

The effects of telephone consultation and triage on healthcare use and patient satisfaction: a systematic review

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ABSTRACT

Background

In recent years there has been a growth in the use of the telephone consultation for healthcare problems. This has developed, in part, as a response to increased demand for GP and accident and emergency department care.

Aim

To assess the effects of telephone consultation and triage on safety, service use, and patient satisfaction.

Design of study

We looked at randomised controlled trials, controlled studies, controlled before/after studies, and interrupted time series of telephone consultation or triage in a general healthcare setting.

Setting

All healthcare settings were included but the majority of studies were in primary care.

Method

We searched the Cochrane Central Register of Controlled Trials, EPOC specialised register, PubMed, EMBASE, CINAHL, SIGLE, and the National Research Register and checked reference lists of identified studies and review articles. Two reviewers independently screened studies for inclusion, extracted data, and assessed study quality.

Results

Nine studies met our inclusion criteria: five randomised controlled trials; one controlled trial; and three interrupted time series. Six studies compared telephone consultation with normal care; four by a doctor, one by a nurse, and one by a clinic clerk. Three of five studies found a significant decrease in visits to GPs but two found an increase in return consultations. In general at least 50% (range = 25.5–72.2%) of calls were handled by telephone consultation alone. Of seven studies reporting accident and emergency department visits, six showed no difference between the groups and one — of nurse telephone consultation — found an increase. Two studies reported deaths and found no difference between nurse telephone consultation and normal care.

Conclusions

Although telephone consultation appears to have the potential to reduce GP workload, questions remain about its effect on service use. Further rigorous evaluation is needed with emphasis on service use, safety, cost, and patient satisfaction.

Keywords

consultation; hotlines; review, systematic; telephone; triage.

INTRODUCTION

In recent years there has been an increase in the use of telephone consultation and triage (the process where calls from people with a healthcare problem are received, assessed, and managed by giving advice or by referral to a more appropriate service).¹ One impetus for the development of telephone consultation has been to reduce the workload of GPs and accident and emergency (A&E) departments. A&E attendances in the UK have increased,² as has demand for the service of GPs, although it has been estimated that more than half of out-of-hours calls can be handled by telephone advice alone.^{3–5}

Although some telephone consultation is done by doctors,³ much is now done by qualified nurses using computer-based clinical decision support systems. This reflects changes in the role of the nurse in recent years and the move towards nurses undertaking some tasks previously carried out by doctors. One of the largest telephone consultation systems in operation is NHS Direct; this is a 24-hour nurse-led telephone advice system, based in England, that aims to help callers self-manage problems and reduce unnecessary demands on other NHS services.^{6,7}

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To date relatively little information exists on whether telephone consultation reduces pressure on other services. In Denmark, demand for home visits fell by 28% after the introduction of telephone consultation by doctors.³ In the UK there was a small decrease in the use of GP cooperatives, although no significant decrease in the use of A&E departments or ambulance services after the introduction of NHS Direct.⁸

Caller satisfaction with NHS Direct has been found to be high.^{9,10} However, it has been argued that older people, minority ethnic groups, and other disadvantaged groups underuse the service, and that it may in fact have increased, not decreased, the workload of other healthcare services.¹¹ Concerns about telephone consultation include the quality and safety of advice given,^{12–17} although other research has found it safe and effective.^{18–20} In an attempt to clarify the situation we conducted a systematic review of telephone consultation and triage services to assess their effect on safety, satisfaction, and service usage.

METHOD

Inclusion criteria

We included randomised controlled trials, controlled trials, controlled before/after studies and interrupted time series of telephone consultation or triage. This included telephone consultation, by any healthcare worker, compared with a face-to-face consultation or normal care (not including telephone consultation), or telephone consultation by one type of healthcare worker versus another (for example, nurse-led versus doctor-led telephone consultation). Disease-specific phone lines were excluded. The outcomes of interest were: mortality; adverse events; service use; calls handled by telephone alone; patient satisfaction; and cost.

