on the conception and refinement of paper-based charts with the help of systematic methodology exists. This gap is particularly essential given the dire need of scalable, successful, and context-sensitive documentation tools especially in LMICs, where the digital infrastructure might be weak or non-existent(2).

To the best of our knowledge, therefore, this scoping review attempted to fill this gap in knowledge by summarising the corpus of existent research on the development process behind paper as a means to capture nursing documentation in hospitals in patient care. This was aimed at gaining more than just the technicalities of chart creation: the human and contextual factors that lead to the success or failure of corresponding charts. Evaluating the situation in different institutions and the ways they have resolved the question of designing, implementing, and assessing these tools, the review will bring to the fore effective strategies, identify common pitfalls, and present evidence-based recommendations on future practice.

It is interesting, that most of the reviewed studies followed informal, iterative approach instead of rigorous, user-focused methodology. Although many of these ad hoc solutions had successes in documenting better, there was not the de facto standardization and repeatability necessary to make them useful in a larger setting. As an example, in some studies, just a change in existing charts was made considering internal audits or the opinion of staff, and in others, action research or the quality improvement cycle was used. This work was hardly ever implemented with a systematic needs assessment or co-design values, that actually brings in the involved back-end users into the process.

A new agreement is that the development of paper chart design must not be an after-afterthought but a purposeful, collaborative process, which must include the needs of the users, clinical processes, and organizational direction. Such tools as Human-Centered Design (HCD) supply such a well-organized guide so that the created products may be intuitive, relevant, incorporated in practice easily. HCD stresses on iterative testing, real world feedback and multidisciplinary collaboration which are essential components in the development of forms that are not just functional but also well accepted by clinical staff. Nurses and other healthcare professionals are more likely to adopt the documentation process and thus be more compliant, accurate, and clinically useful should they be involved early enough in providing the documentation.

Further As well, the design of good paper records has ripple effects that extend farther out than direct clinical use. A clearly structured form will be useful as a guide to the electronic system, easier data gathering to be used in a research, and promote institutional objectives related to accreditation and performance enhancement. Paper-based beneficial records can be the best available way of enhancing documentation in scenarios where accessibility to electronic solutions is restricted, and thus the increase of patient outcomes(3).

Finally, it is believed that much attention and investment should be paid to the design of paper-based nursing documentation tools. These tools are by no means obsolete tokens of a pre-digital past: they are still front and center of inpatient care in many settings. Healthcare entities can transform the quality, uniformity, and utility of nursing documentation through drastic measures by adopting the systematic and user-oriented design strategies they learn by reviewing the existing practice. This review provides some basis on which to build such efforts, to say that structured processes, cross-disciplinary involvement, and on-going appraisal are all requirements towards better documentation and better care.

2.Methods

1. Review Framework and Rationale

The development of this scoping review was guided by the generally accepted framework by Arksey and O Malley (2005) whose modification was done by Levac et al. (2010). Such methodological models find extensive use in literature of health sciences to offer an up to date outline of available evidence in a field where the research is varied or onset. The choice of the scoping review (instead of systematic review or meta-analysis) was based on the exploratory nature of the research question: how are paper-based nursing records developed and implemented in inpatient settings in an attempt to improve documentation quality?

Considering the considered heterogeneity of study designs and outcomes, the proposed methodology enabled the authors to trace general patterns, discover gaps in knowledge, and draw the line on current trends in record

development. Furthermore, this review followed the PRISMA Extension for Scoping Reviews (PRISMA-ScR) framework which entails complete reporting, transparency, and replicability of processes, and outcomes.

2. Theorization of Key Terms

In order to conduct the literature search, there were 4 main thematic areas identified: nursing care, documentation, inpatient care, and quality improvement. Selection of these core concepts followed their centrality to the research objective and operationally were made up by combination of controlled vocabulary and free-text terms. Synonyms of related terms were listed to expand the search strategy and retrieve literature that does not necessarily describe a particular term or measure(4).

- Nursing Care was interpreted as the organized process of patients assessment, planning, implementing and assessing treatment and especially recording objective data-vital temperature, slipside groups and so on.
- The term documentation was used to reflect paper forms and did not cover computerized/hybrid systems. Checklists, charts, forms, protocols and flow sheets were related terms.
- Inpatient was considered the most comprehensive as it involved any hospitalized patient even those in emergency departments since documentation practices there resemble those found in inpatient wards.

Quality Improvement included literature that outlined interventions that could be used to improve the structure of records, completeness of records, or usability of records although these interventions were not necessarily described with this terminology.

The definitions served the basis to establish the syntax of the search, eligibility filters, so that the relevant literature could not be omitted because of variation in terminology.

