Awareness of diagnosis and follow up care after discharge from the Emergency Department

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\textbf{ABSTRACT}

\textit{Background:} Patients currently receive discharge summaries including investigation results, medical assessment and follow up requirements with health professionals on discharge from the emergency department (ED). This study aimed to evaluate if a simplified discharge information card in addition to current care improved patients’ awareness of their discharge diagnosis and requirements for follow-up appointment.

\textit{Methods:} A prospective pre-post design interventional study was conducted. The pre-intervention phase collected data from patients who did not receive the discharge card. The post-intervention phase occurred after implementing the discharge card. Participants underwent brief interviews to assess awareness of diagnosis and follow-up appointment requirements after discharge. Responses were compared to the plan in the medical notes and concordance determined.

\textit{Results:} There were 112 patients in the pre-intervention group and 117 in the post-intervention group. Awareness of discharge diagnosis improved from 73.2\% (95\% CI: 64.3–80.5) of pre-interventions participants to 89.7\% (95\% CI: 82.9–94.0) for participants receiving the discharge card (p < 0.001; NNT 6.1 patients). Statistically significant improvements were observed regarding knowledge of follow-up destination and timing.

\textit{Conclusion:} A short discharge information card improved awareness of discharge diagnoses and follow-up requirements. Such interventions that empower patients with knowledge about their health, should be considered prior to discharge from EDs.

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1. Introduction

The majority of patients seen in an emergency department (ED) will be sent home with a small proportion being admitted \cite{1}. Therefore, patients are often discharged without complete management of their medical condition, requiring follow-up care. Previous studies have demonstrated substantial deficiencies in patients’ awareness of their discharge diagnosis and follow up plan \cite{2–5}.

On discharge from the ED, most hospitals provide verbal discharge instructions and a written discharge summary directed at the local medical officer / general practitioner and / or other specialist health practitioner. The discharge summary is often an extensive document including laboratory and radiology results, medical assessment and follow up requirements, containing medical jargon. The risk of inadequate comprehension at the discharge phase to the patient regarding their healthcare can result in poor health outcomes for them, reduced compliance of the treatment and follow-up plan and therefore increased subsequent use of health resources and potentially representation to the ED \cite{6}.

A systematic review has found health literacy to be a problem amongst patients \cite{7}. Patients with poor awareness of their healthcare needs were found to have an increased chance of ED visit, higher ED costs, and substitute an ED visit for routine primary care physician visits \cite{7}. Written discharge instructions may aid in improving communication between the healthcare provider and the patient in order to optimise a patient’s self-management after discharge from the ED \cite{6,8}. There is an acknowledgement that a combination of written and verbal discharge instructions are

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required for effective discharge processes and to optimise discharge education from the ED [6,9,10].

2. Aim

To assess the effectiveness of a simplified discharge information card in addition to current standard care to improve patients’ awareness of their discharge diagnosis and requirements for a follow-up appointment after discharge from the ED.

3. Methods

3.1. Design

A prospective pre-post samples interventional study was conducted. Two data collection stages were undertaken, pre and post the implementation of the discharge information card. In the first stage, interview data were collected from patients who did not receive the discharge information card intervention. The second data collection period occurred after implementation of the intervention. The pre- and post-intervention group consisted of different participants and were recruited using convenience sampling. Participants were interviewed by the researcher after they had received their discharge education from their treating health professional, prior to exiting the ED.

3.2. Setting

The setting for this study was a major tertiary ED with an annual census of over 60,000 presentations.

3.3. Participants

The population studied in this research are the patients discharged home from the Emergency Short Stay Unit (ESSU) or Cubicles area in the ED. Included patients were likely to have undergone investigations and tests, e.g. pathology, radiology such as computed tomography or ultrasound scans) and assessment and treatment of symptoms such as pain and nausea. They may have been reviewed by inpatient specialties during their time in these areas. Patients were excluded who were admitted to an inpatient team.

3.4. Recruitment

The study used convenience sampling to recruit participants. Potential participants were approached by the investigator undertaking data collection just prior to them leaving the Department to go home, after they had received their discharge instructions (written and/or verbal) from their treating practitioner.

The inclusion criteria were patients discharged home from the ESSU and the Cubicles. The exclusion criteria were patients with cognitive impairment, intellectual disability, those with acute mental illness, patients ages <18 years and non-English speaking patients. Patients who discharged against medical advice were excluded as they were not following the recommended treatment plan in ED and transfer of care post discharge.

