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Preferences for conditional economic incentives to improve pre-exposure prophylaxis adherence: A discrete choice experiment among male sex workers in Mexico

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Abstract

Pre-exposure prophylaxis (PrEP) is highly effective in preventing HIV but requires sustained adherence. Conditional economic incentives (CEIs) can improve medication-taking behaviors, yet preferences for programs that employ CEIs to increase PrEP use among male sex workers

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(MSWs) have not been investigated. We conducted a discrete choice experiment in Mexico City to elicit stated preferences for a CEI-based PrEP adherence program among MSWs. Respondents expressed their preferences for different program characteristics: incentive amount; incentive format; incentive type; and adherence-verification method. We used a random utility logit model to estimate the relative importance of each attribute and estimated willingness-to-pay (WTP). MSWs preferred a higher, fixed incentive, with PrEP adherence measured via hair sampling. MSWs were willing to forego up to 21% of their potential maximum CEI amount to ensure receipt of a fixed payment. MSWs are highly willing to accept a CEI-based intervention for PrEP adherence, if offered along with fixed payments.

RESUMEN

La profilaxis previa a la exposición (PrEP) es muy eficaz para prevenir el VIH, pero requiere una adherencia sostenida. Los incentivos económicos condicionales (IEC) pueden mejorar los comportamientos de toma de medicamentos, sin embargo, no se han investigado las preferencias por los programas que emplean IEC para aumentar el uso de PrEP entre los trabajadores sexuales masculinos (TSM). Realizamos un experimento de elección discreta con TSM en la Ciudad de México para obtener preferencias declaradas para un programa de adherencia a la PrEP basado en IEC. Los participantes expresaron sus preferencias en cuanto a diferentes características: monto del incentivo; formato del incentivo; tipo de incentivo; y método de verificación de la adherencia. Utilizamos un modelo logit de utilidad aleatoria para estimar la importancia relativa de cada atributo y la disposición a pagar estimada (DAP). Los TSM prefirieron un incentivo fijo más alto, con la adherencia a la PrEP medida a través de muestras de cabello. Los TSM estaban dispuestos a renunciar hasta el 21% de su monto máximo potencial de IEC para garantizar la recepción de un pago fijo. Los TSM están muy dispuestos a aceptar una intervención basada en IEC para la adherencia a la PrEP, si se ofrece junto con pagos fijos.

Keywords

HIV; male sex workers; willingness to accept; adherence; PrEP; discrete choice experiment

2. INTRODUCTION

Daily oral pre-exposure prophylaxis (PrEP) is recommended for people at substantial risk of HIV infection as part of a combination prevention approach (1). Men who have sex with men (MSM) are one of the populations most at risk for HIV infection, particularly male sex workers (2), yet face multiple barriers to sufficiently high PrEP adherence, including prohibitive medication costs (3,4), stigma (3–6), fear of short- and long-term side effects (3,7,8), behavioral risk factors such as drug and alcohol use (3,8,9), irregular daily routines (10–12), and reduced access to health services (13). Though barriers to PrEP adherence among MSM are well documented, limited evidence exists surrounding the unique adherence barriers faced by male sex workers (MSWs). Economic constraints lead MSWs to engage in higher risk sexual behaviors while social deprivation limits their access to HIV prevention services and ability to adhere to lifesaving medications (14).

