# How to increase participation and completion rates in questionnaire surveys of primary care patients? A randomized study

Paul Sebo, Benoit Tudrej, Augustin Bernard, Bruno Delaunay, Alexandra Dupuy, Claire Malavergne, Hubert Maisonneuve

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## *Abstract*

**Background:** Participation and completion rates are often low in questionnaire-based surveys where participants are recruited by post, e-mail, or telephone.

**Objective:** We aimed to compute participation and completion rates for paper or mixed-mode questionnaires, with patients recruited in primary care physicians' waiting rooms by research assistants who were available to answer their questions if necessary.

**Methods:** In this randomized study conducted in 2023 in France, five research assistants recruited 974 consecutive patients from 39 practices. Participants were randomized into four groups using simple randomization: 'paper with incentive' (n=251), 'paper without incentive' (n=368), 'mixed mode with tablet' (n=187), and 'mixed mode with QR code' (n=168). We computed the participation and completion rates and the median number of questions answered. We used univariable/multivariable logistic and negative binomial regressions to compare the four groups.

**Results:** 822 patients (women=65.3%, median age=52) agreed to participate (participation rate=84.4%). Participation rates were not statistically different between the groups (p-value=0.23). Overall, 806 patients (98.1%) answered all 48 questions. The differences between the groups were small but statistically significant in univariable and multivariable analyses (median number of questions answered=48 for all groups; completion rate=99.8% for paper, 96.8% for paper/tablet, and 93.3% for paper/QR code, p-values=0.01).

**Conclusions:** Recruiting patients in waiting rooms with the help of research assistants resulted in participation and completion rates of over 80% and 90%, respectively, in all groups. In terms of feasibility, the use of mixed-mode options, including QR codes, to offer participants the opportunity to choose, might be a relevant strategy. Clinical Trial: N/A

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# How to increase participation and completion rates in questionnaire surveys of primary care patients? A randomized study


Running headline: Participation and completion rates for questionnaire surveys

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## Abstract

**Background:** Participation and completion rates are often low in questionnaire-based surveys where participants are recruited by post, e-mail, or telephone.

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**Methods:** In this randomized study conducted in 2023 in France, five research assistants recruited 974 consecutive patients from 39 practices. Participants were randomized into four groups using simple randomization: 'paper with incentive' (n=251), 'paper without incentive' (n=368), 'mixed mode with tablet' (n=187), and 'mixed mode with QR code' (n=168). We computed the participation and completion rates and the median number of questions answered. We used univariable/multivariable logistic and negative binomial regressions to compare the four groups.

**Results:** 822 patients (women=65.3%, median age=52) agreed to participate (participation rate=84.4%). Participation rates were not statistically different between the groups (p-value=0.23). Overall, 806 patients (98.1%) answered all 48 questions. The differences between the groups were small but statistically significant in univariable and multivariable analyses (median number of questions answered=48 for all groups; completion rate=99.8% for paper, 96.8% for paper/tablet, and 93.3% for paper/QR code, p-values=0.01).

**Conclusions:** Recruiting patients in waiting rooms with the help of research assistants resulted in participation and completion rates of over 80% and 90%, respectively, in all groups. In terms of feasibility, the use of mixed-mode options, including QR codes, to offer participants the opportunity to choose, might be a relevant strategy.

## Introduction

Questionnaire-based surveys are valuable tools in a variety of research areas, including healthcare. For example, they allow data to be collected on patients' experiences, opinions and behaviors, which helps healthcare professionals to better understand their needs and improve the quality of care. Apart from the fact that they are generally inexpensive and take little time, one major advantage of questionnaire-based surveys lies in the flexibility they can offer in terms of the mode of administration (i.e., face-to-face interviews, telephone interviews, paper or online questionnaires completed at home or elsewhere).

