OPTIMIZING INFORMATION FORMS AIMED AT IMPROVING THE QUALITY OF HEALTH CARE

Shahla FOOZONKHAI1, Zahra MAHMODI2
1PhD, Assistant professor of Department of Health Information Technology Assessment, Standardization and Tariff Setting, Iranian Ministry of Health and Education, Tehran, Iran
2B.S. Health & Treatment Center of Iran University of medical sciences, Tehran, Iran

INTRODUCTION

Forms are a necessary part of the clinical records and are supposed to gather correct and substantial data. The data maintained within the clinical records is employed to encourage interaction among medical experts in their plan of continuous patient treatment, guaranteeing a correct order of that treatment. The data in the clinical records might be utilized, likewise, for a range of lawful purposes, analysis, clinical training and assessment of payment system [1].

Customarily, doctors hear the mantra, “In the event that it isn't recorded in the clinical record, it didn't occur.” This is important that suitably gathering a patient's medical condition impacts how healthcare centers are repaid under the payment system [2]. In addition, obligation regarding patient treatment should be passed with certainty and assurance while guaranteeing that essential data is not dropped [3].

The documentation structure of the form may lead to documentation burden. A few forms are excessively problematic or similar data might be required on different forms in a similar patient health record, making additional work for the staff and at times conflicting data [9]. That contrarily influences progression of treatment and can lead to conflicting occasions, irregularity of treatment and poor results [3,10]. Patterns in patient’s treatment—including diagnosis, procedures, and reaction to care can be evaluated to assess adequacy of care, however; when this data is missing, the development opportunities hard to apply for quality enhancement groups [9]. Discharge summaries as one of the medical record forms, are a vital peace of healthcare facilities transitions [4–7]. On time documenting of discharge form is necessary in the Netherlands to help patient care integration [8]. However, these forms are typically don't embrace appropriate pertinent details of hospitalization and non-standard records [5].

Krippalani, et al indicated that the accessibility of a discharge summary after readmission of the patient was low and stayed poor, influencing the nature of treatment in around 25% of follow-up visits and adding to essential doctor’s disappointment [3]. Analysis on documentation of the discharge summary form has systematically discovered that they are generally non-standard forms with different quality and additionally absence of vital items [3,11].

Despite the existence of patient's information at the previous treatment center, the staff at the next health center should ask the information from the patient, which leads to waste time and resources. The absence of right and convenient information will result in poor decisions in clinical practice, prescription blunders, unnecessary tests, redundant referrals, and usually waste of time and other assets [9]. So the healthcare facility fail to supply vital data, like, updated prescription records, investigate test results and unfinished test outcomes [12,13]. This is maybe due to absence of legal instructions in regard to documenting discharge summary forms [14].

Easy access to correct information are requirements for implementing any new payment system [15]. Standards for managing information included: (a) data content and use, and (b) data management [9]. The Ministry of Health and Medical Education (MOHME) is responsible to deliver health care services and medical education on behalf of Iranian government. So for redesigning the forms, we began with medical record content. Medical record forms were outdated and weren’t based on the payment system requirements. Meanwhile, the unofficial reports were received from health information management community that medical records did not cover needed data. However, the main drive for the redesign medical record forms was the need for implementation of the new payment system in Iran.

Background: The medical record forms are becoming outdated and need to update and comply with international efforts and health care requirements future payment system. Redesigning medical record forms could result in complying current demands.

Methods: The Iran Ministry of Health detected known barriers in the current medical record forms and redesigned medical records forms, to address those barriers through taking into account the views of stakeholders, experts and international efforts.

Results: The interventions categorized in four different categories: changed, unchanged, deleted and added. Unchanged items used again in the designed forms; if there are slight changes such as changing sub-categories of items, the items will be in the changed category. No stakeholders or specialist or international studies approve the deleted items. Added items included in the forms based on the study results.

Conclusion: This study has narrowed the gap between current form and international efforts. This study identifies the forms current situation and based on requirements and other country’s experience, the final forms designed.

Keywords: Redesign, medical record forms, national, international

ORGANIZATIONAL MANAGEMENT
METHODOLOGY

The general goals of this project are generation of a new medical record forms to improve the quality of care in health care system, reduce the cost related to unnecessary data and support implementation of new payment system in Iran. For this, we start with “Admission & Discharge” and “Discharge Summary” forms. Development and refinement of these forms performed based on three main steps including: (1) Focus group discussion for need analysis (2) Literature review (3) Redesign forms

(1) Focus group discussion for need analysis
A key element of the redesign methodology is determining the needs and expectations of clients [9]. This study used the focus group method to explore participants prospective toward importance of the each forms items. Medical record forms alternation necessitates the contribution of variety of stakeholders. In this study, stakeholders included individuals who provide or use information of the “Admission & Discharge” and “Discharge Summary” forms.

