



An randomized controlled trial of Post-it® notes did not increase postal response rates in older depressed participants

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Abstract

Rationale, aims and objectives Our aim was to evaluate the effectiveness of a Post-it® note to increase response rates and shorten response times to a 4-month postal follow-up questionnaire sent to participants taking part in the Collaborative Care in Screen-Positive Elders (CASPER) trials.

Method Our trial was a two-arm randomized controlled trial comparing response rates to questionnaires with a printed Post-it® note (intervention) and without (control), nested in multi centred randomized controlled trials of older people with varying levels of depressive symptoms; the CASPER⁺ and CASPER Self Help for those At Risk of Depression (SHARD) trials. A total of 611 participants were eligible and randomized. The primary outcome was response rates, secondary outcomes were time to response and need for a reminder.

Results Of 297 participants, 266 (89.6%) returned their 4-month questionnaire in the post-it note arm, compared with 282 of 314 participants (89.8%) in the control arm (OR = 0.97, 95% CI: 0.57, 1.65, $P = 0.913$). There were no statistically significant differences in time to respond or the need to be sent a reminder. Patients with a major depressive episode were more likely to return questionnaires with post-it notes (P of interaction = .019).

Conclusion There was no significant difference in response rates, time to response, or the need for a reminder between the intervention and control at 4-month follow up for older people with depressive symptoms. However, there was a significant interaction between the Post-it® note group and level of depression.

Introduction

Postal questionnaires are commonly used in research to elicit self-reported outcome data from study participants and represent an efficient and cost-effective method of data collection [1], which is widely utilized in health services research [2]. However, a major limitation of this data collection method is poor participant response rates, which can introduce non-response bias and reduce the statistical power of the study. [3] One of the main factors adversely affecting response rates is greater age. Studies in older populations have shown questionnaire response rates of 60% or less [4,5], whereas response rates of 70% and above are generally deemed necessary to ensure the sample is sufficiently representative of the target population [6]. Therefore, evaluating methods that can be implemented to improve response rates, particularly in studies of older people, is highly relevant to health services research.

Why look at Post-it® notes to increase questionnaire response rates? Garner [7] postulates that researchers wishing to increase

response rates may look to the area of consumer research, seeking to use cognitive economizing by finding ways to activate a social norm that stimulates compliance. He suggests the use of Post-it® notes may be useful because of their potential attention-gaining effects on both the material and the request. Once attention is gained, participants may be more inclined to engage with the material.

A Cochrane systematic review [2] evaluated 110 different strategies to improve response rates to postal questionnaires and identified studies that found the appearance of the questionnaire can affect response rates. For example, the odds of response were increased by a quarter when hand-written labelled questionnaires were used (OR 1.25; 95% CI 1.08–1.45).

Whilst this Cochrane review [2] identified several studies evaluating the appearance of questionnaires, such as using a more personalized approach, colour of paper and handwritten signatures on cover letters, there are to our knowledge, only four studies which evaluated the effectiveness of attaching a Post-it®

note to increase response rates to postal questionnaires [7]. However, there were limitations to these studies, Garner [7] reported statistically significant increases ($P < 0.05$) in response rates when Post-it® notes were used; however, they were undertaken within an academic setting rather than in the context of response rates associated with questionnaires in health services research.

Gendall and Healey [8] reported a series of experiments involving non-monetary incentives conducted between 1998 and 2006 on seven mail surveys fielded by the Department of Marketing at Massey University using unconditional incentives, donations to charity or Post-it® notes. Three of these surveys sought to replicate Garner's results. A Post-it® note with the handwritten message 'Please take a few minutes to complete this for us, thank you', was attached to a covering letter that accompanied the survey questionnaire, but failed to replicate Garner's results. Post-it® notes had no effect in two national surveys, but there was a 3.5% increase in response in a smaller scale local survey, although this was not statistically significant.

A more recent study reported by Tilbrook *et al.* [9], randomized 499 participants in an acupuncture for neck pain study (ATLAS trial) to either Post-it® notes or usual care. They found that yellow post-it notes did not enhance questionnaire return rates for participants in this patient group (odds ratio 0.97, 95% CI 0.60–1.57).

A further Cochrane review [10] looked at 38 studies evaluating different methods of increasing retention rates in randomized controlled trials. They reported that monetary incentives and offers of monetary incentives increase postal and electronic questionnaire retention but that some retention strategies needed further evaluation.