3. Search strategy in literature

Literature search was carried out in August-October 2019 with the help of a medical information specialist. The first search was carried out in PubMed, and the syntax was further modified others with major bibliography databases such as CINAHL, Web of Science and the Cochrane library. To be comprehensive, keyword sets were combined via the utilization of boolean operators. For example:

nursing care OR vital signs AND documentation OR checklist AND inpatient OR hospitalized AND quality improvement OR chart design

In order to complement such systematic search the researchers conducted a free-text search within Google Scholar and used reference snowballing, scanning reference lists of retrieved articles by hand to select those articles that qualified to be included.

Inclusion criteria limited the results to the articles published in English earlier than October 2019. This research was required to examine designing, redesigning or implementation of paper nursing records in contexts of inpatient care, or emergency care. Articles that focused on the electronic systems, nursing handover tools, or anything that related to interpersonal communication tools solely were omitted.

4. Study Screening and Selection Device

The review team performed a two-tiered screening process after duplicates were removed by a combination of automated and manual search based on Endnote X7.8 and Microsoft Excel.

- At Stage 1, two independent reviewers examined all of the titles and abstracts. A study would be chosen to review on a full-text basis when it fit the following criteria:
- It had direct relation to enhancing the quality of documentation in the inpatient nursing.
- It worked on creating or assessing of paper-based documentation tools(5).
- Studies that were unclear at this point were kept to be reviewed in full text to prevent initial rejection.

In Stage 2, one primary reviewer revisited the chosen full-text articles and a secondary reviewer was used to cross-check the findings. Consent was the criteria to be included in the final list. At this step, articles were removed where detailed reporting of the process of chart design is absent or when documentation involved an inpatient nursing setting was not addressed specifically.

The selection process of the research studies was depicted by the PRISMA-ScR flow diagram, which represents the number of research studies found, screened, reviewed in full and finally adopted.

5. Data No. 2 Extraction and Charting

A standardized data extraction tool was created in order to ascertain consistency and rigor in data collection. This instrument was derived based on the Joanna Briggs Institute recommendations of scoping reviews. The form was tested and repeatedly revised to encompass both quantitative and qualitative aspects in fields.

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Data that have been extracted was:

- Examine metadata (e.g. author, year, country, clinical setting)
- Explanation and title chart(s) used
- Phases of design and implementation process
- the use of collaborative or participatory approach
- Impact Pipeline metrics of documentation evaluation
- Reported barriers, facilitators and lessons learnt

Suggestions of future chart design

To control the quality, the data were extracted by two authors through the extraction of two different studies randomly selected and the lead author extracted data in the rest of the studies. Any interpretation differences were ironed out through rooted discussion in the team.

6. Analytical Approach

Synthesis process was narrative, because statistical meta-analysis was not possible due to the heterogeneity of studies results, type of studies and characteristics of the charts. Rather, results were clustered under key themes and organized as per the research questions which were guiding, i.e.:

- What was the reason behind redesigning or coming up with new paper charts?
- Which were the constituents of the documentation tools?
- How did the charts get designed and implemented?
- What were the consequences of such interventions?

Summarizations of study patterns followed to come up with common steps that are involved in design process that includes problem identification, consultation and redesign, pilot testing, implementation and evaluation.

3.Results

Twelve studies were identified to form part of this scoping review, and majority of them were done in high-income countries. In particular, five studies were American, three Australian, two British, one New Zealand and one Ugandan. The studies ranged between 1992 and 2017. Most of them (as a rule) concentrated on the redesign or the introduction of the inpatient nursing documentation tool, usually admission forms or observation charts. These charts were customized in relation to different specialties such as general medical, surgical, and emergency, pediatrics, and oncology healthcare.

The papers involved various issues that lead to the revamping of documentation tools. Typical problems were incomplete or obsolete paper-based forms, duplication of the data entry in a plurality of charts, and inefficiencies in the process of charting that led to low documentation compliance. In a number of cases, this was indicated by staff that the current forms were unsuitable based on newly arising clinical requirements, were insufficient in providing continual support with regard to monitoring of patients, or did not conform to the revised quality and safety standards(6). In subsequent cases, the revision of documentation occurred as a result of an attempt to attain external accreditation or enhance interdisciplinary team communication.

Although different settings and scope were considered, one pattern was observed in the development of the charts. The majority of initiatives adhered to the pattern started by documentation problems identification, followed by inputs of staff or expert groups concerning the design. This would be normally proceeded by the development or the change in the chart, followed by piloting it in selected few wards and finally its implementation upon further development. Some studies reported the existence of formal committees or interdisciplinary teams involved in the redesign whereas some attracted input of nursing leadership or quality improvement teams. Some experiments involved feedback loop and could iteratively be revised relying on user experience at pilot stage.