How this fits in

In recent years there has been a growth in the use of telephone consultation for the management of healthcare problems. Previous research suggests that more than half of calls can be handled by telephone advice alone, but there have been doubts about safety, and the quality of advice given. In this review we found that telephone consultation can reduce GP visits and that, in general, 50% of calls can be handled by telephone. There was no apparent increase in adverse effects or use of other services and patients were satisfied. However, there was limited data on patient satisfaction and adverse effects.

Box 1. Search terms and strategy.

- ▶ 1. Triage (MeSH) all fields
- ▶ 2. Helpline* (free text)
- ▶ 3. Hotlines (MeSH) all fields
- ▶ 4. Family practice/organisation and administration (MeSH)
- ▶ 5. Emergency medicine/organisation and administration (MeSH)
- ▶ 6. #1 OR #2 OR #3 OR #4 OR #5
- ▶ 7. Telephone* (free text)
- ▶ 8. #6 AND #7
- ▶ 9. Telephone consultation
- ▶ 10. Telephone triage
- ▶ 11. NHS direct
- ▶ #8 OR #9 OR #10 OR #11

Identification of studies

We searched for published and unpublished studies using the following databases: Cochrane Central Register of Controlled Trials (Cochrane Library Issue 1 2003), specialised register of the Cochrane Effective Practice and Organisation of Care Group (EPOC) (March 2003), PubMed (1966–February 2003), EMBASE (February 2003), CINAHL (1983–February 2003), SIGLE (System for Information on Grey Literature) (1980–February 2003), and the National Research Register (Issue 2 2003). For details of the search terms used see Box 1. We checked reference lists of identified studies and review articles and contacted experts in the field. There were no language restrictions.

Data extraction and analysis

Two reviewers independently screened titles and abstracts of citations identified by the electronic search, applied the selection criteria to potentially relevant papers, and extracted data from included studies using a standardised checklist. We extracted information on participants, outcomes, and the intervention, which included the comparison, setting, service provider, use of algorithms or computer-based clinical decision support systems, and hours covered. We assessed methodological quality using the criteria of the Cochrane EPOC Group.²¹

Due to heterogeneity in study design, interventions, outcomes, and participating health professionals we did not pool studies in a meta-analysis. Instead a narrative and tabular summary of findings is presented and where possible we have reported post-intervention differences and 95%

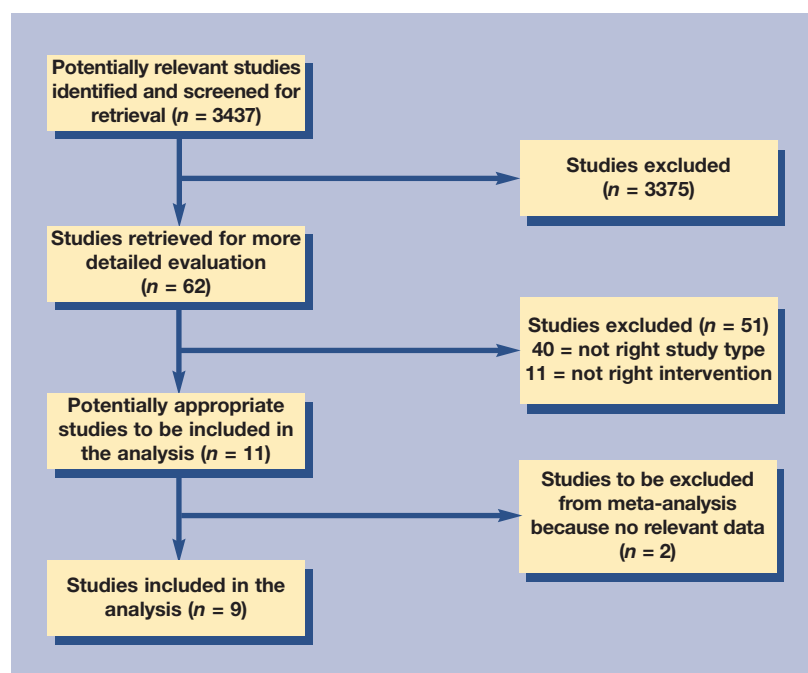


Figure 1. Flow chart showing how studies were identified.

confidence intervals (CIs) or *P*-values. For interrupted time series, where possible, we have calculated a change in the level of outcome at the first point after the introduction of the intervention, and estimated a change in the slopes of the regression line (calculated as post-intervention minus pre-intervention slope).