Behavioral economics theory suggests that cognitive biases in decision-making (e.g., over/under weighting the present when deciding between immediate versus future benefit/costs) (15) could affect PrEP use behaviors. Sex workers in low socioeconomic settings exhibit strong present bias by valuing the immediate economic benefit of unsafe sexual behaviors above the potential future costs of poorer health or HIV infection (16,17). To address biases in decision-making, small *conditional economic incentives* (CEIs) can make an outsized difference in individual health behaviors by counteracting present-biased preferences and helping individuals to decide against the immediate economic benefit of risky sexual behaviors such as condomless sex (17). One study among MSWs in Mexico demonstrated that financial incentives increased clinic visits by 10–13 percentage points and condom use by 10–15 percentage points relative to controls not receiving CEIs (18). CEIs are likely to help offset immediate economic costs in the context of PrEP adherence (e.g., the need to obtain PrEP, transport and wait time costs, the need to take medication regularly and to obtain refills, etc.). Although benefits and costs are components of value assessment, understanding whether adherence is driven by immediate benefits *or* costs can inform aspects of program design. MSWs could overweight the present in the sense of overweighting immediate benefits (*or* costs) relative to future benefits (*or* costs). On-going research highlights the urgent need for further research on the optimal use of CEI for PrEP adherence (optimal in terms of incentive amount, types of payment, incentive format, adherence verification method, etc.) (19,20).

CEIs have been shown to increase rates of HIV testing and voluntary male circumcision and can improve other HIV prevention and treatment outcomes in low- and middle-income countries when implemented appropriately (16). Programs that employ economic incentives may offer a promising strategy for increasing PrEP adherence among MSWs. More generally, PrEP utilization rates among MSM in Mexico are low. The total number of PrEP users in Mexico is approx. 3,000–3,500 (21,22). Adherence rates have not been reported for the ImPrEP project (23). An ongoing randomized trial (n=108 MSWs), the first to provide PrEP among MSWs ([ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT03674983) identifier: NCT03674983), will report adherence rates in future research. However, more evidence is needed to ensure that program components align with the specific needs and preferences of this population.

This study uses a discrete choice experiment (DCE) to measure preferences of MSWs in Mexico City with respect to utilization of economic incentives for PrEP adherence. This research contributes to the PrEP adherence literature by assessing MSWs' preferences to determine the need and nature of adherence interventions for this population. To the best of our knowledge, this is the first DCE to explore preferences for CEI-based interventions to increase PrEP adherence among male sex workers in any setting.

3. METHODS

2.1 Study population

Using social networking and community outreach, we gathered preference data from a convenience sample of 200 male sex workers in Mexico City from August 2018 to June 2019. MSWs were recruited in the community at public meeting points where they generally engage in sex work: *La Alameda*, *Zona Rosa*, and *Metro Hidalgo*. MSWs who met the

following criteria were eligible to complete the DCE survey: (i) 18 years of age or older; (ii) assigned male sex at birth; (iii) self-reported sexual penetration or oral sex in the last six months with at least eight men; (iv) self-reported having exchanged money, drugs, alcohol or gifts for sex a minimum of 8 times in the last month; (v) had tested negative for HIV at least once in the past six months; (vi) able to read and speak Spanish fluently; and (vii) able to provide written informed consent for study participation.

2.2 Discrete Choice Experiment (DCE) Design

The discrete choice experiment relied on random utility theory (RUT), which posits that people generally choose the situation that maximizes their own utility (24). RUT allows latent utilities to be summarized by two components: a systematic (explainable) component and a random (unexplainable) component (25). Previous literature has shown that MSWs in this setting are able to understand DCE elicitation methods and can make choices that are consistent with maximizing utility (26).

The DCE design process (Figure A1 in Annex 1 of Supplemental Material) was developed based on a review of the literature and findings from prior studies conducted among MSWs in Mexico (18). We implemented a choice-based conjoint (CBC) survey to present a series of hypothetical CEI-based PrEP adherence programs, each containing a number of attributes consisting of multiple levels. The DCE attributes included the following. (1) Incentive amount: CEI amount of payment in Mexican pesos. (2) Format for CEI payment: voucher for groceries or food at a wide range of supermarkets, or electronic gift card, which works like a pre-paid debit card that can be used at a wide range of stores or for online shopping. (3) Type of CEI: whether the incentive would be provided as a fixed payment (of amount \$X) or a lottery (that is, a conditional economic incentive with a 50% chance of winning \$2X and a 50% chance of winning nothing (i.e., \$0); the incentive was conditional because it was tied to returning to a 3-monthly clinic visit and potentially also, depending on participants' preferences, a verified adherence test (via blood or hair test). (4) Adherence test type: The metric used to objectively measure PrEP adherence (antiretroviral concentrations found in blood or hair samples). Multiple choice profiles were combined to form a choice task, in which participants were asked to select their preferred option. A detailed description of the DCE is provided in Annex 2 of Supplemental Material, including details on attributes and levels (Annex Table A1) and screenshots (Annex Figure A2). The DCE experimental design followed guidelines for best practice (27).

