**Table A.2. Expanded evidence summary for studies on pharmacist-prescribed contraception: pharmacist perspectives (10 studies)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author, year, funding** | **Study design** | **Population** | **Law or policy** | **Outcomes** | **Results** | **Strengths** | **Weaknesses** | **Quality** |
| Rodriguez, 2016, Women’s Reproductive Health Research Fellow | Cross-sectional electronic survey | 509/3041 (17%) pharmacists, Oregon | Pharmacist-prescribed contraception, after passage but prior to implementation of Oregon law | Interest  Motivators  Comfort  Barriers | Interest in providing services:  Prescribing contraception (57%)  Managing side effects (61%)  Switching methods (54%)  Interest in expanding to other methods:  Injectables (36%)  Implants (14%)  Intention to prescribe (39%)  Factors associated with intention:  Currently providing EC vs. not: OR= 2.2; 95% CI 1.5-3.4 Rural vs. urban: OR=0.6; 95% CI 0.4-0.9  Factors not associated:  Years in practice, age, gender  Motivators for prescribing:  Reduce unintended pregnancies (66%)  Increase access (61%)  Strengthen collaboration within healthcare team (~47%)  Increase job satisfaction (~35%)  Comfort- Desire additional training on:  Contraceptive information (61%)  Identifying contraindications (72%)  Contraceptive counseling (66%)  Barriers to prescribing:  Staff shortage (~75%)  Liability (~75%)  Need for training (~70%)  Corporate policies (~57%)  Costs (~55%)  Lack of privacy (~55%)  Resistance from physicians (~32%)  Religious objections (~15%)  Resistance from public (~12%) | Sampled all pharmacists practicing in Oregon  Appropriate descriptive and analytic technique (logistic regression) | 17% response rate; no comparison of non-respondents and respondents  7-18% missing for demographic variables; missing not reported for most outcome variables  Reliability and validity of survey constructs not established  Survey questions based on literature review and previous similar surveys; no explanation of piloting or testing  Likely not generalizable to target population due to low response rate | Bias  Selection bias:  High  Information bias:  High  Analysis bias:  Low  Generalizability  Poor |
| Lio, 2018, funding not reported | Pre-post electronic survey, evaluating 1-hour training session for pharmacist-prescribed contraception | 78/350 (22%) pharmacists, mid-Atlantic division of Kroger pharmacies (includes parts of Kentucky, North Carolina, Ohio, Tennessee, Virginia, West Virginia) | Pharmacist-prescribed contraception, not implemented in sampled states | Comfort  Barriers | Comfort prescribing HC methods\*:  OC: pre (54%); post (64%)  Transdermal: pre (36%); post (55%)  Intravaginal: pre (36%); post (47%)  Injection: pre (27%); post (43%)  Comfort prescribing HC, pre-training:  With protocol (46%)  Under CPA (65%)  When to refer to physician (63%)\*  Comfort incorporating pharmacist-prescribed HC into workflow:  Pre-training (35%)  Post-training (~41%)  Comfort- Most important resource for prescribing:  Pharmacist training session (43%)  Private counseling room (21%)  Pharmacist overlap (20%)  Extra staff technicians (5%)  Extra documentation time (5%)  Reference materials (3%)  Billing resources (2%)  Extra technician training (<1%)  Most important barrier:  Liability (32%)  Workflow disturbances (27%)  Gaps in contraceptive knowledge (24%)  “Not wanting women to neglect other women’s health care aspects” (17%)  Barriers (free text option):  Lack of time, lack of access to patient medical records, and lack of reimbursement for services  \*significant increase from pre-training to post-training | Appropriate descriptive and analytic technique (Wilcoxon signed rank test to compare pre- and post-survey results) | Convenience sample of all 350 pharmacists from 118 Kroger pharmacies  22% response rate; no comparison of non-respondents and respondents; only included pharmacists who responded to both pre- and post- survey in analysis, no explanation of rate of attrition  0% missing for demographic variables (except >80% missing for credentials); missing not reported for most outcome variables, but 0% missing for comfort by HC method outcome  Reliability and validity of survey constructs not established  Survey questions based on literature review; no explanation of piloting or testing  Likely not generalizable to target population due to low response rate | Bias  Selection bias:  High  Information bias:  High  Analysis bias:  Low  Generalizability  Poor |
| Hilverding, 2017, funding not reported | Cross-sectional electronic survey | 138/500 (28%) pharmacists, Ohio direct patient care pharmacy settings | Pharmacist-prescribed contraception, not implemented in Ohio | Interest (support)  Motivators  Comfort  Barriers | Support for pharmacy access to OCs under CPA or statewide protocol (57%)  Support for pharmacy access to patch under CPA or statewide protocol (54%)  Support for pharmacy access ring under CPA or statewide protocol (44%)  Support for pharmacy access to injectables under CPA or statewide protocol (37%)  Factors associated with support for pharmacy access:  PharmD vs. BSPh (p=0.04)  <10 years experience vs. >=10 years experience (p=0.02)  Benefits to pharmacist-initiated HC:  Increased access (62%)  Convenience (59%)  Reduce unintended pregnancy (46%)  Increase continuation/compliance (39%)  Increase use of HCs (28%)  Comfort- Believe that pharmacists are prepared to initiate HC (50%)  Factors associated with positive belief:  PharmD vs. BSPh (p=0.003)  < vs. <10 years experience (p=0.02)  Comfort- Desire to learn more about:  Product selection (93%)  Product switching (85%)  When to refer to physician (85%)  Comfort- Tools needed to prescribe:  Clinical guidelines (72%)  