RESULTS

We identified 11 studies that met the inclusion criteria (Figure 1). However, two^{22,23} did not present relevant data and were excluded, leaving nine studies. Five were randomised controlled trials,^{19,24–27} one a controlled trial,²⁸ and three were interrupted time series,^{29–31} one of which³¹ was a population-based study. Two of the randomised controlled trials^{19,27} were parallel trials using the same methodology; six were set in general practice,^{19,25,27,29–31} all except one of them³¹ in the UK. Four studies concerned out-of-hours care.^{19,24,27,31} In all studies, where a nurse delivered telephone consultation, algorithms or protocols were used. More information about individual studies can be found in Supplementary Table 1.

In the controlled studies, allocation concealment was adequate in three,^{19,25,27} inadequate in one,²⁸ and unclear in two.^{24,26} Four studies reported adequate follow up of patients^{19,25–27} and all five randomised controlled trials and the one controlled study had blinded assessment of the primary outcome. In all three interrupted time series the intervention was independent of other changes; they had blinded assessment of the primary

outcome and complete data sets. In two of the interrupted time series the data were analysed appropriately. However, in the third³¹ the researchers did not look for serial correlation and the analysis was redone using time series regression techniques. In one³¹ a change from manual to electronic recording after the start of the intervention may have led to detection bias.

When interpreting the data, it should be noted that for many of the outcomes equivalence was regarded as desirable. Researchers were normally concerned about determining whether telephone consultation or triage was as safe and effective as existing services. Numerical data from individual studies are presented in Supplementary Tables 2 and 3.

Telephone consultation versus normal care

Six studies compared telephone consultation with standard management that did not include telephone consultation (Supplementary Table 2). In four of these the telephone consultation was by a doctor,^{24,25,29,31} in one a nurse³⁰ and in one a clinic clerk.²⁶

Routine GP appointments. Of three routine GP appointments, one²⁹ found a significant reduction of 39% in GP visits ($P < 0.001$). However, one telephone consultation by a doctor²⁵ found that although same-day appointments had decreased, there was an increase of visits in the 2-week follow-up period (mean difference 0.2 [95% CI = 0.0 to 0.3]). The other telephone consultation (by a nurse)³⁰ also found that although there was a significant reduction in immediate visits (range difference [RD] -0.23 [95% CI = -0.26 to -0.20]) there was an increase in return consultations (RD = 0.32 [95% CI = 0.22 to 0.41]).

Calls handled by telephone advice alone. Calls handled by telephone advice alone ranged from 25.5% in the study of telephone consultation by nurses³⁰ to 52%²⁹ and 72%²⁵ by doctors.

Visits to A&E. With regard to visits to A&E, in the three studies of telephone consultation by a doctor, two^{24,25} found no significant difference between telephone consultation and face-to-face appointments (RD = -0.04 to 0). The other study³¹ found a significant increase in contacts with A&E but, given the constant rise in contact rates, the authors performed a regression model that showed the increase was not statistically significant. The study of nurse telephone consultation³⁰ found a significant rise in the number of visits to A&E (mean difference = 0.023 [95% CI = 0.015 to 0.032]).

Hospital admissions. When hospital admissions ($n = 2$) were compared, the trial of telephone consultation by doctors²⁴ found no significant difference between the intervention and control groups (adjusted risk difference at 2-year follow up = 0.03). However, the trial using clinic clerks to run a specialised telephone service²⁶ found a significant reduction in hospitalisations at 12 months (mean difference = 0.17; $P < 0.05$).

Home visits by GPs. One study reported the number of home visits by a GP³⁰ and found a non-significant reduction in the number of visits (RD = -0.02 [95% CI = -0.04 to 0.00]).