Recruitment for the pre-intervention cohort occurred between 8th September 2017 and 20th December 2017. Recruitment for the post-intervention cohort occurred between 15th March 2018 and 17th June 2018.

3.5. Intervention

The intervention was compared to the standard care of discharge processes that the population receive. Under the standard care patients receive verbal discharge instructions and a written discharge summary. The written document entails an extensive two-page medical discharge summary including pathology, radiology results, medical assessment and follow-up requirements with a General Practitioner or Outpatient Specialist. The paperwork is intended to be given to the receiving GP or outpatient specialist, thus, the language used includes medical terminology and test results that may be incomprehensible to a non-health professional.

The intervention in the study was the discharge information card, containing information on discharge diagnosis, follow-up appointment requirements and the arrangements for booking the appointment, namely when the appointment is or should be and who is arranging it, the hospital or the patient (Fig. 1).

The discharge information card was given to patients by the Health Professional discharging them in addition to the usual discharge paperwork that patients received. Doctors and Nurse Practitioners are responsible for the formal discharge instructions both verbal and written. The discharging health professional was prompted that the card was for the patient’s reference and to act as a follow-up appointment reminder for the patient, unlike the two-page medical discharge summary which was intended for the receiving health professional on discharge.

It was left up to the discharging practitioner how to introduce the card during the discharge conversation. The discharging health professional wrote on the card the patient’s discharge diagnosis, which health professional they need to see for a follow-up appointment (e.g. GP, Outpatient Specialist or not applicable) and when the appointment was or should be.

The card was the size of a business card (less than A6 in size) and is intended to look like an appointment card that one would...
receive from a Doctor’s rooms or hairdressers. The card used simple language that can be easily understood and was is in paper form.

3.6. Outcome measures

The primary outcome measure was the patient’s response of their awareness of their discharge diagnosis, recorded by the investigator-initiated interview at time of patient discharge, and its concordance with the documented discharge diagnosis in the medical notes. The secondary outcome was the patient’s awareness of their requirements and arrangement of a follow-up appointment with a health professional and its concordance with the plan documented in the medical notes. The secondary outcome consisted of which health professional they need to see, when the appointment should be arranged for and who is arranging the appointment - the patient or the hospital. Data were gathered regarding diagnosis from the diagnosis section of medical notes and clinical impression section, from anywhere in the medical notes or the discharge summary if one had been formulated.

Two of the study investigators independently conducted concordance determination on the data using the basic principles of; if it was not documented, then it was not done; the patients language needed to loosely match the medical language used; and all aspects of discharge information needed to be mentioned. The third author also was involved in determination of concordance if the two authors disagreed. If data was missing in the medical notes or discharge summary it was documented as missing. However, if the data was on the discharge information card this data could be used to determine the concordance of the patient’s response. Table 1 illustrates concordance determination examples.

<table>
<thead>
<tr>
<th>Question</th>
<th>Patient Interview</th>
<th>Chart/Discharge information card review (in post intervention data)</th>
<th>Rating given</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your diagnosis?</td>
<td>Kidney infection</td>
<td>Pyelonephritis</td>
<td>Concordance</td>
</tr>
<tr>
<td>What is your diagnosis?</td>
<td>Dehydration</td>
<td>Benign paroxysmal positional vertigo</td>
<td>No concordance</td>
</tr>
<tr>
<td>Do you need a follow-up appointment with a health professional? And if so who?</td>
<td>GP</td>
<td>GP and return if symptoms worsen, pain, swelling pus at wound site.</td>
<td>No concordance</td>
</tr>
<tr>
<td>Do you need a follow-up appointment with a health professional? And if so who?</td>
<td>Heart doctors at the hospital and heart scan</td>
<td>Cardiology Outpatient and myocardial scan</td>
<td>Concordance</td>
</tr>
<tr>
<td>When is the appointment / or when should it be arranged for?</td>
<td>In 2 days’ time</td>
<td>No documentation</td>
<td>Missing data</td>
</tr>
<tr>
<td>When is the appointment / or when should it be arranged for?</td>
<td>On Tuesday</td>
<td>Tuesday (written on discharge information card)</td>
<td>Concordance</td>
</tr>
<tr>
<td>How is this appointment going to be arranged?</td>
<td>By me</td>
<td>Patient to arrange GP appointment</td>
<td>Concordance</td>
</tr>
<tr>
<td>How is this appointment going to be arranged?</td>
<td>I do not know</td>
<td>Referral made to outpatients, patient will receive a letter.</td>
<td>No concordance</td>
</tr>
</tbody>
</table>

Continuous data were reported as means (standard deviations). Ordinal data was reported as medians (interquartile ranges). Binary data were reported as frequencies (percentages). The association between the exposure and primary outcome was presented using odds ratios (with 95% confidence intervals). Statistical significance of difference in means was evaluated using the Student’s t-test, and difference in medians was evaluated using the Wilcoxon rank-sum test. The differences between categorical variables were assessed using the chi-square test or if value in a cell was less than 5, Fisher’s exact test was used. A p-value of <0.05 was considered to be statistically significant.

