Does It Pay to Pay?

A Randomized Trial of Prepaid Financial Incentives and Lottery Incentives in Surveys of Nonphysician Healthcare Professionals

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► ***Background:*** Monetary incentives in survey research may provide important gains from a methodological perspective in the control and reduction of survey error associated with potential nonresponse of participants. However, few studies have systematically investigated the use of monetary incentives or other methods to improve the response rates in the nonphysician clinician population.

► ***Objective:*** To investigate differences in response rates to a mailed self-administered survey of nonphysician clinicians who were randomized to receive a prepaid monetary incentive, a postsurvey prize drawing, or no incentive.

► ***Methods:*** A randomized controlled trial of financial incentives was conducted from November 2002 to February 2003. Nonphysician clinicians (nurse practitioners [NPs] and physician assistants [PAs]; $N = 3{,}900$) randomly selected to participate in a national ethics-related study were assigned randomly in equal allocations ($n = 1{,}300$ [650 NPs, 650 PAs]) to three incentive groups: (a) no incentive; (b) a $5 prepaid token incentive in the initial mailing; or (c) a chance to win one of ten $100 prize drawings upon completion and return of a self-administered survey.

► ***Results:*** A $5 cash incentive increased survey response rates to an adjusted 64.2%: a 19.5 percentage point increase over the lottery group (44.7% response rate), and a 22 percentage point increase over the control group (42.2% response rate).

► ***Discussion:*** A nominal cash incentive of $5 yields a significantly higher response rate from nonphysician providers than receiving either a lottery option or no incentive.

► ***Key Words:*** nonphysician clinicians · randomized trial · response rate · survey

Survey researchers have recognized that a variety of factors influence response rates to mailed questionnaires (Dillman, 1978, 2000; Edwards et al., 2002; Fox, Crask, & Kim, 1988; Heberlein & Baumgartner, 1978). Although mail surveys yield an overall lower response rate than telephone or face-to-face interviews, they allow for privacy when responding to questions and are cost-effective (Lessler & Kalsbeek, 1992; Trinkoff & Storr, 1997; VanGeest, Wynia, Cummins, & Wilson, 2001). In addition, in surveying sensitive research topics such as ethics with different populations, the use of financial incentives with postal questionnaires provide an effective means to gather data with limited interviewer bias, potentially yielding higher response rates. Although much of the literature focuses on the use of financial incentives in physician groups, little information about the use of incentives in allied healthcare providers exists. It would be useful to know if monetary incentives increase response rates as they do with physicians (James & Bolstein, 1990; Martinson et al., 2000; Trinkoff & Storr, 1997).

Methods to improve responses to surveys of physicians have consisted of both monetary and nonmonetary incentives (Asch, Christakis, & Ubel, 1998; Halpern, Ubel, Berlin, & Asch, 2002; VanGeest et al., 2001). Edwards and colleagues (2002) reported several successful strategies to improve response rates. The odds of responding

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were twice as high with the use of a financial incentive than with no incentive. Asch and colleagues (1998) reported a higher response rate in a physician sample (N = 1,000) randomized to receive a $5 bill in the initial mailing versus a $2 bill (61% vs. 46%, respectively). Conversely, in a sample of 873 physicians, VanGeest et al. (2001) reported no significant differences in the response rates of physicians across three incentive categories: $5, $10, and $20. Similarly, Doody et al. (2003) used a combination of cash, checks, and delivery methods (first-class U.S. mail versus Federal Express) in an effort to improve response rates among nine random samples of 300 nonresponders each from a large cohort investigation of cancer risk among U.S. radiographic technologists. They found the $2 cash incentive to be the most effective at increasing response among the cash incentives used.

The odds of responding were twice as high with the use of a financial incentive than with no incentive.

Although limited studies exist of nonphysician providers, Trinkoff and Storr (1997) reported a 78% response rate to an anonymous survey of substance use of practicing RNs; a $1 incentive and a #2 mechanical pencil was enclosed with the questionnaire. Likewise, in a survey of NP's involvement in health policy affairs, Oden and Price (1999) reported a significant difference in response rates between those NPs who received a $1 incentive in the first mailing versus no incentive.

Researchers with limited budgets also may consider other types of incentive strategies such as a lottery to yield a comparable response rate at a lower cost. Exploration of sensitive survey topics in differing populations in a cost-effective manner necessitates knowing more about the effect of incentives on response rates. The effect of different types of incentives will assist in designing future ethics-related studies. The purpose of this study was to evaluate the effectiveness of the two types of monetary incentives ($5 or lottery) on response rates in nonphysician providers.