2.2.1 Data collection and pilot testing.—Before applying the DCE questionnaire extensively in the community, we piloted the survey with n=10 MSWs during clinic appointments at *Clinica Condesa* in Mexico City, which offers HIV and other sexually transmitted infections health services for MSM in a safe and private location. During pilot testing, we verified duration, clarity, flow and understanding of the choice experiment as well as the security and reliability of electronic data transfers using an internet-based platform. The final DCE questionnaire was administered, via computer tablets, by trained interviewers who were experienced in working with MSWs at Condesa clinic and at meeting points in the community. The questionnaire took approximately 50 minutes to complete: 10 minutes for a PrEP education video and 40 minutes for survey administration. MSWs

received a voucher equivalent to \$5 USD for completing the questionnaire. The survey additionally collected socioeconomic and demographic information; characteristics related to respondents' sex work and sexual risk practices; barriers to and facilitators of PrEP adherence; acceptability of CEIs as an adherence intervention; knowledge of HIV risks; and knowledge of PrEP for HIV prevention.

2.2.2 DCE sample size and population.—The minimum required sample size (N) was calculated based on the number of tasks (t), the alternatives (a) per task, and the number of analysis cells (c) as follows: $N = (500 \times c) / (t \times a)$. When considering main effects, (c) is equal to the largest number of levels for any one attribute. Solving with $t=8$, $a=3$, and $c=5$ our required sample size for the DCE was a minimum of $N=105$ respondents (28). Our final actual sample size was $N=200$ to allow exploration of heterogeneity by socioeconomic status (SES).

2.3 Model specification

The model for the present analysis can be represented by a random utility structure as follows:

$$U_{ij} = V_{ij} + \epsilon_{ij}$$

where $i = 1, \dots, 200$ represents individuals and $j = 1, 2, 3$ represents the alternatives. This same model could be accommodated to include t choice tasks ($t = 1, \dots, 8$). The random utility model assumes that an individual when faced with a choice between two or more alternatives, will choose the alternative that maximizes his utility. Additionally, the observed component (V_{ij}) can be represented as a vector of X_{ij} of explanatory variables and a vector β of coefficients associated with these variables.

The model specification also included the definition of the variable that combines the analyzed attributes. As mentioned, the study included four attributes: conditional economic incentive (\$USD 15, 30, and 45, with the reference category being none), payment type (fixed versus lottery), payment format (electronic gift card versus voucher), and test type (hair versus blood). Since the choice between attributes is interdependent, we had two alternatives. First, to include the levels of the attributes as main terms as well as the interaction terms between all these levels. Second, to combine all attribute levels in just one variable with 24 categories plus the reference category (none). Although both specifications are correct and produce the same results, we use the second to facilitate the interpretation of the results as well as the estimation of the predicted utilities for each level of each attribute.

3.4 Econometric analysis

The statistical analysis was conducted by comparing the results of three models: conditional logit model (CLM), mixed logit model (MLM), and rank-ordered logit (ROL). Specifically, the CLM and MLM were applied when we asked individuals which, of the 24 alternatives presented, they would select as their most preferred program, and ROL model was applied when we ordered responses as follows: 0 = no selection, 1 = second option, and 2 = first

option. Akaike and Bayesian information criteria (AIC and BIC) were used to determine the best model for the data.