Given the problems identified concerning attrition in randomized controlled trials, particularly in older people, along with the limited research into non-academic populations, we believe there is a case for evaluating the effectiveness of Post-it® notes as a means of improving response rates in both health service settings and in older populations.

The aim of this study was to evaluate the effectiveness of a Post-it® note as a means of increasing response rates to a 4-month postal follow-up questionnaire in a health care related study with older people suffering from depression. Our secondary aim was to assess whether the use of a Post-it® note shortened questionnaire response times.

Method

Study design

The CASPER Post-it® note (PiN) trial was a two-arm randomized controlled trial comparing response rates to questionnaires with a printed Post-it® note (intervention) and questionnaires without such a note (control). The study was a 'trial within a trial' and was embedded within two mental health trials among older people. Participants were recruited from the CASPER⁺ and CASPER SHARD trials, which are large scale multi-centred randomized controlled trials. Recruitment commenced in September 2012 with the first patients reaching 4 months follow-up in January 2013.

The CASPER⁺ and CASPER SHARD study

The CASPER⁺ study is an National Institute for Health Research Health Technology Assessment funded multi-centred randomized controlled trial looking at the effectiveness and cost effectiveness of a form of collaborative care with behavioural activation in patients identified with above-threshold depressive symptoms in people aged 65 and over. The CASPER SHARD trial is a multi-centred randomized controlled trial looking at the effectiveness of a guided self-help booklet with behavioural activation in patients identified with sub-threshold depressive symptoms in people aged 65 and over. Both CASPER⁺ and CASPER SHARD recruited patients 65 years and over from GP practices in several recruiting sites in the North East of England, including: York and the surrounding area; Harrogate; Hull; Leeds and the surrounding area; Durham; Newcastle; and Northumberland. Recruitment for CASPER⁺ commenced in September 2012 with the first patients reaching 4 months follow-up in January 2013. For CASPER SHARD recruitment began in April 2014. Both CASPER⁺ and CASPER SHARD completed recruitment in August 2014. CASPER SHARD's 12 month follow-up will finish in August 2015 whilst CASPER⁺'s 18 month follow-up is due to finish in January 2016.

CASPER Post-it® note (PiN) trial participants

All 611 participants who were due to be sent a 4-month follow-up questionnaire for the CASPER⁺ and CASPER SHARD trials during the CASPER PiN sub-study randomisation phase between 29/01/2014 and 11/08/2014 were eligible. Patients who reached 4 months follow-up before commencement of CASPER PiN recruitment, as well as patients who asked to be withdrawn from the CASPER trials or did not want to receive a questionnaire at this time point were excluded.

Procedure

At 4-month follow-up, participants were sent a questionnaire pack consisting of a cover letter and questionnaire. Participant allocation was carried out by computerised simple randomisation using an SQL function through the trial management database by the York Trials Unit, thereby preventing the possibility of subversion. The personnel who added the post-it notes to questionnaires were different to those who had patient contact to ensure allocation concealment. Participants were randomized to either the intervention group or usual practice. For participants in the intervention group, a printed Yellow Post-it® note, 3 in. square was attached to the top half of the front page of the questionnaire, containing the following printed message:

Please take a few minutes to complete this for us. Thank you.
[Signed with the first name of researcher contact]

Participants who were assigned to the usual practice group were sent the questionnaires as usual without a Post-it® note. Questionnaires were returned to the York Trials Unit where they were date stamped on the front page of the questionnaire and logged onto the CASPER⁺ management database. Participants who did not return their follow-up questionnaire after 4 weeks were followed up with

the standard CASPER⁺ reminder procedure (a reminder letter and questionnaire pack were sent after 4 weeks, if no response, a follow-up phone call was given after a further 4 weeks).

Outcomes

Primary outcome

The primary outcome was the questionnaire response rate, defined as the proportion of participants who returned their 4-month postal follow-up questionnaire or reminder questionnaire to the York Trials Unit.

Secondary outcomes

- Time to response. This was defined as the number of days which elapsed between the questionnaire being mailed out to participants and the questionnaire being recorded as returned to York Trials Unit.
- The proportion of participants requiring a reminder at 21 days.

Statistical considerations

Randomisation

Participants reaching 4 months follow-up were randomized on a 1:1 ratio to either receive questionnaires with or without a Post-it® note.