However, to maintain a good level of representativeness and avoid selection bias, it is crucial to obtain high participation and completion rates. For surveys with postal, email or telephone recruitment, several studies showed that participation rates (especially for online questionnaires)[1–4] and completion rates (especially for paper questionnaires)[1,2] tended to be relatively low, whether the participants were individuals, patients or physicians. Other studies showed that physicians' participation and completion rates were generally lower than those of the general population, probably mainly because of their workload in the practice and the increasing frequency with which they were asked to respond to surveys.[5,6] Although participation and/or completion rates are generally particularly low among physicians, these rates may also be suboptimal in studies with patients.[7] This means that the results of a large number of surveys conducted with patients may not be representative of the target population as a whole and may therefore lead to misleading conclusions.

Among the factors likely to influence participation and completion rates, the method chosen to collect the data and the use of incentives are key elements.[8–12] Mixed-modes, i.e. the use of several methods in the same study, seem particularly useful for improving

participation rates.[10,13] To our knowledge, QR codes have only been the subject of a few studies, focusing on specific populations and with limited sample sizes.[12,14–16] The usefulness of mixed-modes including QR codes to improve participation and completion rates to a questionnaire has not yet been explored in general practice.

The aim of this study was to compare the participation and completion rates for a 48-question survey between a paper questionnaire group with incentive, a paper questionnaire group without incentive, and two mixed-mode groups (i.e., paper or online with tablet, and paper or online via QR code). Patients were recruited by research assistants who were available to answer their questions if necessary. We hypothesized that mixed-mode groups and incentives would improve participation and completion rates.

## Methods

*Design, setting and study population*

This randomized study, carried out in 2023 in the Rhône-Alpes region (France), was part of an environmental health project aimed at profiling different patterns of meat consumers in primary care, with a view to designing brief interventions to reduce meat consumption.

We used a professional register of primary care physicians (PCPs) from which we randomly extracted 200 physicians using computer-generated random numbers. Five research assistants contacted each randomly selected PCP by email until the required number of physicians (i.e., n=39) was reached. If the PCP refused to participate, or if there was no response after three consecutive reminders, we contacted the next practice on the list.

We used simple randomization to allocate our sample of medical practices into four groups using computer-generated random numbers. Fifteen practices were randomized into the 'paper without incentive' group, 10 into the 'paper with incentive' group, 7 into the 'paper or online with tablet' group (i.e., patients were given the option of using either paper or a tablet provided by the researchers), and 7 into the 'paper or online via QR code' group (i.e., patients were given the option of using either paper or a QR code if they had their smartphones with them). We used computer-generated random numbers to determine the day of the week on which the study would be carried out in each practice.

Given the environmental health theme of the study, the non-monetary incentive was an origami paper containing a seed. We used unconditional incentives, i.e. the incentives were given to all patients, regardless of their willingness to complete the questionnaire. Participants were non-urgent, French-speaking, consecutive adult patients who were able to understand the study and give written informed consent. The study was approved by the

Research Ethics Committee of the University College of General Practice, Lyon (project ID IRB 2023-01-03-01).

*Data collection*

Participants were informed by a poster and recruited in the waiting room by a research assistant (20-25 patients per practice) between 9 January 2023 and 16 June 2023. The research assistant verified that the inclusion criteria were met and was available to answer any questions from the participants. The questionnaire, available as supplementary material (Supplementary Material), consisted of 48 questions: four sociodemographic questions (age, gender, postcode and occupation), the French version of the feeling of the Sense of Coherence Scale (=17 questions), the French version of the Meat Attachment Questionnaire (=17 questions), and a questionnaire on intentionality adapted from previous studies (=10 questions).[17–19] The questionnaire generally took about 10 minutes to complete. The paper and online questionnaires were designed to be as similar as possible. In the two mixed-modes (i.e., with tablet or QR code), we included an alert indicating that one or more questions were not answered. However, to be consistent with the paper version, participants did not have to answer all the questions before submitting the questionnaire online.

*Statistical analyses and sample size determination*

Based on previous studies,[7,20] and anticipating a worst-case scenario, we estimated that the proportion of patients participating in the study would be approximately 50%. We wanted a 95% confidence interval [95% CI] of no more than +/- 0.05 and a power of 80%. Using the formula for estimating a proportion, we found that the minimum required sample size would be 400. Taking into account clustering within PCP practices (intra-class correlation

coefficient=0.05, expected number of patients recruited per PCP=20), the required sample size would be 780 (i.e., 39 clusters of 20 patients).