Although the conditional logit has been the predominant model for analyzing DCE data, it tends to impose severe restrictions, mainly: (1) independence of irrelevant alternatives; and (2) error terms are independent and identically distributed across observations. Additionally, the heterogeneity between preferences cannot be adequately modeled, i.e., it is assumed that identical preferences across respondents exist. On the other hand, the MLM explicitly models the heterogeneity among respondents and relaxes the assumption of independence from irrelevant alternatives. In that vein, the MLM allows more flexibility by specifying certain coefficients to be randomly distributed across individuals. Finally, and as described in the Stata manual for the CM command set (29), estimation by maximum simulated likelihood was undertaken using the command *cmxtmixlogit*. The results are generated assuming that random parameters were normally distributed using a determined number of Halton draws (default is 250) to simulate the likelihood functions to be maximized.

Results are reported as predicted utilities for each level of each attribute obtained by the linear combination of all coefficients of these levels using the *lincom* function in Stata. We also reported the preference weights (or relative influence) according to recommended reporting practices for DCEs (30). The relative influence of each level of each attribute was calculated by dividing the parameter estimates for a given level by the sum of all parameter estimates ranges for all levels of a specific attribute. Then, the relative influence captures the proportion of the choice that were determined by the given level. Relative influence values were calculated for each of the 4 attributes considered.

2.5 Willingness to pay

We estimated the willingness to pay (WTP) in terms of the economic incentive amount attribute by calculating the marginal rate of substitution. The WTP quantified the trade-offs that participants were willing to make across attributes in terms of the amount of incentive they would be willing to forgo to keep a given attribute in the program. We also analyzed differences in WTP by participants' socioeconomic status. Following standard methodology (27), WTP was estimated as follows:

$$WTP_k = \frac{MU_k}{MU_c}$$

where MU_k and MU_c were the marginal utilities of attribute “ k ” and cost (in terms of incentives forgone), respectively.

2.6 Socioeconomic Index

To create an index of socioeconomic status (SES), we used Stata's *pca* command to apply principal component analysis (PCA) based on respondents' income level, educational attainment, and material possessions. Income level and educational attainment data were self-reported during the DCE (31). The following questions were used to determine a respondent's material possessions: *How many rooms are in your current house?*, *Is there*

a refrigerator in your home?, Is there a hot water tank in your current home?, Does your current home have a washing machine?, Is there a computer (laptop/desktop/tablet, etc.) in your current home?, Is there a TV in your current home?, Is there internet access in your current home?, Is there household help in your current home?, Does your household have a car, and, if yes, how many cars?, and How many people in your household are employed?. In order to verify the internal consistency of the index, we estimated the Cronbach's $\alpha=0.89$ for 200 participants. The first component, which defined the index, explained 50.8% of the data's observed variance. The socioeconomic index was divided into tertiles.

All analyses were conducted in Stata 16.1 using the choice models (CM) commands set (StataCorp. 2019. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC).

4. RESULTS

Table I presents the sociodemographic characteristics and sexual behaviors of the 200 survey respondents. The mean age was 28.5 (SD=6.8) and 42% of MSWs had at least a high school education. Respondents with the lowest weekly income (i.e., those in the first socioeconomic tertile) had either a primary (16%) or secondary education (43%) while respondents in the second and third socioeconomic tertiles had completed high school (48% & 52% respectively) or some college (24% & 38% respectively). The overall mean weekly income was \$157 USD (SD=\$274). However, weekly income varied greatly by economic status: \$88 USD a week for MSWs in the lowest socioeconomic tertile (SD=\$62), \$139 USD (SD=\$168) for those in the second tertile, and \$244 USD for those in the third tertile (SD=\$430). For all survey respondents, the average charge per sexual transaction was \$35 USD (SD=\$29). Stratifying by socioeconomic status, the mean charge per sexual transaction was \$23 USD (SD=\$12) for MSWs in the first tertile, \$37 USD (SD=\$29) in the second tertile and \$47 USD (SD=\$36) in the third tertile.