The documentation tools that were derived were complex and different in design. Others were single part forms with tick-boxes and other structured fields whilst others were multi part booklets with in-depth assessment coposts. The design of the observation charts could be aimed at capturing vital signs of the body including temperature, pulse rate, blood pressure, respiratory rate, and oxygen saturation. Some of these contained visual cues such as color-coded early warning scores and escalation outlines, which would initiate clinical response in the event of recording abnormal values. The format of admission and discharge charts was frequently designed so as to minimize the amount of free-text data one had to enter and maximize the use of standardized assessment entry fields. Other forms were theoretically underpinned by such theoretical approaches as Gordon Functional Health Patterns, especially in the older studies.

Regarding implementation, various studies had systematic roll-out strategies that involved workforce training, learning activities, and visual aids in a form of posters and explanatory text. All this was done with the objective of making sure that the nurses know how to use the new documentation tools appropriately and on continuous basis. Some institutions have selected documentation champions or coordinators who monitor the adoption process. Besides the training, there were several projects that placed supporting interventions i.e. clinical policy changes or even the emergency team protocols to remind the purpose and use of the new charts(7).

The interventions were evaluated two months to three years, and they were post-implementation. In a majority of the studies, positive results were recorded. Among these was an increase in documentation completeness, the recording of the vital signs more frequently, the charting accuracy increased and the populations of the missing and irregular entries decreased. In certain instances, the amount of documentation compliance increased considerably with the arrival of the re-designed forms. An approximate 50 percent saving in time used to carry documentation by the doctors was recorded by one of the studies, implying advancement in efficiency of the work closely. The other major advantage experienced came as a result of structured and ongoing charting where they were able to follow the patients more closely and detect deterioration faster through time.

Even though the majority of studies emphasized positive results, several of them also disclosed the implementation issues. The obstacles counted the unwillingness of nursing personnel not well acquainted with the new tools, the inability to incorporate the charts into the existing regimes, and insufficient resources to both train properly in the long term and print the charts. On the other hand, the aspects that facilitated a successful implementation involved the participation of staff in the designing phase, the simplification of the chart design, integration into the overall institutional goals as well as the provision of viable training sessions(8). The feedback aspect during the implementation was also useful in the improvement of the tools and making them get acceptance.

A cumulative effect of the results indicates that in the case of paper-based nursing documentation, even a slight simplification and reorganization of design and structure can yield measurable results regarding more complete, accurate, and user-friendly records. According to the review, the structured development processes particularly where there is involvement of collaboration with the end users are more likely to produce tools which are accepted and can be successfully incorporated in clinical practice.

4. Discussion

The results of the present review provide a meaningful insight into how paper-based nursing documentation tools can be conceptualized, structured and implemented at inpatient hospitals. This review has also confirmed that although attention is now given to digital health records it is clear that paper charts remain an important component of clinical documentation especially where there are no or inadequate electronic systems, where systems are neglected or used inconsistently. In highly technological health systems, some paper instruments (bedside observation charts) are highly used because they are easy to operate in evolving situations and clinical emergencies.

The truth that one can deduce out of the studies made is that the majority of developing paper chart processes are loosely organized and problem-oriented. Redesign efforts are subsequently undertaken by the institutions after the gaps in documentation or the inefficiency is realized without proactive and long-term planning of the same. Such projects have the propensity to result in some desirable results, e.g. enhanced perfection of records or the level of user satisfaction but are quite often lacking in consistency and rigor of approach that a designed framework would ensure. Such variety can reduce the applicability of these interventions or their sustainability over time, departmentally or facility-wise(9).

Absence of systematic design processes is particularly remarkable. The majority of chart development attempts included at least some elements of staff consultation, including staff feedback in some contexts, but less than half included either a co-design process that iterates over the design, or separate user testing as part of the chart life cycle. One such methodology that is not mentioned often in reviewed studies is Human-Centered Design (HCD) and yet known to be effective in innovation in health systems. Ideas that match well with the identified challenges in chart adoption and utilization are learning about user needs, including the users in the solution development, and fix what works based on user responses, which is all embodied in the principles of HCD. The increased involvement of HCD or phenomena of the kind might become the cause of more user-friendly, yet more robust documentation tools in terms of their functionality.

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In addition, the review indicates that a properly created chart is not the only thing that determines a successful implementation. Key elements are institutional support, formal employee training and alignment of policies. The introduction of charts as part of a training program, standard operating procedures, or the larger movement toward quality improvement would lead to higher rates of adoption and greater evidence of the introduction. The less dramatic improvements were observed on the other hand in projects that were exclusively aimed at re-designing the form (but not giving it the institutional infrastructure that was necessary to back up changes in behavior). This fact suggests that to the same amount to which the form design influences documentation quality, so do organizational culture and systems readiness.