We computed the proportion of patients who agreed to take part in the study (=participation rate). In addition, using the 'egen' command in Stata with the 'rowmiss' function that gives the number of missing values for each observation, we calculated the median number of questions answered and the interquartile range (IQR), as well as the proportion of patients who answered all the questions (=completion rate).

Then, we used logistic regressions to assess whether the participation rate was statistically different between groups according to initial randomization group, and negative binomial regressions to assess whether the number of questions answered was statistically different between groups according to initial randomization group, questionnaire format chosen, gender, and age group (<40, 40-60, ≥60). We were unable to ascertain whether the participation rate varied significantly according to gender and age group, as in line with the recommendation of the ethics committee we did not record socio-demographic data in this study for patients who refused to participate. We adjusted for intra-cluster correlation within practices (for univariable and multivariable models), and for gender, age group and occupation (for multivariable models). All analyses were carried out with STATA 15.1 (College Station, TX).

## Results

The flowchart for the study is shown in Figure 1. From the list of 200 PCPs, 189 were contacted, of whom 39 (20.6%) agreed to participate. The study included fifteen PCPs in the 'paper without incentive' group, ten PCPs in the 'paper with incentive' group, seven PCPs in the 'paper or online with tablet" group, and seven PCPs in the 'paper or online via QR code' group.

The study sample consisted of 974 consecutive non-urgent patients who were recruited from these 39 medical practices, representing an average of 25 patients per practice (min=16, max=37). They were 251 patients in the 'paper with incentive' group, 368 in the 'paper without incentive' group, 187 in the 'mixed mode with tablet' group, and 168 in the 'mixed mode with QR code' group (Figure 1). Of these patients, 822 agreed to participate in the study, resulting in a participation rate of 84.4% (women=65.3%, median age=52, IQR=31, min-max=20-93, <40 years=29.2%, 40-60 years=32.6%, >60 years=38.2%). The distribution of women and men and by age group was similar in all four groups (p-value=0.91 for gender and 0.08 for age group).

The participation rate ranged from 81.5% in the 'paper without incentive' group to 88.7% in the 'mixed mode with QR code' group, but the differences between the groups were not statistically significant (Table 1). The incentive did not lead to a significant increase in the participation rate (incentive vs. no incentive: OR=1.45 [95%CI=0.84-2.49], crude p-value 0.18). Fifty-one patients in the 'paper or online with tablet" group and 66 in the 'paper or online via QR code' group preferred to complete the questionnaire using the paper version.

Overall, 806 patients (i.e., 98.1% of patients) answered all 48 questions on the questionnaire. For the remaining 16 patients, the number of missing data ranged from one

to 38. These patients were divided as follows: one patient belonged to the paper group, 5 to the tablet group and 10 to the QR code group. The differences between the groups were small but statistically significant in both univariable and multivariable analyses (Table 1). By contrast, the differences were not statistically significant for incentive, gender, and age group, but the number of patients with missing data was low (Table 1).

# Discussion

*Main findings*

This study involved French primary care patients, recruited by research assistants and invited to complete a 48-question survey in the waiting room. We found that the participation rate was over 80% for all groups and that, when given the choice, a number of patients (n=117) preferred to complete the paper rather than the online questionnaire. We also found that the completion rate was 99.8% for the paper questionnaire and only slightly less for the online questionnaire. Finally, we found that the incentive had no influence on the participation rate or the number of questions answered.

*Comparison with the existing literature*

Compared with other studies,[8,20,21] we achieved excellent participation and completion rates in all groups (for participation rates, much higher than the 60% recommended in some publications[22]), despite a relatively lengthy self-administered questionnaire comprising 48 questions on a sensitive topic. The results of our study tend to reinforce the already known information that, among primary care patients, the response rate may not be affected by the length of the questionnaire, provided that the total duration is less than 15-20 minutes,[23,24] which was the case in our study.