Sample size

As is usual for embedded trials the power of the study was driven by the numbers of the host trials' participants. Consequently, the sample size for this embedded study was limited by the number of CASPER participants reaching 4-month follow-up during the CASPER PiN recruitment time frame. An original power calculation was conducted based on the number of CASPER⁺ participants who were anticipated to reach 4-month follow-up after the 1st of November 2013 given known dropout rates. A total available sample size of 328 patients was anticipated (164 in each arm). Assuming a control response rate of 85% (which was based on response rate earlier in the trial), a response rate difference of 10% could be detected with a minimum of 80% power and two-sided significance at the 5% level. The subsequent inclusion of CASPER SHARD participants in the CASPER PiN study resulted in a total of 611 participants being randomized, corresponding to more than 90% power to detect a response rate difference of 10%.

Analysis

All analyses were conducted on intention to treat basis, including all participants in the groups to which they were randomized. Analysis was conducted in STATA VERSION 13.1 (College Station, Texas) using 2-sided significance tests at the 5% level.

For the primary analysis, a logistic regression model was applied predicting questionnaire return at 4 months (yes or no) from sub-study group (post-it note or no post-it note) while adjusting for main trial treatment arm (collaborative care, self-help booklet or usual care), baseline depression (subthreshold depression or major

depressive episode), age and gender. Odds ratios and 95% confidence intervals for the return rate were obtained for the effect of Post-it® note, and statistical significance was ascertained. In order to explore whether the Post-it® note intervention could have differential effects in different patient groups, interaction terms between the post-it note grouping and age, gender, main trial treatment arm and baseline depression were added to the earlier model in separate regressions.

Time to return of the 4-month follow-up questionnaire was calculated as the number of days from the date the follow-up questionnaire was sent out to the date the follow-up questionnaire was returned to the York Trials Unit. Median time to return was calculated for all participants who returned their questionnaire. For further analysis, questionnaires that were returned after 56 days (8 weeks) and questionnaires that were not returned were treated as censored at 56 days. A Cox's proportional hazards model for time-to-return was used to compare the two groups. Time-to-return was predicted by sub-study group (Post-it® note or no Post-it® note) while adjusting for main trial treatment arm (collaborative care, self-help booklet or usual care), baseline depression (subthreshold depression or major depressive episode), age and gender. Statistical significance of the hazard ratio for post-it note grouping was ascertained.

The proportion of participants who needed to be sent a reminder questionnaire after 3 weeks of no questionnaire return was compared between Post-it® note arms by logistic regression using the same predictors as the primary analysis.

