Over-the-counter oral contraceptive use among women in Mexico: results from a national survey

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Received 15 July 2020
Revised 17 December 2020
Accepted 19 December 2020

To cite: Grindlay K, Wollum A, Karver J, *et al*. *BMJ Sex Reprod Health* Published Online First: [please include Day Month Year]. doi:10.1136/bmjsrh-2020-200778

ABSTRACT

Aim In Mexico, many pharmacies sell oral contraceptives (OCs) over the counter (OTC); however, little is known about the background characteristics of OTC pill users. The primary objective of this study was to understand the characteristics of OTC OC users in Mexico, including whether there were differences by age, urbanicity, and insurance status. This information is instructive as other countries explore allowing OTC access to OCs.

Methods We analysed the nationally representative 2014 Mexican National Survey of Demographic Dynamics (ENADID) among a sample of OC users aged 15–54 years (n=1970). We performed multivariable logistic models to understand the characteristics associated with OTC access, with age, urbanicity, and insurance status as our primary predictors of interest. Additionally, we descriptively explored knowledge of how frequently to take OCs by pill source and age.

Results Some 54% of pill users, including 66% of those aged 15–17 years, obtained their OCs OTC. In multivariable regression we found no differences in OTC access by age. However, being uninsured (adjusted odds ratio (AOR) 1.86, 95% CI 1.23 to 2.82) (compared with employer-based public insurance) and living in an urban area (AOR 4.73, 95% CI 3.37 to 6.66) (compared with rural area) were associated with a higher odds of OTC access among pill users. Women's knowledge of how frequently to take OCs was similar between OTC and prescription users within age groups.

Conclusions These findings point to the importance of OTC availability of OCs for pill users of all ages and uninsured and urban women in Mexico in particular.

Key messages

- The majority of oral contraceptive (OC) users in Mexico obtained the method from pharmacies over the counter (OTC).
- Factors associated with OTC OC use in Mexico included being uninsured and living in an urban area.
- Knowledge about appropriate use of OCs was similar between those who obtained the method by prescription and OTC.

INTRODUCTION

Oral contraceptive (OC) pills are available over the counter (OTC) in more than 100 countries.[1] Studies have shown that women can accurately self-identify contraindications to pill use with simple checklists.[2 3] Effectiveness of OTC use appears to be at least as good as clinic-based provision, with one study demonstrating improved method continuation with nonprescription access.[4]

In the United States, there is interest in and support for OTC pill availability among potential users,[5–7] people from a range of backgrounds and political affiliations,[8 9] and professional medical and nursing organisations.[10–13] As the United States and other countries explore the possibility of allowing OTC access to OCs, they will have to determine whether the service delivery model is appropriate for women of all ages. It is therefore instructive to learn from contexts where adolescents already have access to OTC OCs.

In Mexico, the pill is technically available by prescription only but frequently sold OTC in pharmacies for around $5 per cycle.[1 14] Research has shown young people face barriers to contraceptive access in Mexico City.[15] A 1999 study of 4300 young people aged 13–19 years across Mexico showed that pharmacies

were an important source of contraception, with 86% of sexually active adolescents obtaining a contraceptive method from a pharmacy the first time they had sex. While most obtained condoms, a small percentage obtained OCs.[16] Little is known about the background characteristics of OTC OC users in Mexico, including the extent to which young women obtain the pill without a prescription. The primary objective of this study was to understand the characteristics of OTC OC users in Mexico, including whether there were differences in OTC use by age, urbanicity, and insurance status.