Table 1: Participant’s characteristics (n = 30), and HIM professors (n = 5).

<table>
<thead>
<tr>
<th>Stakeholder characteristics</th>
<th>Participants (no.)</th>
<th>Participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head of HIM department</td>
<td>15</td>
<td>50%</td>
</tr>
<tr>
<td>Admission and discharge department staff</td>
<td>8</td>
<td>26.7%</td>
</tr>
<tr>
<td>Clinical coders</td>
<td>2</td>
<td>6.7%</td>
</tr>
<tr>
<td>GP</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Insurance staff</td>
<td>2</td>
<td>6.7%</td>
</tr>
<tr>
<td>HIM professors</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

The participants was comprised of thirty stakeholders, who have working experience in hospitals and five Health Information Management (HIM) professors. The majority of participants were head of HIM (50%), while the remaining participants in order were Admission and Discharge department staff, GP, Clinical coders and Insurance staff. A total of thirty participants were divided into four groups.

In this phase, current “Admission & Discharge” and “Discharge Summary” forms items are import into the excel file. The stakeholders invited to participate in focus group discussion meetings for analyzing items. The introduction meeting conducted and “current problems in the field of health information management”, “role of gathering right data” and “importance of the medical record forms”, and “goals of the project” explained. The Likert scale used for asking stakeholder’s opinion; in addition of selecting a scale, they should give a reason for their choice and convey the group about it. Overall, four focus group discussion sessions were held.

(2) Literature review
A review of the literature documenting development and refinement medical record forms in other countries was conducted using PubMed, Sciedirect, Google and Google scholar. We intended to obtain lessons that have been used by other countries, agencies or organizations. After reviewing related documents and extracting data set needed to develop and refinement medical record forms. We thereafter conducted a content analysis to reveal data needed on the “Admission & Discharge” and “Discharge Summary” forms. Finally, this analysis identifies data set in different countries.

(3) Redesign forms

Content analysis
Following focus group discussion for analyzing and also doing literature review, the items divided to four categories. Then, to make required change and amendment, participants invited for express their opinions, before meeting; the categorized items was sent for them through email. A total of thirty stakeholders participated in a focus group discussion meetings. Data were collected during the focus group meetings. If group could come up with agreement, that items included in the group and if they could not, the items was tagged for further discussions and evaluation.

Developing final forms
Confirming the integrity and accuracy of the final forms is one of the most important phases of the projects. This step evaluates the proposed forms designed while taking into account all stakeholder’s and academic member’s view. For this, the third round of meetings conducted with the stakeholders and also HIM professors, before the meeting the draft forms were submitted to all members. After meeting, all views gathered, each section of the forms was read and then asked participants one by one about items in each section.

RESULTS

(1) Focus group discussion for need analysis
The responses were analyzed using descriptive statistics, after focus group discussion, participants expressed their opinions regarding the new forms items. Forty-three items were identified from the Admission and Discharge form. The results are shown in Figure 1.

As shown in Fig. 1, participants are “strongly agreed” with the following items on the form: Medical record number, family name, name, father name, sex, date of birth, birthplace, home address, phone & mobile no, companion or patient references, address, phone & mobile No, expired: date, time, expired before 24 h, after 24 h, cause of death, final diagnosis, external causes, operation & other procedures, recommendation on discharge, admitting physician, admission, discharge, admission type, name of Police station informed, transfer from ward to ward, transfer from hospital to hospital, transfer date, insurance plan name, insurance type, length of stay. So need to refinement other items remaining.

Twenty-three items were identified from the discharge summary form. The results are shown in Figure 2.

The participants were strongly agreed with the following: Medical record number, family name, name, father Name, sex, maternal status, date of birth, admitting physician, home address, phone & mobile no, principal
diagnosis, medical & surgical procedures, results of paramedical examination, disease progress, patient's condition on discharge, recommendation after discharge, admission times, discharge time. So should amendate the rest of items.

(2) Literature review

Kind, et al indicated, at least, discharge summary ought to contain the succeeding: diagnosis (admission and other), related past clinical history and physical discoveries, hospitalization’s date, treatment gave, concise course of hospitalization, results of techniques and unusual lab test results, suggestions of any subspecialty specialists, Information provided to the patient and family, The patient's situation or practical status at discharge, arranged discharge medication routine, with purposes behind any progressions and explanations for new medications, follow-up plans made.