Male sex workers reported a mean of 3.8 clients per week (SD=3.3) with variability by socioeconomic status: 3.5 clients per week on average for MSWs in the first tertile compared to 4.2 clients per week for those in the third tertile. Most respondents self-identified as gay or homosexual (55%) or by bisexual (37%). The majority (87%) of MSWs reported always using a condom during commercial sex transactions, with little variation by economic status. In general, most MSWs (95%) report to have a daily routines and habits that could be good remainders for pill taking. Also, 18% of those surveyed in the third tertile of socioeconomic level answered that they would be afraid to be seen taking a daily pill (because people may think they have HIV), while that proportion is slightly lower in the others tertiles.

MLM results are presented in Table II. The data shows that probability of choosing an intervention program increases as the incentive amount increases. Specifically, the coefficient related to a CEI of \$45 was higher ($\beta=25.1$, CI 95%: 22.8–27.5, p-value<0.01) in comparison with \$30 and \$15 amounts ($\beta=19.9$, CI 95%: 17.6–22.2, p-value<0.01, and $\beta=14.9$, CI 95%: 12.6–17.2, p-value<0.01, respectively). Regarding payment type, the data showed respondents' preference for the fixed payment ($\beta=5.5$, CI 95%: 3.2–7.7, p-value<0.01). Also, hair testing would be more acceptable than a blood draw for adherence

monitoring ($\beta=1.7$, CI 95%: 0.1–3.4, p -value=0.04). There were no significant differences regarding the payment format, either e-gift card or voucher ($\beta=0.8$, CI 95%: –0.9;3.4, p -value=0.35).

The results of the comparison between the proposed models (CLM, MLM, ROL) are found in Table A2 of Annex 3 of the Supplemental Material. According to the values of the Akaike and Bayesian information criteria, the MLM, presented above, was deemed the most appropriate.

Figure 1 reports the relative influences of the four attributes. The higher CEI amount, the higher impact on the decision making about participate in the prevention program. Similarly, a fixed payment and hair testing has a greater impact than lottery and blood draw. The payment format (voucher vs. electronic gift card) has no impact on the decision making.

Table III shows the willingness-to-pay estimates for the most preferred program attributes stratified by socioeconomic status. In general, for all, MSWs were willing to forego \$9.42 USD to receive conditional economic incentives as a fixed payment instead of as a lottery, and \$2.52 USD for hair-based testing instead of blood draw. The payment format (voucher vs. electronic gift card) did not show significant differences. Similar pattern was observed for all tertiles. Although the respondents of lower socioeconomic status seem to be more willing to forego more of their incentive to ensure a fixed CEI amount, this trend was not statistically significant. Similarly, there were no statistically significant differences by SES for the preference between hair testing and blood draw.

5. DISCUSSION

This discrete choice experiment demonstrates that male sex workers are highly willing to accept conditional economic incentives as a tool for improving their use of HIV prevention services and PrEP adherence. The optimal design of a CEI-based intervention to maximize participants' utility and potentially improve PrEP adherence among MSWs would provide a (comparatively) high incentive amount and would be offered as a fixed amount rather than as a lottery; hair samples would be more acceptable than blood draws for adherence monitoring; and incentives would be offered either as electronic gift card or as a voucher (for food and groceries). Participants would be willing to give up some of their incentive to get a fixed amount.