METHODS

The data for this study come from the 2014 National Survey of Demographic Dynamics (known by its Spanish acronym ENADID), a nationally representative survey in Mexico that aims to capture demographic trends related to fertility, mortality, and migration. The sample design for the ENADID surveys involved a two-stage probabilistic sampling technique, accounting for stratification and clustering consistent with the Mexican Census mapping. Final selection was at the household level, and units of observation were the individuals that compose them.[17 18]

The survey included questions for women aged 15–54 years about their current contraception use and contraceptive source. Survey participants who reported current OC use were asked: "Where did you get the method when you started using it?". Response options included various public and private clinics and hospitals and a "pharmacy or other self-service store". We categorised women as obtaining the pill OTC if they reported first getting OCs from a "pharmacy or other self-service store". Prior research using data from nationally representative surveys in Mexico has taken a similar approach to identifying respondents obtaining OCs OTC.[19]

A wealth index was constructed for the full survey sample of women aged 15–54 years using principal component analysis with household asset indicator variables. The predicted score from the first (unrotated) component was divided into quintiles (with one representing the lowest and five the highest). We grouped marital status into "unmarried/not cohabitating", which included those who reported being single, widowed, divorced, separated, or separated from a person with whom they had previously cohabitated; and "married/cohabitating", which included those two categories. We grouped insurance status into private insurance; employer-based public insurance (IMSS (government insurance for private sector employees), ISSSTE (government insurance for federal employees), IMSS Oportunidades/IMSS Prospera (a conditional cash transfer and health insurance programme for low-income, non-formal sector workers with children), and other employer-based public insurance types); universal (Seguro Popular) insurance (government insurance for those without employer-based insurance); and none. Where multiple insurance types were reported, insurance status was coded in this order: private insurance, employer-based public insurance, and Seguro Popular.

A binary indicator of correct knowledge of how often to take OCs was constructed using a question asking women how often one should take an OC. Respondents who answered once daily ("una diaria") were considered to have correct knowledge while all other answers were considered incorrect.

Data analyses were performed using Stata Statistical Software version 12.0 (StataCorp, College Station, TX, USA) and R version 3.3.1 (R Core Team, Vienna, Austria). All estimations accounted for survey design and individual level frequency weights to give nationally representative estimates.

We performed descriptive statistics of individual and household-level background characteristics among current OC users overall and by current OTC OC use, and constructed multivariable logistic models to assess whether age, urbanicity, or insurance status were related to accessing an OTC OC. We selected these three variables for multivariable regression because we hypothesised them to have a direct impact on OTC OC use with potential policy and practice implications. We hypothesised young people may prefer OTC access due to privacy concerns; that women in urban areas may have greater access to pharmacies compared with their rural counterparts; and that uninsured women may have a particular need for OTC access. We constructed directed acyclic graphs (DAGs) to identify potential confounding factors for each predictor of interest (age, urbanicity, and insurance status) to avoid bias in assessing their total effects. DAGs allow the researcher to capture the dependence structure of multiple variables and their relationships to the key predictor and outcome of interest, and to identify a set of variables for which to adjust in multivariable models that allows for the least biased estimate of the effect of the predictor on the outcome.[20 21] All individual and household characteristic variables from table 1 were candidates for inclusion in the DAGs and were retained based on previous literature and hypothesised relationships with our predictors of interest and outcome of OTC OC use; unobserved variables were included in the DAGs to represent the hypothesised pathway where relevant. For our multivariable models, we included the minimal sufficient adjustment set of variables for estimating the total effect of our predictors of interest on OTC OC use. We used DAGitty (web application) to represent our DAGs and identify the set of variables to control for in our analyses.[22] While we hypothesised many mediating paths from age to OC source, there was no potential confounder in the relationship between age and source of OC, so we ran an unadjusted model. For urbanicity, we controlled for age, indigenous identity, and region of the country. For insurance status,

Table 1 Participant characteristics of current oral contraceptive users, and by oral contraceptive users obtaining the method over the counter, among women aged 15–54 years in Mexico in 2014 (n=1970)