Explicit follow-up requirements, containing arrangements or procedures to be booked, and tests delayed at discharge, identification data of the physician who was responsible [3]. But no explicit and definite definition exists for these items [20].
Documents, reports and forms of the Australia, Canada, Ireland, Scotland, UK, New Zealand studied [21–30]. As presented in Table 1, after content analysis found out that the following information are needed and missing in the current “Admission and Discharge” and “Discharge summary” forms:

Table 2: The content analysis of the documents, reports and forms

<table>
<thead>
<tr>
<th>Admission &amp; Discharge</th>
<th>Discharge Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Age</td>
</tr>
<tr>
<td>Patient identification number</td>
<td>Patient identification number</td>
</tr>
<tr>
<td>Admission diagnosis</td>
<td>Admission diagnosis</td>
</tr>
<tr>
<td>Principal diagnosis</td>
<td>Hospital details (Address and Telephone)</td>
</tr>
<tr>
<td>Discharge destination</td>
<td>Secondary diagnoses</td>
</tr>
<tr>
<td>Comorbidities</td>
<td>Complications</td>
</tr>
<tr>
<td>Complications</td>
<td>Principal diagnosis</td>
</tr>
<tr>
<td>Principal diagnosis</td>
<td>Past medical history</td>
</tr>
<tr>
<td>comorbidities</td>
<td>Allergies/ adverse reactions (Substance/Agent, Reaction type, Clinical manifestation)</td>
</tr>
<tr>
<td>Principal Medical &amp; Surgical Procedure</td>
<td>Test (name, Date, Result)</td>
</tr>
<tr>
<td>Additional Medical &amp; Surgical Procedures</td>
<td>Medicines on discharge</td>
</tr>
<tr>
<td>Main cause of death</td>
<td>Comorbidities</td>
</tr>
<tr>
<td>Main cause of death code</td>
<td>Principal Medical &amp; Surgical Procedure:</td>
</tr>
<tr>
<td></td>
<td>Additional Medical &amp; Surgical Procedures</td>
</tr>
<tr>
<td></td>
<td>Follow-up / plan</td>
</tr>
</tbody>
</table>

(3) Redesign forms
A redesign methodology has been developed in order to fulfill the stakeholder’s needs and requirements and also adjust with the internal efforts:

1. Content analysis
The forms items categorized in four groups: unchanged, changed, added and deleted based on the two previous steps. Some items indicated as necessary and don’t need to change, some items required but need some changes, then focus group meeting held, and participants asked about the items in each category.

Some main changes in the “Admission and Discharge form”

Changed: “Final principal” changed to the “principal diagnosis”, to comply with the international theme. In 2013 Germany started a new financial system for the inpatient cure of mental issues. The primary implementation of the system showed that the principal diagnosis to be the fundamental variable in grouping. Furthermore, they discovered the inadequately of the exact meaning of the task of the principal diagnosis in the standards for coding - and so controversy between health care facilities and health insurance [31]. Indeed, in any case, principal diagnosis is commonly characterized as the principle explanation behind the patient’s stay in hospital [16].

“Sex: man and woman” changed to “sex: male and female”, to use these for kids too.

“Marital status: single and married”, changed to “marital status: single, married or other”, other added to include divorce, widow and other forms of marital status.

“patient discharge status: recovered, some improvement, expired, discharge without physician's order, follow up” changed to “patient discharge status: routine discharge, discharged to an outpatient facility, home care, expired, left against medical advice or discontinued care, refer to rehabilitation facilities, refer to other facilities, ran away to better reflect the patient status on discharge.”

Deleted: Hospitalization history deleted because the number of hospitalizations indicates this item; Birth Certificate No. and Place of issuance of ID card that are no longer used; workplace, Lab.& X-Rays (results) and Interim diagnosis that do not have an explicit definition; the question of whether patient have consultation or not is deleted; the number of consultations indicates the number of consultations, and if not done, the number is assigned zero; recommendation on Discharge because of this form target, deleted from the form.

Added: Patient identification No. to identify the patient in the hospital; national ID that replace birth certificate No; age especially for indicating infant and newborn age; have complementary insurance: patients with complementary insurance don’t get financial aids so it is important in admission indicate that patient has a complementary insurance or not; main cause of death and main cause of death code added.

Main changes in the “Discharge Summary form”
Some items didn’t change, some items that have been changed are:

Changed: “chief complaint of the patient & primary diagnosis” separated to “chief complaint” and “admission diagnosis”, “operation & other procedures” separated to “principal medical & surgical procedure” and “additional medical & surgical procedures”; “disease progress” changed to “clinical situation summary”; “recommendation after discharge” separated to “recommendation after discharge” and “follow-up/plan”. A national study of hospital treatment showed that just half of patients with congestive heart failure got documented guidelines at discharge [32].