In order to detect a minimum clinically significant difference to 95% concordance with medical records, using a level of significance (alpha) of 0.05 and 90% power, it was calculated that a sample size of 112 participants were required to be interviewed pre-and post the intervention in the study, 224 in total. All analyses were conducted with Stata® v 11.3 (College Station, Texas) software.

The study was approved by relevant hospital and University Human Ethics Committee (Project number 398/17). Participants gave verbal and implied consent after a description of the study was given by the interviewer. Participants were given a Patient Information and Withdrawal form with full explanation of the study to take home to read and with options to withdraw via mail, phone and email if desired.

4. Results

A total of 229 patients were included into the study, 112 in the pre-intervention group and 117 in the post-intervention group. Both groups had similar demographic characteristics of age, sex, social situation, and Charlson co-morbidity index (Table 2).

In terms of the geographical setting where the patient was discharged from (ESSU or Cubicles), social situation, triage category there was no statistically significant difference between pre and post intervention groups. There was missing data for documented social situation in the notes for 61 (54.5%) of participants for the pre-intervention group and for 56 (47.9%) for the post intervention group.

There was a statistically significant difference (p = 0.02) between the pre and post interventions regarding the time of discharge. The number of participants that were discharged out of hours in the pre-intervention group was 48(42.9%) versus 33(28.2%) of participants in the post intervention group. In three cases in the pre-intervention cohort, nil diagnosis was made and there was one case of missing data. There were no cases of missing data or participants that did not get given a diagnosis in the post-intervention group.
Table 2
Demographics and management variables.

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention (n = 112)</th>
<th>Post-intervention (n = 117)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>43.1 (19.6)</td>
<td>46.6 (20.1)</td>
<td>0.18</td>
</tr>
<tr>
<td>Gender (Male)</td>
<td>55 (49.1 %)</td>
<td>46 (39.3 %)</td>
<td>0.14</td>
</tr>
<tr>
<td>Social situation</td>
<td></td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td>Home alone - n (%)</td>
<td>13 (11.6 %)</td>
<td>9 (7.7 %)</td>
<td></td>
</tr>
<tr>
<td>Home with family - n (%)</td>
<td>36 (32.1 %)</td>
<td>50 (42.7 %)</td>
<td></td>
</tr>
<tr>
<td>Nursing Home - n (%)</td>
<td>0 (0 %)</td>
<td>1 (0.9 %)</td>
<td></td>
</tr>
<tr>
<td>Supported</td>
<td>1 (0.9 %)</td>
<td>0 (0 %)</td>
<td></td>
</tr>
<tr>
<td>Accommodation - n (%)</td>
<td>1 (0.9 %)</td>
<td>1 (0.9 %)</td>
<td></td>
</tr>
<tr>
<td>No Fixed Abode - n (%)</td>
<td>0 (0 %)</td>
<td>0 (0 %)</td>
<td></td>
</tr>
<tr>
<td>Missing social situation - n (%)</td>
<td>56 (47.9 %)</td>
<td>56 (47.9 %)</td>
<td></td>
</tr>
<tr>
<td>Charlson co-morbidity index</td>
<td>0 (0-2)</td>
<td>0.5 (0-3)</td>
<td>0.25</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td>Cubicles - n (%)</td>
<td>31 (27.7 %)</td>
<td>21 (17.9 %)</td>
<td></td>
</tr>
<tr>
<td>Emergency Short</td>
<td>81 (72.3 %)</td>
<td>96 (82.1 %)</td>
<td></td>
</tr>
<tr>
<td>Stay Unit - n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekend -n (%)</td>
<td>15 (13.4 %)</td>
<td>25 (21.4 %)</td>
<td>0.11</td>
</tr>
<tr>
<td>Out of hours - n (%)</td>
<td>48 (42.9 %)</td>
<td>33 (28.2 %)</td>
<td>0.02</td>
</tr>
<tr>
<td>Australasian Triage Scale</td>
<td></td>
<td></td>
<td>0.59</td>
</tr>
<tr>
<td>1 - n (%)</td>
<td>0 (0.0 %)</td>
<td>1 (0.9 %)</td>
<td></td>
</tr>
<tr>
<td>2 - n (%)</td>
<td>13 (11.6 %)</td>
<td>18 (15.4 %)</td>
<td></td>
</tr>
<tr>
<td>3 - n (%)</td>
<td>64 (57.1 %)</td>
<td>62 (53.0 %)</td>
<td></td>
</tr>
<tr>
<td>4 - n (%)</td>
<td>34 (30.4 %)</td>
<td>36 (30.8 %)</td>
<td></td>
</tr>
<tr>
<td>5 - n (%)</td>
<td>1 (0.9 %)</td>
<td>0 (0 %)</td>
<td></td>
</tr>
<tr>
<td>Diagnostic criteria</td>
<td></td>
<td></td>
<td>0.42</td>
</tr>
<tr>
<td>Neurological</td>
<td>18 (16.2 %)</td>
<td>13 (11.4 %)</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>11 (9.9 %)</td>
<td>11 (9.9 %)</td>
<td></td>
</tr>
<tr>
<td>Chest pain: non-cardiac</td>
<td>11 (10.8 %)</td>
<td>11 (9.9 %)</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>7 (6.3 %)</td>
<td>10 (8.6 %)</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>18 (16.2 %)</td>
<td>19 (16.4 %)</td>
<td></td>
</tr>
<tr>
<td>Renal/Urology</td>
<td>4 (3.6 %)</td>
<td>7 (6.1 %)</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>5 (4.5 %)</td>
<td>6 (5.2 %)</td>
<td></td>
</tr>
<tr>
<td>Trauma</td>
<td>13 (11.6 %)</td>
<td>21 (17.9 %)</td>
<td></td>
</tr>
<tr>
<td>Missing diagnosis</td>
<td>1 (0.9 %)</td>
<td>0 (0 %)</td>
<td></td>
</tr>
<tr>
<td>Nil diagnosis</td>
<td>3 (2.7 %)</td>
<td>0 (0 %)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>21 (18.7 %)</td>
<td>25 (21.4 %)</td>
<td></td>
</tr>
</tbody>
</table>