Out-of-hours contacts. One trial of telephone consultation by a doctor²⁵ found no difference in out-of-hours contacts between the two groups (mean difference = 0). However, the other, an interrupted time series of nurse telephone consultation,³⁰ found a significant increase in the number of out-of-hours contacts in the intervention group (mean difference = 0.04 [95% CI = 0.01 to 0.07]).

Patient satisfaction. Two randomised controlled trials compared satisfaction in intervention and control groups. One²⁵ found no significant difference in satisfaction between telephone and face-to-face consultations (difference = -8.4% [95% CI = -23.1 to 6.4%]) and the other²⁶ found that patients in the intervention group were more satisfied ($P < 0.05$). Satisfaction was high in the two other studies. In one of these²⁴ 78% of those interviewed were satisfied with length of time before the doctor responded, length of consultation, and care provided; in the other,²⁹ 98% were satisfied or very satisfied with the outcome of the telephone consultation and 84% happy to receive the service again in the future. However, the data regarding satisfaction needs to be interpreted cautiously. In one study²⁵ there was a response rate of less than 50%, and in two^{24,29} there was no comparison group — one because it was an interrupted time series²⁹ and the other because the researchers only collected data on a subset of intervention patients.

Cost. The study³⁰ that carried out an economic evaluation found little difference in cost between the intervention and control groups (mean difference = 1.48 [95% CI = -0.19 to 3.15]). In the other,²⁹ the researchers looked at cost of phone calls only, and found that telephone bills increased by 26%.

Telephone consultations compared by type of healthcare worker

Three studies compared telephone consultation by

one type of healthcare worker with another (Supplementary Table 3). Two randomised controlled trials compared nurse telephone consultation with telephone consultation by a doctor in an out-of-hours deputising service^{17,25} and one controlled trial compared telephone consultation by a health assistant with telephone advice from a doctor or a nurse.²⁶

Routine GP appointments. Two trials^{19,27} reported less GP appointments in surgery in the intervention group during the trial period. However, this was only significant in one¹⁹ (relative risk = 0.62 [95% CI = 0.58 to 0.66]).

Calls handled by telephone advice alone. In one study,¹⁹ both doctors and nurses handled 50% of calls by telephone advice alone. In the other,²⁷ 59% of calls in the nurse consultation group and 62% of calls in the GP group were managed by telephone advice alone.

Visits to A&E. All three studies found a slight increase in number of visits to A&E in the intervention group (range = 0.3–2% increase), but results were not significant.

Hospital admissions. Two studies^{19,27} found no significant difference between the intervention and control groups regarding the number of hospital admissions at 24 hours and 3 days after contact with out-of-hours services (RD at 3 days = -0.01 [95% CI = -0.02 to 0.00] and -0.02 [95% CI = -0.08 to 0.05]).

Out-of-hours contacts. Two studies²⁷ found a significant reduction in the number of home visits by the deputising service (RD = -0.06 [95% CI = -0.07 to -0.04] and -0.12 [95% CI = -0.24 to -0.11]).

Cost. In the trial with an economic evaluation,¹⁹ the cost of providing nurse telephone consultation was £81 237 a year. However, there was a reduction in overall costs of over £100 000.

Death. Neither randomised controlled trial^{19,27} found a significant difference in deaths between nurse telephone triage and triage by a doctor for patients who had been in contact with the out-of-hours service within the previous 7 days (RD = 0 [95% CI = 0.00 to 0.00] and RD = 0 [95% CI = -0.03 to 0.04]). However, one²⁷ was underpowered to detect mortality.

DISCUSSION

Summary of main findings

This systematic review found that telephone consultation and triage reduce immediate GP or

home visits and that, in general, at least 50% of calls can be handled by telephone advice alone. However, it is unclear if, in some instances, triage is just delaying visits as two studies^{25,30} showed an increase in return consultations. We found no evidence of an increase in adverse effects or use of other services and patients were satisfied. However, data on some important outcomes, in particular patient satisfaction, cost, and adverse events, were reported by few of the included studies. Initially, we felt there might be a distinction between telephone consultation and triage systems; in reality, we found that these terms were used interchangeably. The majority of studies in this review (five out of nine) were set in UK general practice.