Deleted: clinic no., bed and room deleted from the form.

Added: clinic no., bed and room deleted from the form.

Identification data, regulatory factors, age, sex, status on discharge (with the exception of Korea and Japan), and weight in birth of neonates (aside from Korea) are regularly considered [16].
2. Developing final forms

Discharge summaries ought to be organized with subheadings to sort out and highlight the data most appropriate to catch up and to guarantee that every single basic subject are marked [3]. For this the “Admission and Discharge form” sort based on the specific headings: the patient identification, admission detail, intra hospital transfer, clinical details and coding, expired/transfer/discharge details and the “Discharge summary form” sort based on the specific headings: the patient identification, admission/discharge or expired detail, intra hospital transfer, problem/diagnosis/procedures details, tests details, medicines on discharge, allergies/adverse reactions, recommendation after discharge.

After designing the forms based on the previous steps, for ensuring integrity and accuracy, the forms are finalized and the third round of meetings conducted and based on the views the final forms are redesigned as the following Figure 3 and Figure 4.
guaranteeing accessibility of a total summary at the visit for post clinic follow-up [7]. Prins, et al in their article depicts the upgrade and assessment of diagnosis documentation and discharge letter documenting at a Dutch pediatric office. The pediatricians at this office documented form of discharge. Pediatricians currently document codes and related diagnosis in a unique heading of the discharge letter. The clinical record coder controls and remedies this diagnosis heading [8]. Because of the importance of the views of stakeholders and professionals and the use of international experiences, the stakeholder’s view and also international experiences gathered resulting in categorizing the forms items in the following categories: Unchanged, changed, deleted and added. The draft form designed based on these categories and stakeholders and HIM professionals asked again for their ideas and then the final forms have designed.

Lenert, et al proposed the SBAR (Situation-Background-Assessment-Recommendation) for discharge summary. Modifying the discharge summary’s template from narration to a supply model would move its concentration to collective treatment and the following health care professional. Frequently, discharge summaries give incredible fact about the patient hospitalization center, but give the least helpful data to outpatient suppliers who see the patient based on the follow-up plan. Rather than a summary of past patient care history, discharge summary ought to include a key arrangement for future treatment. Experiences and uncertain issues from the hospitalization would be talked about. What's more, discharge summary would incorporate a projection (i.e. an expectation) of how the author thinks patients' clinical condition will get better after some time [33]. Smith, et al to plan and execute an improved summary of discharge for use by internal medical professionals and assess its effect, an improved summary of discharge format were evaluated. Ten items evaluated including enhanced documentation, containing reported requirement for follow-up tests, subjective status, code situation, and relationship with the following health care professionals. Clinical professionals’ revealed enhanced fulfillment with the improved discharge summary contrasted with the earlier format. An improved discharge summary, intended to fill in as a tool among inpatient and outpatient suppliers has enhanced quality without negative impacts on record length, time to documenting or doctor fulfillment [34].

The main goal of the redesign methodology presented in this study was to improve the care quality and support future payment system. Standardized forms may encourage more opportune exchange of appropriate patient data to essential care doctors and make discharge summaries more reliably accessible during follow-up care [3]. The result of this study widely applicable to the redesign of other medical record forms.

After designing the forms, the “Documentation, coding and HIS instruction” regarding these forms and data dictionary to define each form’s element were developed.

D I S C U S S I O N

In Iran, in order to update medical record forms, the redesign methodology applied. The discharge summary is a most important reports in clinical treatment settings, however it is inclined to deliberate omissions that deal with the coherence of the cure. Irregularity is cultivated not just by fragmented incorporation of information, also by inability to record clinical thinking and incomplete diagnosis plan [33]. Deficiencies in data exchange of the discharge summary are typical and may unfavorably influence patient health, also wrong data about the hospitalization can lead to false clinical basic decisions or inability to sufficiently screen a patient's condition during follow-up care. To advance patient care at care transitions, the opportuneness, precision, and significance of discharge interchanges must be made enhanced [3,20]. “Admission and Discharge” & “Discharge summary” forms has selected to start this process.
Robelia, et al in their survey recognized lacks in the discharge summary. Just a fourth of respondents revealed that the HDS (Hospital Discharge Summary) contained all data required. Endeavors should concentrate on
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30. Canberra Hospital and health services. Discharge Summary Completion SOP.Canberra Hospital and Health Services Operational Procedure. 2018.