Characteristic	All OC users (n, weighted %)	OC users obtaining the method OTC (n, weighted %)
All women	1970, 100%	993, 54.1%
Age (years)		
15–17	37, 1.7%	23, 65.5%
18–24	389, 20.1%	199, 51.6%
25–34	885, 44.0%	451, 56.1%
35–44	530, 27.1%	261, 53.8%
45–54	129, 7.1%	59, 47.4%
Indigenous identity		
Yes	69, 2.6%	24, 38.0%
No	1901, 97.4%	969, 54.6%
Household wealth index		
First quintile of wealth distribution	205, 8.7%	53, 28.7%
Second quintile of wealth distribution	326, 14.3%	126, 43.5%
Third quintile of wealth distribution	444, 22.0%	201, 45.0%
Fourth quintile of wealth distribution	452, 22.7%	253, 57.4%
Fifth quintile of wealth distribution	543, 32.2%	360, 69.7%
Urbanicity		
Urban locality (>2500 inhabitants)	1618, 85.4%	904, 59.0%
Rural locality (≤2500 inhabitants)	352, 14.6%	89, 25.8%
Region		
North region	1088, 43.9%	541, 52.1%
Central region	561, 42.4%	301, 59.0%
South region	321, 13.7%	151, 45.9%
Lives in Federal District		
Yes	101, 11.1%	74, 74.1%
No	1869, 88.9%	919, 51.7%
Marital status		
Unmarried/not cohabitating	398, 22.2%	235, 60.7%
Married/cohabitating	1572, 77.8%	758, 52.3%
Participant is head of household		
Yes	245, 11.9%	132, 54.3%
No	1725, 88.1%	861, 54.1%
Head of household sex		
Male	1545, 77.4%	766, 53.8%
Female	425, 22.6%	227, 55.3%
Highest level education completed		
No schooling or some primary	97, 4.5%	24, 25.7%
Primary	244, 11.7%	98, 43.1%
Secondary	614, 29.3%	257, 45.0%
High school	337, 17.1%	188, 57.1%
Tertiary education	676, 37.3%	425, 66.9%
Current school enrollment		
In school	167, 8.6%	108, 67.0%
Not in school	1803, 91.4%	885, 52.9%
Current work status		
Working	1110, 58.9%	616, 59.4%
Not working	860, 41.1%	377, 46.6%
Insurance		
Private insurance	111, 7.3%	75, 74.9%
Employer-based public insurance	968, 47.6%	484, 54.5%
Universal (Seguro Popular) insurance	566, 26.3%	222, 40.0%
None	325, 18.8%	212, 65.1%
Ever been pregnant		
Yes	1567, 76.4%	738, 50.1%
No	403, 23.6%	225, 67.3%
Sexual activity in the past month		
Yes	275, 13.2%	113, 50.0%
No	1695, 86.8%	860, 54.8%

OC, oral contraceptive; OTC, over the counter.

we controlled for employment status, marital status, and wealth index. We performed collinearity diagnostics and Hosmer–Lemeshow goodness-of-fit tests for each regression to test model calibration. We tested including the wealth index as a categorical variable representing wealth quintiles, as a linear variable, and using a quadratic term. We ultimately retained the quintiles in our final model based on the model log likelihoods.

We also performed a descriptive analysis of knowledge of how often to take OCs among current pill users by pill source (prescription vs OTC) and age group. We tested the bivariate association between age, source of OC, and the interaction of these variables using logistic models. We do not present the odds ratios (ORs) for these analyses given the small sample size and instead rely on them to test statistical significance of the associations between age, pill source, and knowledge about use of OCs.

The data for this study were publicly available and de-identified, so we did not obtain institutional review board approval.

Patient and public involvement

This analysis grew out of discussions of the Oral Contraceptives Over-the-Counter Working Group,[23] which includes women's health and reproductive justice organisations, including advocacy organisations that represent young people. The working group identified a need for more research on use of OTC contraceptives among young people, and a preliminary version of this analysis was presented at a Working Group meeting, where advocates gave input on the interpretation of the results.