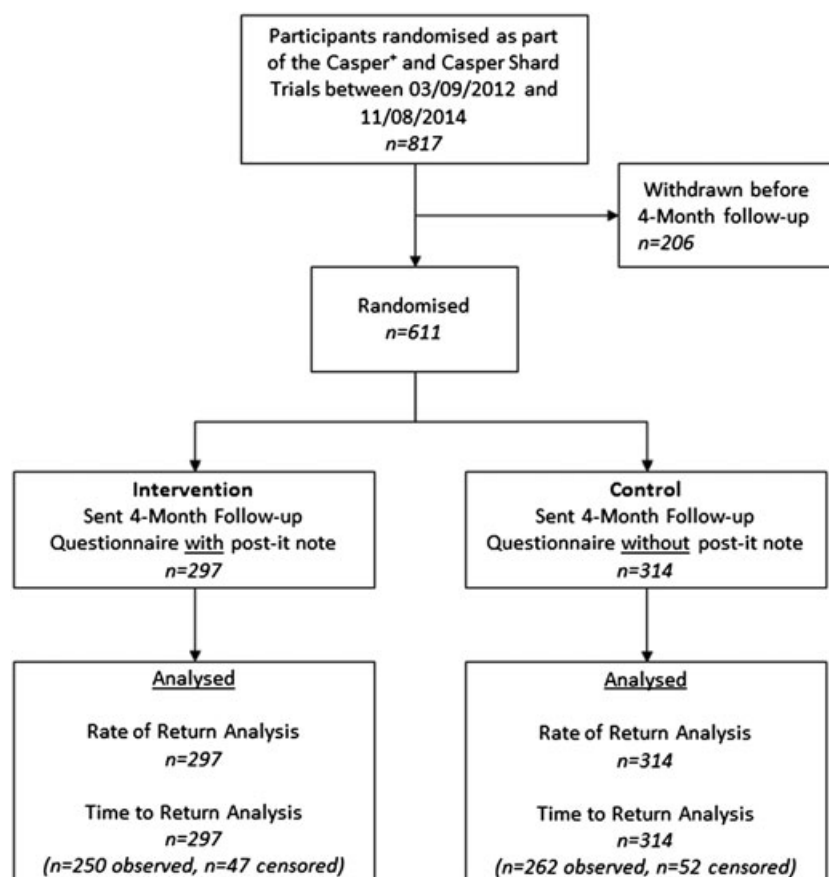
Ethical approval

REC approval was received to conduct the CASPER study (REC ref: 10/H1302/61). The CASPER PiN sub-trial was given ethics approval as a substantial amendment to the original CASPER trial by the NRES Committee Yorkshire & The Humber – Leeds East. Within this nested trial, participants did not have the opportunity to give informed consent to enter into the sub-study. However, we do not consider this to be a major ethical issue, because these participants have already consented to take part in the CASPER⁺ trial and to receive follow-up CASPER⁺ questionnaires. Participants were made aware that if they wish, they may withdraw from the study.

Results

Participants

A total of 817 participants enrolled in the CASPER⁺ and CASPER SHARD studies, (485 CASPER⁺; 332 CASPER SHARD). A total of 611 (75%) of these participants reached the 4-month follow-up point during the randomisation phase of the PiN sub-study and were randomized to receive their follow-up questionnaire with or without a Post-it® note attached (Fig. 1). Baseline Characteristics of age, gender and source trial allocation were balanced between the intervention (Post-it® note) and control (no Post-it® note) groups (Table 1). The study population was made up approximately equally of CASPER⁺ participants (individuals with a major depressive episode) and CASPER SHARD participants (individuals with sub-threshold depression). A chance imbalance was

**Figure 1** Flow of participants through the trial**Table 1** Baseline characteristics

	Post-it note n = 297	Control n = 314
Age (years)		
Mean (SD)	74.3 (6.83)	73.8 (6.27)
Median (Min–Max)	73 (66–99)	72 (66–92)
Gender, n(%)		
Male	121 (40.7)	126 (40.1)
Female	176 (59.3)	188 (59.9)
Main trial treatment allocation, n(%)		
Collaborative care	69 (23.2)	80 (25.5)
Self-help booklet	80 (26.9)	77 (24.5)
Usual care	148 (49.8)	157 (50.0)
Level of depression, n(%)		
Major depressive episode ¹	134 (45.1)	167 (53.2)
Subthreshold depression ²	163 (54.9)	147 (46.8)

¹CASPER* Trial.²CASPER SHARD Trial.

SD, standard deviation.

observed in the randomly assigned post-it note grouping between these two populations, with a smaller percentage of patients in the Post-it® note group having a major depressive episode compared with the control group.

In the post-it note arm, 266 of 297 participants (89.6%) returned their 4-month questionnaire compared with 282 of 314 participants (89.8%) in the control arm. Adjusting for age, gender, main trial treatment allocation and baseline depression, logistic regression revealed no statistically significant effect of having received a Post-it® note (OR for odds of return = 0.97; 95% CI: 0.57, 1.65; $p = .913$; Table 2). Exploratory sub-group analyses showed no differential effects of the post-it note intervention for age ($P = 0.361$), gender ($P = 0.325$) or main trial treatment allocation ($P = 0.482$). However, a significant interaction between the Post-it® note group and baseline depression ($P = 0.019$) suggested that participants with a major depressive episode were more likely (OR = 1.73), and participants with sub-threshold depression were less likely (OR = 0.44) to return questionnaires to which Post-it® notes were attached compared with control group participants; however, this was not pre-specified.

Time to respond

Days to return ranged from 2 to 129 days. For participants who responded, the median days to respond were 14 days in the Post-it® note group and 14 days in the control group. Time-to-event analysis included questionnaires that were returned within 8 weeks (56 days) of being sent ($n = 250$ in the post-it note group and $n = 262$ in the control group), treating the remaining questionnaires that had either not been returned or returned after 56 days as

Table 2 The Effect of post-it note allocation on trial outcomes

Outcome	Statistic (odds/hazard ratio)		Standard error	95% Confidence interval	P-value
Questionnaire return (Y/N) ¹	OR	0.97	0.262	0.57, 1.65	.913
Time to return (days) ²	HR	1.05	0.093	0.88, 1.25	.611
Need for a reminder (Y/N) ³	OR	0.97	0.172	0.69, 1.38	.875

¹Logistic regression.²Cox regression.³Logistic regression. All models predicting outcome from post-it note grouping (post-it note or control), adjusting for: age, gender, main trial treatment allocation (Collaborative care, self-help booklet or usual care) and baseline depression (Major depressive episode or subthreshold depression).