We found that the use of mixed options (paper/online), although intended to adapt more precisely to the preferences of each participant, did not appear to add value in terms of participation and completion rates. However, the online format (or mixed options) may be preferred for other reasons such as improved feasibility. Compared to paper questionnaires, the online format generally allows data to be obtained more cheaply (less printing/mailing/typing costs), more quickly (real-time data tracking and less typing) and

more accurately (the structured format minimizes incorrect entries and automatic data transfer minimizes data entry errors).[25] Alongside the usual methods for collecting data online, QR codes have recently come into use in questionnaire surveys. They are simple and effective tools that are known to increase user engagement.[26] In a UK population-based maternity study, the inclusion of QR codes in the survey tended to lead to an increase in response rate, but this effect was limited and was probably also related to other factors (prior notification, short questionnaire, personalized study material, additional reminder).[9] In this English study, the initial response rate (30%) was considerably lower than ours.

The results of our study suggest that face-to-face recruitment with a research assistant achieves high participation and completion rates, providing support to participants. Previous studies have already highlighted that this strategy was associated with significantly higher participation rates.[7,13,27] Administering a face-to-face survey in the waiting room has the potential advantage of capturing patients' experiences when they are most accessible, with fewer competing demands than in other situations.

We found that, in the presence of a research assistant, neither the mixed-mode, as discussed above, nor the unconditional non-monetary incentive seemed to have any effect. Non-monetary incentives are recognized as important factors in improving the recruitment of participants to health-related surveys, with the impact being greater when the incentive is unconditional.[28] In our study, the high participation rate probably prevented us from observing a significant effect in the different methods tested. The presence of a research assistant seems to be the most powerful incentive, probably due to a desirability bias. This could be verified by carrying out the study using the incentives in the presence or absence of a research assistant.

*Significance and recommendations for future research*

This study makes a valuable contribution to the methodology of survey-based research in healthcare by underscoring the impact of recruitment strategies on both participation and completion rates. The notably high rates we observed across all groups suggest that face-to-face recruitment by a research assistant may be a critical factor for ensuring representativeness, especially in primary care settings where patient engagement can be challenging. Researchers conducting survey studies in similar environments may benefit from prioritizing in-person recruitment with trained personnel, as our findings indicate that this approach effectively mitigates common barriers to participation, such as lack of time. Additionally, while mixed-mode survey options (including QR codes) did not significantly increase participation in this study, these tools still offer logistical advantages, such as ease of data collection, reduced error rates, and potential cost savings. For research teams looking to optimize both response rates and operational efficiency, mixed-mode strategies may still be worthwhile. Future studies may benefit from investigating the impact of assistant-supported recruitment in different contexts or exploring alternative incentives, such as monetary incentives, that could further enhance response rates, particularly in larger or more geographically diverse samples.

*Limitations*

First, the results of our study cannot be generalized to all questionnaire-based surveys. Several studies showed that surveys carried out by recruiting participants by email, post or telephone often lead to mediocre participation rates for the online format[1–4] and mediocre completion rates for the paper format.[1,2] In this type of study, mixed-mode options and/or incentives could be useful for positively influencing participation and completion rates. Second, selection bias is always possible in this type of survey, but in our opinion, it was reduced to a minimum by selecting physicians at random, including patients consecutively,

and obtaining a high participation rate. In the context of our study, where patients were present in the waiting room, the selection biases usually described for electronic surveys in general practice do not apply.[29,30] Third, the study was carried out in only one region of France and only with primary care patients. The results obtained could have been different for other regions or countries, or for other study populations (physicians or patients visiting specialists).

## Conclusion

In conclusion, by recruiting patients in the waiting room with the help of a research assistant providing support to participants, we obtained a participation rate of over 80% in all groups. Neither the choice of response mode (i.e., single or mixed, with or without QR code), nor the use of incentives markedly influenced participation or completion rates. Future research would be useful to compare these rates with and without the presence of a research assistant in the waiting room to answer questions from participants. In terms of feasibility, the use of mixed options, including innovative methods such as QR codes, to offer participants the opportunity to choose, might be a relevant strategy, despite the results of our study showing no superiority in terms of participation and completion rates.