RESULTS

Sample characteristics

Participant characteristics are reported in table 1. Overall, 98 711 women aged 15–54 years completed the survey, and 1970 reported current use of an OC and were included in our analysis. The response rate overall was 90.8% of dwellings surveyed.[18] Among our sample of OC users, approximately 2% were aged 15–17 years, 3% identified as indigenous, and more than four-fifths lived in an urban locality. More than 40% of participants lived in each of the North and Central regions. More than three-quarters were married or cohabitating and 12% were the head of their household. Ninety-five percent had completed primary education or higher and more than half were currently working. The largest proportion of women (48%) had employer-based public health insurance and 19% were uninsured. Seventy-six percent had ever been pregnant, and 13% reported being sexually active in the past month.

Table 2 Multivariable regression results examining the relationship between age, urbanicity, and insurance type on over-the-counter oral contraceptive use

Characteristic	Model 1: Age OR (95% CI)	Model 2: Urbanicity OR (95% CI)	Model 3: Insurance OR (95% CI)
Age (years)			
15–17	Reference		
18–24	0.63 (0.26–1.53)		
25–34	0.80 (0.34–1.89)		
35–44	0.72 (0.30–1.73)		
45–54	0.70 (0.26–1.85)		
Urbanicity			
Urban		4.73 (3.37–6.66)	
Rural		Reference	
Insurance			
Private insurance			1.70 (0.93–3.10)
Employer-based public insurance			Reference
Universal (Seguro Popular) insurance			0.92 (0.68–1.24)
None			1.86 (1.23–2.82)

Model 1 was not adjusted by any covariates; Model 2 controlled for region, indigenous identity, and age category; and Model 3 controlled for marital status, wealth quintiles (categorical), and employment status. All models included 1760 observations. Model 2 and Model 3 had significant F tests ($p<0.001$) while Model 1 was not significantly better than the null model ($p=0.60$).
CI, confidence interval; OR, odds ratio.

OTC OC use

Overall, the majority of OC users (54%) obtained the method OTC, including 66% of women aged 15–17 years. Lower proportions of women who identified as indigenous (38%); were in the first through third wealth quintiles (29%–45%); lived in rural localities (26%) or in the South region (46%); had less than secondary education (26%–43%); and had universal (Seguro Popular) health insurance (40%) reported OTC OC use (table 1).

In the analysis exploring the relationship between age and OTC OC use among current pill users, age was not associated with OTC OC use (table 2). In the multivariable analysis exploring the relationship between urbanicity and OTC OC use among current pill users, women living in urban areas had a greater odds of OTC OC use compared with their rural counterparts (adjusted odds ratio (AOR) 4.73, 95% CI 3.37 to 6.66). In the multivariable analysis exploring the relationship between insurance status and OTC OC use among current pill users, women who were uninsured (AOR 1.86, 95% CI 1.23 to 2.82) had greater odds of OTC OC use compared with women with employer-based public insurance; there were no differences between women with employer-based public insurance and private insurance or universal (Seguro Popular) insurance.

Knowledge of OC use

Among current OC users, there were no significant differences in correct knowledge of how often to take OCs by oral contraception source. Among all OC users, knowledge was higher among those aged 18 years and over ($p<0.001$), not taking into account source of OC. Comparing knowledge within age groups by source of OC, we identified no significant difference in levels of knowledge. Moreover, considering the interaction between source of OC and age groups in our analysis, our results no longer detected significant differences between age groups in overall levels of knowledge within groups that accessed OCs from the same

Table 3 Correct knowledge of how often to take oral contraceptives among current oral contraceptive users, by oral contraceptive source, among women aged 15–54 years in Mexico in 2014 (n=1970)

OC source	Age group (years)				
	15–17 (n=37)	18–24 (n=389)	25–34 (n=885)	35–44 (n=530)	45–54 (n=129)
Prescription	78.0% (29.1%–96.8%)	90.3% (83.1%–94.7%)	97.1% (94.8%–98.4%)	92.7% (86.8%–96.1%)	94.8% (77.7%–99.0%)
OTC	89.2% (61.9%–97.7%)	91.4% (86.5%–94.7%)	95.6% (93.0%–97.2%)	96.3% (93.1%–98.1%)	96.8% (89.6%–99.1%)