Methods

Study Population

The study population included nurse practitioners (NPs) and physician assistants (PAs) currently practicing in primary care or primary care subspecialties (i.e., family health, pediatrics, geriatrics, obstetrics/gynecology, internal medicine, adult health) in the United States.

Sample

National lists of NPs and PAs were obtained from Medical Marketing Services and a total of 3,900 individuals (NPs [n = 1,950] and PAs [n = 1,950]) were randomly selected from the lists. These lists include the American Academy of Physician Assistants, a national organization that represents PAs, and a comprehensive NP list derived from medical and nursing boards of the 50 states and the District of Columbia.

The stratified samples were assigned randomly in equal allocations to one of three incentive groups: (a) no incentive (n = 1,300); (b) a $5 prepaid token incentive in the initial mailing (n = 1,300); or (c) a chance to win one of ten $100 prize drawings upon completion and return of a self-administered survey (n = 1,300). This was accomplished through the use of a random number generator. After undeliverable (1.9%) and other identifiable disqualified respondents (i.e., no longer practicing, nonprimary care provider) were removed, the group sample sizes were as follows: NPs (n = 1,618) and PAs (n = 1,690).

Procedures

Following institutional review board approval at the National Institutes of Health, data were collected using a paper-and-pencil measure by the Center for Survey Research at a university between November 18, 2002, and February 21, 2003. A modified version of the Tailored Design Method (TDM) of mail survey administration was used. Randomized financial incentives were added to this method to maximize participation (Dillman, 1978, 2000). The survey consisted of a national study of the ethical concerns of nonphysician clinicians that arise in the course of practice. The questionnaire explored the relationship between individual, organizational, and state regulatory factors and ethical conflicts in practice and the perceived delivery of quality care. Four contact mailings were made: (a) an initial cover letter of invitation with the survey questionnaire and a return self-addressed stamped envelope (SASE); (b) a postcard follow-up reminder; (c) a second cover letter of invitation and replacement questionnaire; and (d) a final postcard sent to all nonrespondents to indicate closure of the study and to ask once again to consider returning the questionnaire.

Participants received identical information except for information on the incentives. For those assigned to the cash incentive group, a $5 bill was affixed to the cover letter, which was included only in the first mailing. For participants in the lottery group, a green paper insert was added with the cover letter informing them of their chance to be one of 10 winners of $100 dollars upon completion and return of the survey. The initial cover letter also provided a procedure for respondents who chose not to participate, in the form of a check-box in a tear-off section of the cover letter to be returned with the materials in the SASE. This allowed the removal of these individuals from the list, thus eliminating further follow-up. Confidentiality was maintained by using sequential identification numbers when entering the data. Return of completed materials implied consent to participate.

Data Analysis

The reported response rate corresponds to the response rate 3 (RR3) calculation developed by the American Association for Public Opinion Research (AAPOR, 2000), which estimates the proportion of cases of unknown eligibility that

are actually eligible for the study. This rate is designed to more accurately estimate the true rate of survey response. The eligibility estimate for unknown cases is based upon the eligibility rate for known respondents; this calculation, therefore, incorporates a conservative estimate of ineligibility among cases with unreturned mail. A detailed explanation of this response rate can be found at AAPOR standard definitions (http://www.aapor.org). The differences among incentive groups were constant whether the unadjusted or RR3 calculations were used. In addition, chi-square tests were used to evaluate the response rates of practitioners in each incentive arm and by profession and to examine sociodemographic differences of each clinician group by assignment group; two sample *t* tests were used for continuous variables. For all comparisons, a two-sided significance level of $\alpha = .05$ is assumed.