One of the aims of this review was to compare telephone consultation by different groups of healthcare professionals. Only three of the included studies directly compared one group of healthcare worker with another.^{19,27,28} The two studies comparing nurse telephone consultation with a GP deputising service^{19,27} were good quality randomised controlled trials and found nurses could reduce GP workload without an increase in adverse events. Two of the older studies^{26,28} used unqualified staff to deliver telephone consultation and are, therefore, perhaps less relevant to present-day systems where the emphasis seems to be on consultation by qualified staff. In the other included studies the type of healthcare professional delivering the intervention did not appear to affect outcome, although one study — of nurse telephone consultation — found a small but significant increase in out-of-hours contacts and visits to A&E.³⁰ Although other uncontrolled studies have found high levels of satisfaction with nurse telephone consultation,^{11,12} we have no way of assessing this important outcome as none of the studies of nurse telephone consultation in this review reported it adequately.

Comparison with existing literature

This review supports previous estimates that at least 50% of calls can be handled by telephone advice alone.⁵⁻⁷ In addition, findings from an observational study of the impact of NHS Direct,⁸ showing that there was no decrease in the use of A&E departments but an impact on the use of GP cooperatives, are similar to the results of this review. Previous studies have highlighted the potential for errors or mismanagement with telephone consultation;¹⁵⁻¹⁶ however, few studies in this review reported adverse outcomes. The two that did^{19,27} found no increase in adverse events, although one²⁷ was underpowered to detect mortality.

Strengths and limitations of the study

We used systematic and rigorous methods to synthesise the current evidence on telephone consultation and highlight areas for further research.

However, there are a number of methodological issues that could have an important bearing on the validity of these results. Publication and other selection biases are a potential threat to validity in all systematic reviews, but this is a particular problem when searching for non-randomised studies. Non-randomised studies are more difficult to identify than those that are randomised because there is a variety of study designs, no standardised terminology, and they may not be keyworded according to study design.³² Despite our efforts to identify all eligible studies, published and unpublished, we cannot exclude the possibility that some studies were missed. In addition, no studies met all of the methodological criteria on the EPOC checklist (which may adversely affect the validity of the results) and the diversity of study types, interventions, and outcomes measured makes meaningful comparison between studies problematic.

Another limitation of this review concerns the identification of the most appropriate outcome measures. We chose service use as one of our major outcomes, as did the majority of studies included in the review. However, it could be argued that reducing service use should not be the aim of telephone consultation. Preventing patients from consulting GPs for minor illnesses is not necessarily desirable and may also discourage those with severe or treatable problems from attending — on the other hand, telephone consultation may have the potential to increase access for those who are unable or reluctant to present in person. In addition, although 50% of calls may be dealt with by telephone advice alone this does not necessarily equate to a 50% drop in workload. Indeed, a new service such as telephone consultation may attract patients who would previously have dealt with their problem without recourse to a healthcare professional. This may be a particular issue with a telephone advice and information service such as NHS Direct. Patient satisfaction and safety may, therefore, be the most important outcomes. However, there was a lack of data on both these outcomes and over half the studies in the review were randomised controlled trials, which are generally too small to detect rare adverse events.³³

Implications for clinical practice and future research

The increase in the use of telephone consultation is,

at least partially, a response to increased workloads for GPs and attempts to manage requests for same-day appointments. In addition the current government agenda is promoting the use of alternative technologies to improve access to health care. The largest telephone consultation service within the UK is now NHS Direct, which is presently staffed by qualified nurses. However, we found no controlled studies of this service that met our inclusion criteria. Therefore, although telephone consultation appears to have the potential to reduce GP workload, further rigorous evaluation is needed with emphasis on service use, safety, cost and patient satisfaction.

Supplementary information

Additional information is available online at <http://www.rcgp.org.uk/journal/supp/index.asp>

Competing interests

None

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