MSWs are willing to forego nearly \$10 USD to ensure that they receive CEIs as a fixed payment rather than a lottery, which is almost 21% of the maximum incentive they could potentially receive for perfect PrEP adherence. We did not find that individuals of lower socioeconomic status are willing to pay more to ensure a fixed payment. Even so, MSWs' strong preference for fixed incentives reflects the immediate economic need of this vulnerable population, who live hand-to-mouth and cannot afford to risk losing any potential income via a lottery. In contrast to MSWs' preference for fixed incentives, a discrete choice experiment among young people living with HIV (YPLH) in South Africa found that youth preferred to receive lottery incentives as part of an ART adherence program (32), which may reflect the propensity of youth for higher risk taking (33). The risk of HIV acquisition

among sex workers (34), and MSWs in particular (18), is tied to the additional premium that sex workers receive for condomless sex with a client. Any PrEP adherence program for male sex workers will need to offer CEI amounts that are high enough to promote continued use of antiretroviral-based prevention yet simultaneously continue to promote high condom use for protection against other STIs, yet small enough so as to preserve behavioral autonomy (35). CEIs for PrEP adherence will need to be adjusted to the specific needs of MSWs in order to optimize their effectiveness in HIV prevention. Given the vulnerability of the population, and equity considerations to be prioritized, an ideal future program should consider some portion of the incentive amount be fixed; for example, a minimum fixed incentive warranted to cover transportation and incidental costs.

Our results also demonstrated that MSWs preferred hair collection versus blood collection for analyzing PrEP adherence. PrEP drugs can be measured in small hair samples as an objective metric of adherence. Increasingly, objective metrics have been incorporated into PrEP adherence interventions to overcome some of the limitations of self-reported adherence, such as recall and social desirability bias (36). Hair collection is noninvasive and requires only 1.5 cm of hair to be cut from the back of the head, which may have led to MSWs' preference for hair analysis over phlebotomy for blood testing (37).

4.1 Strengths and limitations

To our knowledge, this research represents the first DCE performed among MSWs and provides novel evidence of MSWs' preferred attributes of a PrEP adherence intervention. PrEP interventions for MSM have been widely explored in recent studies (38–40); however, there is a lack of information with respect to how to adapt PrEP interventions to meet the specific needs of MSWs. Our DCE study allowed us to analyze characteristics and attributes of the PrEP intervention package that maximizes individual preferences (41,42). The DCE allowed us to define a set of choices for potential users based on preliminary explorations about their preferences and their context; and then, provide clarity and rigor in the definition of characteristics and attributes of the interventions in the pursuit of further generalizability (43).

One important limitation of this study is the fact that discrete choice experiments explore individual's preferences presenting hypothetical situations that may not necessarily predict real-life behaviors or final choices. In this area, there is a growing literature to analyze differences between stated and revealed preferences (44). Additionally, the construction of several hypothetical situations could lead to potential cognitive overload (45), or confusion at the moment of expressing preferences under a situation in which pros and cons are assessed.

6. CONCLUSION

Sexual risk taking among male sex workers is linked to economic need. Higher, fixed conditional economic incentives provide the maximum utility for MSWs eligible for a PrEP adherence intervention. Offering fixed payments as part of a quarterly adherence program can help to meet the immediate daily needs of male sex workers, especially for MSWs of lower socioeconomic status. Defining a conditional economic incentives intervention

tailored to MSWs' needs and preferences could help to improve the effectiveness of a PrEP intervention in regions of concentrated HIV epidemics.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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KEY POINTS

- The application of a discrete choice experiment allowed us to identify the most preferred characteristics and attributes of a PrEP intervention which taken together maximizes male sex workers preferences: the optimum amount of incentives, the type of incentive (fixed vs. lottery), the mechanism to deliver the incentive as well as the most preferred laboratory testing alternative to monitor adherence to PrEP.
- The optimal design of a CEI-based intervention to maximize participants' preferences and potentially improve PrEP adherence among MSWs would include: (1) higher incentive amounts, (2) fixed payment rather than lottery, and (3) hair samples as PrEP adherence monitoring rather than blood samples.
- Male sex workers' strong preference for fixed incentives reflects the immediate economic need of this vulnerable population, who live hand-to-mouth and cannot afford to risk losing any potential income via a lottery.
- Sexual risk taking among male sex workers is linked to economic need. Offering higher fixed payments as part of a quarterly adherence program can help to meet the immediate daily needs of male sex workers, especially for MSWs of lower socioeconomic status.