**Patient and public involvement:** Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

**Data availability statement:** The data associated with this article are available from the corresponding author upon reasonable requests.

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Table 1. Participation and completion rates and median number of questions answered, according to initial randomization group, chosen questionnaire format, gender, and age group[1]

| | Participation rate, n/N (%) | Odds ratio (OR) | p-value[2] | Number of patients having fully completed the questionnaire, n/N (%) | Median number of questions answered (IQR, min-max) | Incident rate ratio (IRR) | p-value[3] | Incident rate ratio (IRR) | Adjusted p-value[4] |
|---|---|---|---|---|---|---|---|---|---|
| Initial randomization group (n=822) | | | 0.23 | | | | 0.01 | | 0.01 |
| Paper | 517 / 619 (83.5) | 1 | | 516 / 517 (99.8) | 48 (0, 47-48) | 1 | | 1 | |
| Incentive[5] | 217 / 251 (86.5) | | | 217 / 217 (100) | 48 (0, 48-48) | | | | |
| No incentive[5] | 300 / 368 (81.5) | | | 299 / 300 (99.7) | 48 (0, 47-48) | | | | |
| Paper or tablet | 156 / 187 (83.4) | 0.99 (0.55-1.80) | | 151 / 156 (96.8) | 48 (0, 10-48) | 0.99 (0.98-1.00) | | 0.99 (0.98-1.00) | |
| Paper or QR-code | 149 / 168 (88.7) | 1.55 (0.91-2.63) | | 139 / 149 (93.3) | 48 (0, 21-48) | 0.99 (0.98-1.00) | | 0.99 (0.98-1.00) | |
| Chosen questionnaire format (n=822) | | | | | | | 0.001 | | 0.002 |
| Paper | NA | | | 633 / 634 (99.8) | 48 (0, 47-48) | 1 | | 1 | |
| Online with tablet | NA | | | 100 / 105 (95.2) | 48 (0, 10-48) | 0.99 (0.97-1.00) | | 0.99 (0.97-1.00) | |
| Online with QR-code | NA | | | 73 / 83 (88.0) | 48 (0, 21-48) | 0.98 (0.96- | | 0.98 | |

| | | | | | | | 0.99) | | (0.96-0.99) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Gender (n=821) | | | | | | | | 0.94 | | 0.75 |
| Male | NA | | | 277 / 285 (97.2) | 48 (0, 21-48) | 1 | | | 1 | |
| Female | NA | | | 529 / 536 (98.7) | 48 (0, 10-48) | 1.00 (0.99-1.01) | | | 1.00 (1.00-1.01) | |
| Age group (n=819) | | | | | | | | 0.13 | | 0.07 |
| < 40 | NA | | | 233 / 239 (97.5) | 48 (0, 10-48) | 1 | | | 1 | |
| 40 - 60 | NA | | | 265 / 267 (99.3) | 48 (0, 38-48) | 1.01 (1.00-1.02) | | | 1.01 (1.00-1.02) | |
| > 60 | NA | | | 308 / 313 (98.4) | 48 (0, 21-48 | 1.01 (1.00-1.02) | | | 1.01 (1.00-1.02) | |

[1] The questionnaire consisted of 48 questions: four socio-demographic questions, the Sense of Coherence Scale (=17 questions), the Meat Attachment Questionnaire (=17 questions), and an intentionality questionnaire developed by our research team (=10 questions)

[2] Univariable logistic regression (adjusted for intra-cluster correlation within practices)

[3] Univariable negative binomial regression (adjusted for intra-cluster correlation within practices)

[4] Multivariable negative binomial regression (adjusted for intra-cluster correlation within practices, as well as for gender, age group, occupation)

[5] Incentive vs. no incentive: participation rate: OR=1.45 [95%CI=0.84-2.49], p-value 0.18; median number of questions answered: IRR=1.00 [95%CI=1.00-1.00], p-value 0.31