There was a statistically significant difference (p < 0.001) between the pre-test intervention group and the post intervention group regarding the primary outcome (awareness of their discharge diagnosis). Recall of discharge diagnosis was concordant in 82 (73.2 %) patients for the pre-intervention group and 105 (89.7 %) in the post intervention group (p < 0.001). The number needed to treat was 6.1, indicating 6 patients would have to receive the intervention (alongside of standard care) for one additional patient to have accurate understanding of their discharge diagnosis from the ED.

Table 3 demonstrates the results of the secondary outcomes. The question regarding when the arrangement of the follow-up appointment is or should be, had a concordance in 34 (30.4%) participants in the pre-intervention data collection phase. The data was found to be missing on examination of the medical notes, in 39 cases there was no documented date of when the appointment was or should be arranged. In the post intervention group, the date the appointment should be attended to was documented on the discharge information card for all patients.

5. Discussion

This study found an associated observed improvement in concordance between the patient’s awareness and the documented plan in the medical notes of their discharge diagnosis and plan for follow-up with the discharge information card. This research has shown that a simple and inexpensive intervention has the potential to improve communication with patients when they are discharged home from the ED.

The results of patients’ awareness of their discharge diagnosis under current care (pre-intervention data) were similar to previous reports, where 75%–86% of patients had an awareness of their diagnosis [2–4]. The effectiveness of targeted patient education was also of similar magnitude to previously reported strategies of following a standardised procedure of information giving to provide discharge information and instructions to patients [12,13]. Failure to ensure clarity about diagnosis at the time of discharge from the ED was a theme that came from Schenhals et al [14] interviews with patients. Additionally, patients reported that being provided with discharge instructions contributed to the ease of the discharge process and requirements for follow up [14].

Simplified written discharge information along with verbal explanation were also found to increase patients’ comprehension and awareness of their discharge instructions [15–17]. Mäkinen [18] and colleagues interviewed patients the day after discharge from the ED and found that patients would like to receive more written instructions during the discharge process.