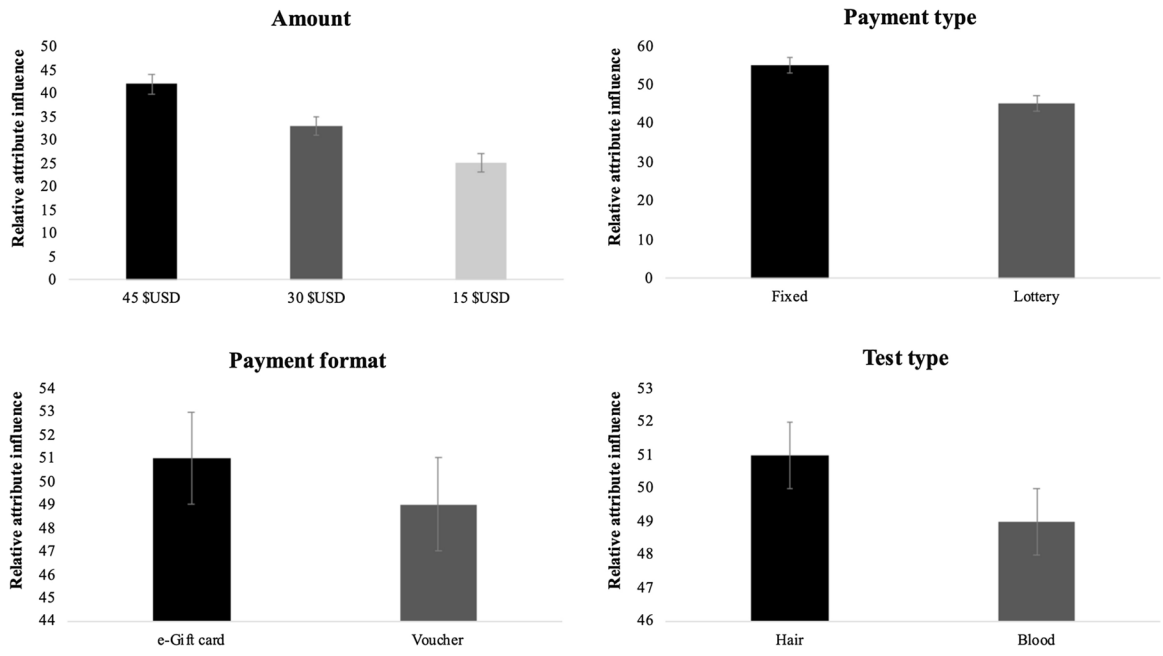


Figure 1.
Relative attribute influence for the Discrete Choice Experiment

Table 1.

Respondent characteristics by socioeconomic status

	All (n=200)			1st tertile (n=67)			2nd tertile (n=67)			3rd tertile (n=66)			Statistical test (t or chi-square) ^b	p-value
	Mean ^a	Sd.		Mean	Sd.		Mean	Sd.		Mean	Sd.			
Sociodemographic characteristics														
Age	28.5	6.8		27.9	7.3		28.5	6.8		29.3	6.4		1.11	0.26
Weekly income ^c	\$157	\$274		\$88	\$62		\$139	\$168		\$244	\$430		3.72	<0.01
Price charged per sexual transaction ^c	\$35	\$29		\$23	\$12		\$37	\$29		\$47	\$36		4.90	<0.01
Highest level of education completed														
Primary	0.08			0.16			0.04			0.02				
Secondary	0.25			0.43			0.22			0.09				
High school	0.42			0.27			0.48			0.52			42.48	<0.01
College / University	0.25			0.13			0.24			0.38				
Sexual behaviors														
Number of sex clients per week	3.8	3.3		3.5	2.2		3.6	2.7		4.2	4.5		1.2	0.215
Sexual identity														
Heterosexual	0.09			0.09			0.09			0.08				
Gay/Homosexual	0.55			0.46			0.54			0.64			4.24	0.373
Bisexual	0.37			0.45			0.37			0.29				
Use of condom ^d														
Never condom use	0.05			0.09			0.04			0.02				
Low condom use ^e	0.03			0.03			0.01			0.03			7.67	0.263
Medium condom use ^f	0.06			0.07			0.07			0.02				
Always condom use	0.87			0.81			0.87			0.94				
Barriers and facilitators														
Daily routines and habits	0.95			0.95			0.95			0.93			0.23	0.89
Adherence support	0.69			0.70			0.71			0.66			0.40	0.81
Fear of being seen taking a daily pill	0.17			0.16			0.16			0.18			0.09	0.95