HR, hazard ratio; OR, odds ratio.

censored ($n=47$ in the Post-it® note group and $n=52$ days in the control group). Time to return for the two study groups is illustrated in Fig. 2. A Cox regression adjusting for the same variables as the primary analysis revealed no statistically significant effect of having received Post-it® note (HR = 1.05; 95% CI: 0.88, 1.25; $P=0.611$, Table 2) on time to respond.

Need for reminder

Fewer participants in the Post-it® note arm (89 of 297, 30.0%) required a reminder following 3 weeks of questionnaire non-return than in the control arm (97 of 314, 30.9%). Adjusting for age, gender, main trial treatment allocation and baseline depression, logistic regression revealed no statistically significant effect of having received a Post-it® note (OR for odds of return = 0.97; 95% CI: 0.69, 1.38; $P=0.875$; Table 2).

Discussion

The evidence for an improvement in response rates in questionnaire studies has to date had mixed results, with response rates in students showing a significant improvement [7] and a study in a health care setting showing no improvement [9]. Our trial, a 'trial within trials' found no significant difference in response rates between the use of a Post-it® note or control for the 4 month follow-up questionnaires for older aged people with depressive symptoms. The odds ratio of 0.97 was identical that found by Tilbrook and colleagues among a

younger age group of patients (mean age = 53 years). This further supports the findings of no effect of this intervention to reduce attrition in trials. Furthermore, there was no significant difference between the groups in their time to response or for the need to send a reminder questionnaire. However, we did find a significant interaction between the Post-it® note group and level of depression. This suggested that participants with a major depressive episode (moderate to severe symptoms) were more likely than participants with sub-threshold depression (mild symptoms) to return questionnaires to which Post-it® notes were attached compared with control group participants. Further study of Post-it® notes in a severe mental illness population may prove worthwhile. However, this interaction test was not pre-specified and could have occurred by chance. To confirm this finding would require a replication trial to be conducted among patients with severe depressive illness.

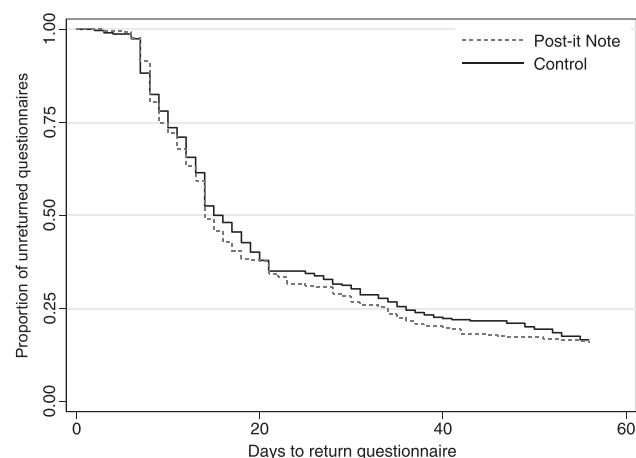
This 'trial within a trial' was a large study of 611 participants. The overall response rates for the 4 month follow-up in the CASPER trials were high, 83% for CASPER⁺ and 90% for CASPER SHARD, which was higher than seen in previous studies with older people [3–5]. This may have been due to the population having depressive symptoms, which might have overridden the effects of age on response rates in this instance. This, coupled with existing strategies within these trials to increase response rates, such as sending a postal reminder at 21 days and a telephone follow-up for non-responders to the reminders, may have resulted in little room to see a high levels of improvement in response rates.

The findings of this 'trial within trials' study supports the evidence from Tilbrook *et al.* [9] who also found no significant effects of improvement in response rates using a Post-it® note intervention in a healthcare research setting.

In summary, a yellow Post-it® note did not enhance overall response rates, time to response, or the need for a reminder questionnaire, in 4-month follow-up questionnaires in a large trial of older people with varying levels of depressive symptoms in a healthcare context. A further study of Post-it® notes in a severe mental illness population may prove worthwhile; however, other measures to increase response rates in postal questionnaires for older adults should also be explored.

Acknowledgements

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**Figure 2** Kaplan–Meier survival curve of time to return in days

Conflict of interest

There were no conflicts of interest disclosed.

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