Figure 1. Flowchart of the study
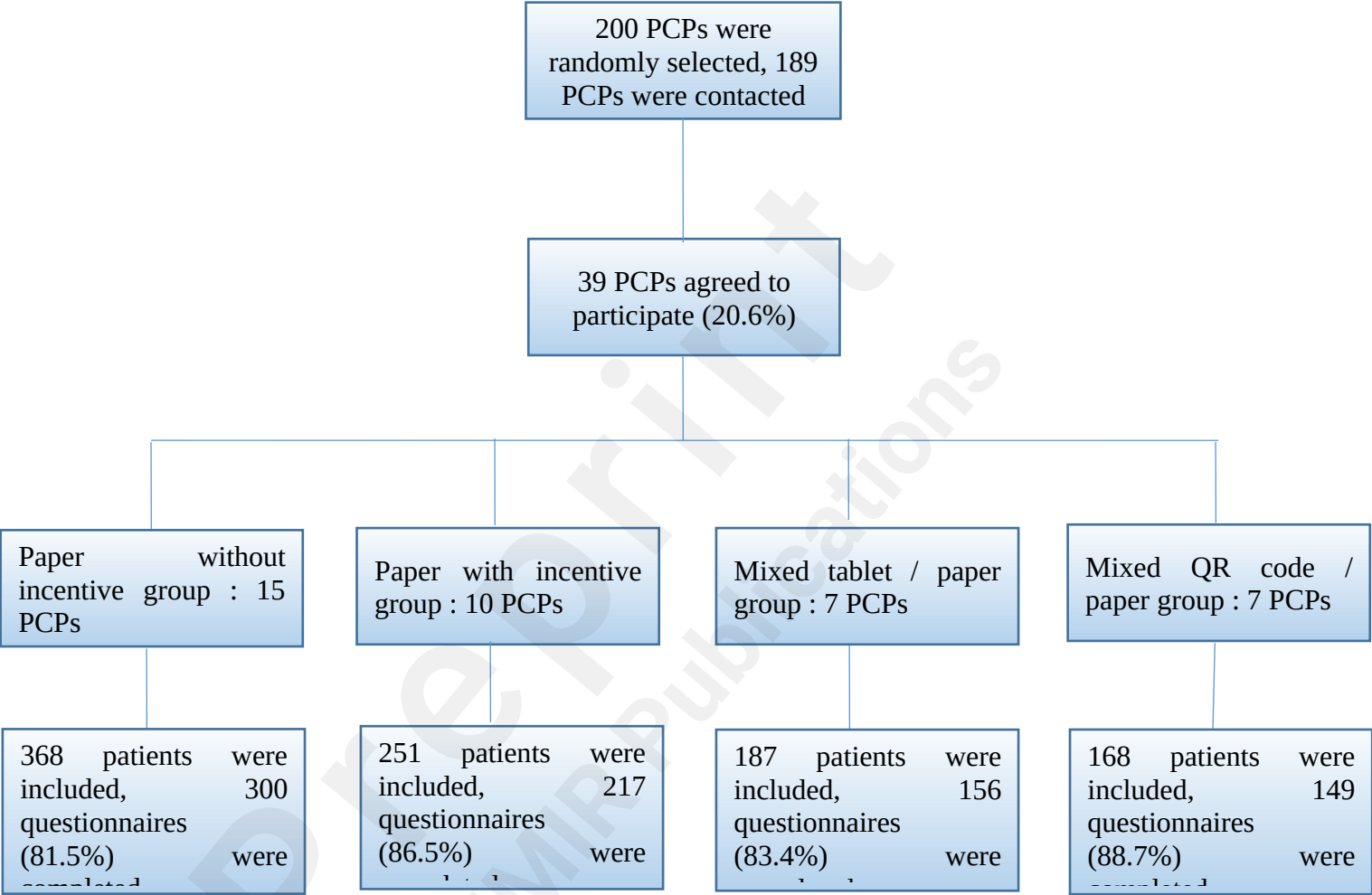
# Supplementary Files

# Multimedia Appendixes

Supplementary Material: The questionnaire used in the study.
URL: http://asset.jmir.pub/assets/976667f2f9aa904bced4a8e0d018fd46.docx

# CONSORT (or other) checklists

Untitled.
URL: http://asset.jmir.pub/assets/14087ec796d647d0f75d0e1a022da7f8.pdf