	Socioeconomic status						p-value			
	All (n=200)		1st tertile (n=67)		2nd tertile (n=67)			3rd tertile (n=66)		
	Mean ^a	Sd.	Mean	Sd.	Mean	Sd.		Mean	Sd.	
Stopping taking the pill due to nausea	0.82		0.76		0.86		0.84		2.90	0.23

Notes:

^aThe cells are means and standard deviations (sd.) or proportions.

^bt-test for continuous variables and chi-square for categorical variables

^cMonetary values are expressed in USD\$; they were converted from Mexican pesos at an annual average exchange rate of \$1USD=19.11 Mexican pesos (Banxico, 2019).

^dThe variable condom use was constructed based on information related to an individual's three most recent sexual encounters. Never meaning condoms were not used in any of the last three encounters, and always meaning that condoms were used in all three of the last three encounters.

^eLow condom use refers to using a condom in only one of the last three encounters.

^fMid-level condom use indicates that an individual used a condom in 2 of the last three encounters.

Table II.

Results of the mixed logit model (MLM)

	Utility	CI	95%	Statistical test (z)	p-value
Incentive amount (\$USD)					
<i>Reference: none</i>					
\$15 ^a	14.9	12.6	17.2	20.8	<0.01
\$30	19.9	17.6	22.2	19.9	<0.01
\$45	25.1	22.8	27.5	14.9	<0.01
Payment type					
<i>Reference: lottery</i>					
Fixed	5.5	3.2	7.7	4.8	<0.01
Payment format					
<i>Reference: e-Gift card</i>					
Voucher	0.8	-0.9	2.5	0.4	0.35
Test type					
<i>Reference: Blood</i>					
Hair	1.7	0.1	3.4	2.0	0.04

Notes:

^aMonetary values are expressed in USD\$; they were converted from Mexican pesos at an annual average exchange rate of \$1USD=19.11 Mexican pesos (Banxico, 2019).

Table III.

Willingness-to-pay (WTP) estimates by socioeconomic status

	Socioeconomic status			
	Total (n=200)	1st tertile (n=67)	2nd tertile (n=67)	3rd tertile (n=66)
ATTRIBUTES				
Fixed Payment	-\$9.42 [-12.46;-6.39]	-\$10.10 [-14.33;-5.88]	-\$9.52 [-14.97;-4.08]	-\$8.16 [-14.37;-1.94]
Voucher	-\$0.99 [-3.23;1.24]	\$0.97 [-2.14;4.08]	-\$4.84 [-8.52;-0.44]	-\$0.02 [-4.68;4.63]
Blood draw	-\$2.52 [-4.79;-0.25]	-\$1.05 [-4.20;2.09]	-\$4.86 [-8.93;-0.80]	-\$1.36 [-6.06;3.32]

Notes:

^aWTP estimates represent coefficient ratios from the mixed logit models, with 95% confidence intervals in square brackets [].

^bWTP= marginal utilities of attribute / cost of attribute

^cWTP estimates were converted from Mexican pesos to USD\$ using the 2019 exchange rate from Banco de Mexico: <https://www.banxico.org.mx/tipcamb/main.do?page=tip&idioma=sp>.