Notably, the review notes the twofold purpose that well-designed paper charts may serve: of course, they enhance the quality of immediate documentation, but they also can be used as templates in the future electronic documentation systems(10). To solve this problem, in most low- and middle-income countries, in which full digitalization is still a long-term objective, the timing should be taken to invest in efficient paper-based systems and fill the gap till further evolution into digital transitions. The conversion to the electronic health record system may be facilitated through introduction of the paper forms that mirror the design of data fields that are standardized, clinical reasoning, and structured direction within workflows to create well-standing documentation patterns and data anticipation.

However, there were also some limitations extracted in the literature. Although the majority of studies noted the positive effects on documentation practices after the intervention, not many of them have gone into patient-level work or the clinical implications of the changes. Whether improvement of documentation, in itself, can be associated with quantifiable patient safety, treatment timeliness, or outcome improvements remains unclear, although it is a common assumption that documentation improvement is one of its facilitators. There was also limited long-term follow up data. There were limited studies investigating the sustainability of documentation improvement after one year and it is not clear whether the value of improved documents through redesigned charts are sustainable in the long term or lost due to turnover among the staff, changes in protocols, or burnout of the system.

In the face of these results, a few implications emerge when considering clinical leaders, hospital administrators, as well as the designers of healthcare systems. To begin with, healthcare facilities planning to develop or revise the documentation tools based on paper may find it worthwhile to employ structured design approaches: Human-Centered Design, participatory co-creation or quality improvement cycles to consider the needs of both the clinical and the user-based populations. Secondly, the plans to implement the form must go beyond distribution of forms to include formidable training, feedback and observational channels. At last, documentation reform must be considered a change in a system rather than just a change in documentation, within institutional priorities, including patient safety, workflow efficiency, and digital readiness.

To summarize, although the digitalization of the healthcare industry is the aim of all countries, electronic nursing documentation has not transcended into the clinical setting in a variety of facilities. This review shows that well engineered paper charts, which are evidence based and developed in close association with the user, can greatly improve the quality and efficiency of nursing documentation. Future efforts ought not only to concentrate in streamlining the design process but additionally, segue the outcomes of those efforts and also guarantee that the paper documentation of patient care advancement does not undoubtedly become an unreliable, inapplicable, or contextually contested tool in patient care continuum.

5. Conclusion and Future work

The scoping review demonstrates the significance of well-designed paper-based nursing records that remain highly relevant in achieving high-quality documentation in the hospital inpatient environment. Even though the world is enjoying an ever-growing trend of digitization, paper is still a common method to record patient care events, especially in facilities with poor infrastructure or clinics that still need to adapt digitally-integrated systems into daily practice. A review also shows that careful, planned construction of these paper tools can considerably enhance the accuracy, comprehensiveness, and usability of nursing documentation, thereby facilitate more effective communications, continuity, and care, and clinical decision-making.

In reviewing all the studies, there came out one common denominator mostly a concept that most documentation improvement processes were started due to local problems like missing parts to records, charting or date laden forms. Although most of these projects were successful in meeting urgent issues, most of them did not have a

systematic outlook on design. User-centered and participatory research designs, like Human-Centered Design, were given minimal attention, despite the fact that such designs would enhance the relevance, usability and the effectiveness in the long term of tools designed. Thinking more in terms of models and cycles of development including end-users would probably produce sounder and more generally acceptable documentation systems.

Moreover, the review signals the fact that the implementation of a new or the revised paper chart is not enough in isolation to ascertain the practice of better documentation. These need to be implemented effectively (assisted in the implementation by thorough staff training, clear institutional policies, constant feedback systems, and consistency with the greater organizational aims). The studies whereby the documentation tool was matched with the assistance of a wider quality improvement approach, like improved escalation protocols, or audit-feedback loops, had the strongest preliminary results in relation to developments in documentation quality through time.

Noteworthy, as a direct impact, increased documentation was often addressed, but downstream impact, including patient safety or clinical outcomes analysis, was scarce. Since the use of paper-based documentation remains a transitional measure on the way to a more digital future, particularly in low-resource settings, future studies are urgently required to help build bridges between the quality of documentation and improvements in actual care delivery and patient welfare.

To sum up, this review confirms that it is worthwhile and essential to enhance the work on the design and implementation of paper-based nursing records in myriads of healthcare systems. Properly designed paper charts and the supportive implementation practices when based on the user needs can be transformational and can help to promote the nursing documentation standards. On the one hand, to go forward, healthcare institutions need to place a particular emphasis on the evidence-informed and participatory design approaches and ensure that the redesign of the chart is not a unique intervention, but a component of integrated work to reinforce the work of health systems.

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Conflicts of interest

The authors have no conflicts of interest to declare

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