It is expected that improvements in patient awareness of their health condition and follow-up plans may reduce unnecessary return visits to the ED [19], ensure outstanding treatment plans such as review of results and ongoing medication management are addressed and importantly lead to complete management of the patient’s condition [6,19]. Not attending in a timely manner can cause deterioration of symptoms, leave outstanding care incomplete such as chasing pending results of pathology, and neglect further assessment and treatment as requested by the discharging ED clinician [3,20].

The low proportion of documentation of when the follow-up appointment should be attended in the pre intervention group was similar to those reported by Vashi and Rhodes [21] who audio taped discharge instruction encounters between patients and clinicians. They found that clinicians often recommended follow-up with a GP but only provided a specific time to patients in 39% of the discharge interviews they audiotaped. The discharge card provides patients with a written document that they can refer to that reminds them of when an appointment should be attended to.

It has been suggested that having templates for discharge documentation is effective. Yu and Green [22] recommend them because the discharging clinician cannot miss anything, as all the required information is on the template. The post intervention data saw an improvement in the proportion of documentation completed relat-
ing to when the patient was to attend their follow-up appointment, there was no missing data. For the reason that it was necessary for discharging clinicians to write when the appointment should be attended to in order to complete the discharge information card.

New technologies have attempted to remind patient when to attend their follow-up appointment with varying degrees of results in the younger population [23,24]. With the launch of the ‘My Health Record’ [25] in Australia at the end of 2018, this is a step towards potentially improving communication between health care professionals in the acute and primary care sector. However, ensuring awareness of the required primary care follow-up to patients via communication interventions is still an area that needs to be addressed.

6. Limitations

Convenience sampling was used for this study. This may be seen as a limitation as it could be argued that this technique may not have provided a representative sample for the population. However, attempts were made to avoid selection bias by recruiting patients throughout the day and night, although this resulted in more participants recruited out of hours in the pre-intervention group than in the post-intervention group. The effect of this would have been more likely to have biased the results in favour of the intervention.

For data collected on demographic and management variables, there were missing data for social situation in 54.5% of the pre intervention group and 47.9% in the post intervention group. The social situation data were collected to gather information on potentially confounding variables and to compare the characteristics of the pre and post intervention groups. Whilst approximately half the data was missing for social situation, making comparisons of the two groups inconclusive, we do not expect this missingness to have had substantial effect on the results of the secondary outcome for the research.

Given that the interview took place shortly after the patient was formally discharged from the ED, it may be argued that what was being measured was patient recall of verbal instructions rather than an effect associated with the intervention. As the process of when the interview occurred did not change between the pre and the post intervention groups then it would be expected that the results would be the same if memory recall was the main reason for the recall of instructions.

Being unblinded, there may be potential for positive bias in the post intervention data collected, because the discharging clinician gave the discharge information card to the patient knowing it was part of a research study and that their patient was likely to get interviewed to assess their awareness of the discharge plan and diagnosis. The improvements observed could therefore have been secondary to improved communication between discharging health professional and patients and patient’s recall. Repeating the study when the discharge information card becomes standard discharge practice may be of benefit to eliminate the Hawthorne effect.

The discharge information card is limited because it only addresses a small aspect of discharge information, the patient’s diagnosis and requirements for follow up appointment. It does not include information such as medication management, signs of complications and ongoing self-care. However, the focus of this paper was to assess patients’ awareness of their discharge diagnosis and follow up care arrangements. Interventions that aim to increase awareness of follow up care with a relevant health professional may improve health outcomes and subsequent use of health care resources and importantly inappropriate representations to the ED as uncovered in the literature.

Whilst the discharge information card has had an observed associated improvement in the awareness of patients’ requirements and arrangements for a follow-up appointment, it does not necessarily demonstrate compliance with attendance of the appointment.

7. Conclusions

The use of a simple discharge information card targeted towards patients was associated with greater awareness of their diagnosis and arrangement for follow-up at discharge. The discharge information card was also associated with an improved proportion of documentation regarding discharge planning. External validation of this study is recommended before implementation to ensure that the results are due solely to the intervention rather than the Hawthorne effect. Interventions to improve knowledge of diagnosis and follow-up are indicated for all patients being discharged from the ED, with further consideration of providing simplified and succinct written instructions for patients.

Author contribution

Author 1 and 3 was responsible for the study conception, and development of the intervention. Author 1 undertook the literature review, data collection, analysis and drafted manuscript with Authors 2 and 3 providing expert guidance. Author 2 assisted with literature review and concordance, and Author 3 assisted with concordance and data analysis. All Authors made final revisions to the paper and submitted.

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Provenance and conflict of interest

The authors declare that they have no conflict of interest. This paper was not commissioned.

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