Respondents who answered "once daily" ("una diaria") were considered to have correct knowledge while all other answers were considered incorrect.
OC, oral contraceptive; OTC, over the counter.

source. More than three-quarters (78%, 95% CI 29% to 97%) of 15–17-year-olds who got their OC from a prescription source correctly answered how often to take the pill compared with 89% (95% CI 62% to 98%) of OTC users; however, the confidence intervals overlap and are large given the small sample. Among women aged 18–24, 25–34, 35–44, and 45–54 years, over 90% of both prescription users and OC users had correct knowledge of how often to take OCs (table 3).

DISCUSSION

OTC access was an important pill source for women of all ages and we did not find differences in OTC OC use by age. Determinants of OTC OC use included living in an urban area and being uninsured. Women's knowledge of how frequently to take OCs was similar between OTC and prescription users within age groups.

The finding among uninsured women mirrors the situation in the United States where uninsured women are 30% less likely to report using a prescription contraceptive method than insured women.[24] Other research from the United States shows interest in an OTC OC is higher among uninsured women compared with those with public insurance.[5] This suggests that OTC contraceptive options provide an important source of contraception for those without insurance coverage.

OTC use of OCs in Mexico among women may also be driven in part by access. Urban areas in Mexico tend to have more pharmacies than rural areas, possibly explaining the higher odds of OTC use among urban residents. Although not statistically significant, the higher proportion of OTC OC use among teens may reflect the importance of easier access for this population, although at a potentially higher out-of-pocket cost.[25] In the United States, teens are more likely to use OTC methods like condoms than any other type of contraceptive method.[26]

Our findings also suggest that regardless of pill source and age group, women had high levels of understanding of how often to take the pill. Among current OC users, overall knowledge of how often to take OCs was high (>75% among all age groups) and did not differ by source of OC. Our findings are supported by prior research indicating clinicians do not necessarily counsel on birth control methods during visits in Mexico,[27] and that source of OCs does not affect continuation.[28] Similar evidence in the United States has not demonstrated that counselling on birth control improves adherence or continuation,[4 29] and there are many challenges to effective counselling in clinic-based settings.[30] Future work could identify other dimensions along which knowledge about OCs differ and to what extent previous sources of OCs may play a role in knowledge.

This analysis has several limitations. This survey was cross-sectional in nature and participants may have had recall bias around their original OC source. The small sample of OC users aged 15–17 years also limits our power to draw conclusions about minors specifically. Additionally, the survey did not ask a detailed set of questions needed to fully assess correct knowledge of how to take OCs but instead one proxy question about taking one pill daily. We did not include in the analysis a survey question about what to do in the case of missed pills because the response options were not consistent with current guidance. Despite these limitations, this analysis was able to systematically analyse individual and household characteristics that were associated with OTC OC use in Mexico, and to explore knowledge of pill use by pill source and age. An additional strength of this study is that it utilises a nationally representative dataset.

Our analyses demonstrate that pharmacies are a frequent source of OCs in Mexico for people of all ages. Among OC users, correct knowledge of how often to take the pill was high and did not differ by source within age group. These results suggest that OTC OC access fills a gap for uninsured women in Mexico, and may provide a convenient supply source for women in urban areas.

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Acknowledgements The authors thank The David and Lucile Packard Foundation for its support of this research.

Contributors All authors contributed to the planning of the study. AW and JK coded and analysed the data. KG and AW drafted the manuscript. All authors contributed to the review and revising of the manuscript.

Funding This study was funded by a grant from The David and Lucile Packard Foundation.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. The data for this analysis are available here: http://en.www.inegi.org.mx/programas/enadid/2014/.

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