Results

Nonphysician clinicians were primarily female (79.8%) and White (90.4%), with a mean age of 44.9 years ($SD = \pm 9.0$, range = 23–70; Table 1). Nearly two thirds (61.3%) received their advanced practice preparation at the master's level. The mean number of years as a practitioner was 10.5 years ($SD = \pm 7.7$, range 1–20). A large percentage of the participants (41.1%) were practicing as family practitioners at the time of the survey. More than a quarter of the respondents were in a group practice of 3 to 10 physicians (28.5%)

TABLE 1. Demographic Characteristics of Nurse Practitioners and Physician Assistants

Characteristic	Overall Sample *N* (%)	Nurse Practitioner *n* (%)	Physician Assistant *n* (%)	*p*[a]
Age (years)				
<29	85 (5.5)	23 (2.8)	62 (9.1)	
30–39	339 (22.1)	158 (19)	180 (26.5)	
40–49	583 (38.7)	343 (41.2)	240 (35.3)	<.001
50–59	423 (28.1)	245 (29.4)	177 (26)	
≥60	75 (5.0)	53 (6.4)	21 (3.1)	
Mean ± *SD*	44.9 ± 9.0	46.3 ± 8.4	43.2 ± 9.5	<.001
Gender				
Male	308 (20.2)	42 (5.0)	266 (38.8)	<.001
Female	1213 (79.8)	790 (94.8)	420 (61.2)	
Years as a practitioner				
Mean ± *SD*	10.5 ± 7.8	9.53 ± 7.2	11.8 ± 8.2	<.001
Years in current position				
Mean ± *SD*	5.89 ± 5.4	5.86 ± 5.4	5.93 ± 5.3	.815
Race				
Asian	29 (1.9)	13 (1.6)	16 (2.4)	
Black	59 (4.0)	25 (3.0)	33 (4.9)	.020
White	1349 (90.4)	758 (92.7)	586 (87.6)	
Other	55 (3.7)	21 (2.5)	34 (5.0)	
Work sector				
For-profit	846 (56.3)	410 (49.2)	432 (64.3)	<.001
Not-for-profit	657 (43.7)	413 (49.6)	240 (35.7)	
Geographic location				
Urban	543 (35.8)	318 (38.2)	225 (33.1)	
Suburban	547 (36.1)	269 (32.3)	272 (40.1)	.008
Rural	427 (28.1)	242 (29.1)	182 (26.8)	
Employment				
Full-time	1156 (75.9)	581 (69.7)	573 (83.3)	<.001
Part-time	357 (23.4)	243 (29.2)	113 (16.4)	

Note. Percentages may not equal 100 because of rounding and missing data.
[a]Chi-square *p* comparing nurse practitioners versus physician assistants for categorical variables, *t* tests for continuous variables.

TABLE 2. Response Rates for Complete Responders by Type of Practitioner Response Rate[a]

Incentive Group		Eligible Sample Size *N*	Eligible Sample Size *n*	Response Rate *N* (%)	Response Rate *n* (%)	Difference in Response Rate: NP%– PA% (95% CI)	*p*[b]
Total sample	Overall	2,954		1,494 (50.6)			
	NP		1,441		802 (55.7)	10.2 (6.6, 13.7)	<.001
	PA		1,521		692 (45.5)		
Control	Overall	957		404 (42.2)			
	NP		470		226 (48.1)	11.8 (5.6, 18.0)	<.001
	PA		491		178 (36.3)		
Lottery	Overall	981		438 (44.7)			
	NP		474		231 (48.7)	8.0 (1.8, 14.2)	.012
	PA		508		207 (40.7)		
Cash	Overall	1016		652 (64.2)			
	NP		496		345 (69.6)	10.9 (5.0, 16.7)	<.001
	PA		523		307 (58.7)		

Note. NP = nurse practitioner; PA = physician assistant; CI = confidence interval.
[a]Response rate corresponds to the response rate 3 calculation developed by the American Association for Public Opinion Research (AAPOR). Please refer to AAPOR standard definitions for a detailed explanation of this response rate (http://www.aapor.org) or contact the author for further information. The unadjusted rates are available from the author upon request.
[b]*p* comparing difference in response rate for NP versus PA.

with for-profit status (56.3%) in a suburban area (36.1%). The NPs were more likely to be female and older ($p < .001$), reporting slightly fewer years as a practitioner than their PA colleagues, and currently practicing in a not-for-profit organization ($p < .001$ for each comparison). There were no significant differences in sociodemographic factors (i.e., age, years as a practitioner, or years in current practice) of NPs or PAs within each incentive group or among the incentive groups. The study achieved a 50.6% overall response rate (AAPOR RR3), with a 64.2% response in the cash group, 44.7% in the lottery group, and a 42.2% response in the control group (Table 2). The response rate in the cash group was significantly higher than in both the control group ($p < .001$) and the lottery group ($p < .001$) (Figure 1) and these differences were evident when examined by response to the first mailing alone. Of those who completed and returned the questionnaire, nearly two thirds of respondents (65%) who received the cash incentive in the initial mailing completed the questionnaire and returned it prior to receiving a postcard reminder, significantly more than the control (44%) and lottery (53%) groups (both $p < .001$; Table 3).

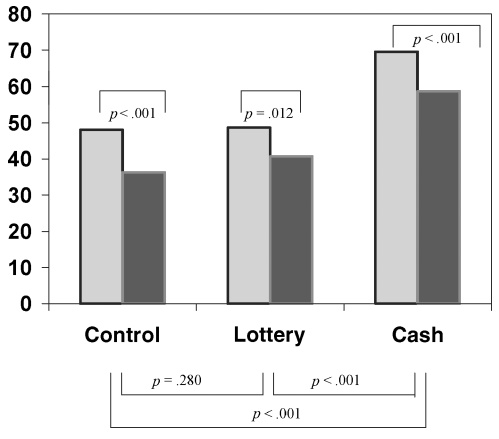

FIGURE 1. Response rate by incentive group and practitioner type. □ NP; ■ PA.

Discussion

The data show that similar to physicians, the inclusion of a token $5 monetary incentive in the initial mailing had an impact on the response rate of nonphysician clinicians, bringing it to 64.2%, a 22 percentage point increase over the control group (42.2%). These data are consistent with the meta-analytic review by Church (1993) who reported a 19.1 percentage point difference by offering participants a prepaid monetary incentive with the initial mailing. Other researchers found that a modest incentive of $1 improved response rates in a sample of NPs by 15 percentage points over the control group (81% vs. 66%; Oden & Price, 1999). However, the amount of an optimal initial cash incentive remains unclear.

The difference in response rates between professional group respondents is noteworthy. Asch, Jedrziewski, and Christakis (1997) reported a difference in mean response rates between nurse respondents (61 ± 23) and other

TABLE 3. Number of Returns Per Mailing by Incentive Type—Complete Responders Only

	Invitation and Questionnaire		Postcard Reminder		Replacement Questionnaire		Final		Total	
Group	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Control	176	43.6	56	13.9	88	21.3	84	20.8	404	42.2
Lottery group	230	52.5	67	15.3	62	14.2	79	18.0	438	44.7
Cash group	423	64.9	91	14.0	70	10.7	68	10.4	652	64.2

healthcare workers (56 ± 24). Although these authors broadly defined these sample categories, our response rates for the professional groups we studied appear similar. The fact that NPs were more often female than PAs could have possibly had some effect on response rate, because respondents were slightly more likely to be female (78.9% vs. 75.4%, $p < .001$) than nonrespondents. Moreover, because the lead authors for this study were members of the nursing discipline as identified to the potential subjects in the cover letter of invitation, it is possible that a sense of professional responsibility encouraged an intrinsic motivation on the part of NPs to participate. Because these data are limited to primary care providers, the social usefulness of understanding the ethical issues nonphysician clinicians face in primary practice may have encouraged a response. Participants may have perceived the survey as a mechanism for voicing ethical concerns associated with practice.

The published data on lottery effectiveness is inconsistent, yielding both positive and negative effects. The current lottery option did not significantly increase response rates over no incentive (2.5 percentage points; $p = .28$). The potential to win $100 may not have been perceived as enough incentive to trigger participation. However, because some authors (Baron, Wals, & Milford, 2001; Warriner, Goyder, Gjertsen, Hohner, & McSpurren, 1996) have indicated that lotteries appeal to the pecuniary interests of individuals, this offer may have been perceived as inappropriate by some given the overall ethics-related aspect of the study. Singer (2002) suggests that lotteries may function as promised incentives and in comparison to prepaid incentives have consistently yielded lower response rates.

More information on healthcare providers' attitudes toward the use of financial compensation in survey research would improve an understanding of participants' motivations and reasons for participation. In addition, data on how response rates using a prepaid token cash incentive rank with other reasons for participation, such as the saliency of the questionnaire, professional responsibility, importance of knowledge/altruism, or even the method of administration, would be useful. Understanding the amount of a financial incentive that is perceived as reasonable in exchange for the participant's time and associated burden—$1, $5, $10, or $100—is important, as is whether the amount should vary by specialty group surveyed. Cost-effectiveness data on differing amounts of financial incentives would help researchers justify their budgetary allocations to not only institutional review boards but also funding agencies. Determining the value of a given financial incentive strategy in relationship to response rates could potentially improve the generalizability of the data. ▼

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