Continuing pharmacy education (65%)  Patient education materials (63%)  Patient medical records (59%)  Risk assessment questionnaire (57%)  Procedural algorithm (55%)  Barriers to pharmacist-initiated HC:  Time constraints (49%)  Liability and responsibility (45%)  Physician resistance (44%)  Lack of patient medical records (42%)  Patients may not seek other health services (41%)  Lack of private counseling area (31%)  Inadequate compensation (30%)  Corporate policy (17%) | Random sample of all Ohio pharmacists who practice in a direct patient care setting  Respondents were generally representative of the study sample, though females were more likely than males to complete survey  Survey was pilot tested for face validity and functionality  Appropriate descriptive and analytic technique (Fisher exact nonparametric test to identify differences between non-respondents and respondents) | 28% response rate  0-1% missing for demographic variables; missing not reported for outcome variables  Reliability and validity of survey constructs not established  May be generalizable to target population as respondents were representative of the study sample, though low response rate | Bias  Selection bias:  Moderate  Information bias:  High  Analysis bias:  Low  Generalizability  Poor |
| Lynch, 2018, funding not reported | Post-intervention cross-sectional electronic survey | 9/11 (82%) student pharmacists from a women’s health elective at a pharmacy school, Illinois | Pharmacist-prescribed contraception, not implemented in Illinois | Comfort | Comfort- Post-simulation attitudes toward prescribing HC:  Confidence in prescribing (89%)  Comfort knowing when to refer to physician (89%) | 82% response rate, though no comparison of non-respondents and respondents  All respondents answered all questions  Appropriate descriptive analysis | Sampled students from one elective class at one pharmacy school; no report of student demographics  Reliability and validity of survey constructs not established  No explanation of piloting or testing  Not generalizable to target population due to sampling frame | Bias  Selection bias:  High  Information bias:  High  Analysis bias:  Low  Generalizability  Poor |
| Rafie, 2011 and Rafie, 2014, Vincent Isnardi Opportunity Fund, UCSF School of Pharmacy | Cross-sectional electronic or paper survey | 502/803 (63%) student pharmacists who had completed HC curriculum, all pharmacy schools in California | Pharmacist-prescribed contraception, prior to passage of California law | Interest  Motivators  Comfort  Barriers | Rafie 2011  Interest in providing HC services:  Both minors and adults (53%)  Adults only (41%)  Minors only (6%)  Overall (96%)  Factors associated with interest:  EC certification vs. not (p<0.001)  Female vs. male (p=0.02)  White or Hispanic/Latino(a) vs. Asian/Pacific Islander or black (p=0.005)  Value authorizing refills for HC (83%)  Opinions on pharmacy access to HC:  Improve patient access, advice (94%)  Valuable service (93%)  In pharmacist’s scope of practice (89%)  May increase use, convenience, and adherence to HC (85%)  Pharmacists are well trained (80%)  Added responsibility and liability (76%)  Fee for HC services is appropriate (87%)  Barriers to pharmacy access:  Inadequate pharmacist time (96%)  Lack of private counseling area (91%)  Lack of patient health info (93%)  Increased responsibility, liability (88%)  Concern about patients receiving annual exam (91%)  Lack of incentive structure (89%)  Difficult to show value to public (83%)  Lack of support personnel (79%)  Pharmacist not knowledgeable enough (73%)  Lack of drug info resources (72%)  Rafie 2014  Confidence providing HC services:  Counseling on: proper use of HC (94%);  failures, mishaps, barrier methods (95%)  Know when to refer to physician (94%)  Screening prior to ordering HC (91%)  Adjusting or switching orders (72%)  Safely ordering HC for minors (69%)  Comfort- Feel adequately educated (65%)  Interest in more education on:  Appropriate product selection (79%)  Switching between products (77%)  Off label use of HCs (59%)  Drug interactions (55%)  Counseling on HC mishaps (51%)  Side effects and possible risks (50%)  When to refer to physician (48%)  Contraindications (46%) | Sampled from all California pharmacy schools, students who had completed an HC curriculum  Appropriate descriptive and analytic technique (chi-square and Wilcoxon rank-sum tests) | 63% response rate; no comparison of non-respondents and respondents, but sample characteristics representative of student pharmacists in California  <10% missing for demographic variables; missing not reported for most outcome variables, but <4% missing for outcomes with response rates  Reliability and validity of survey constructs not established  No formal assessment, but survey reviewed by health professionals, public health experts, and student pharmacists  May be generalizable to target population (California student pharmacists who completed HC curriculum); not generalizable to all California student pharmacists | Bias  Selection bias:  Moderate  Information bias:  Moderate  Analysis bias:  Low  Generalizability  Fair |
| Vu, 2019, William and Flora Hewlett  Foundation and the Skaggs Fund | Cross-sectional electronic survey | 121 pharmacists practicing in a direct patient care setting, California; 257/1774 (14%) responded, 121/257 (47%) eligible | Pharmacist-prescribed contraception, after passage but prior to implementation of California law | Interest  Motivators  Comfort  Barriers | Interest in prescribing:  Initiating therapy (65%)  Making dosage/formulation adjustments (65%)  Making method adjustments (60%)  Administering injectables (42%)  Likelihood of prescribing (73%)  Factors associated with likelihood:  Female (85%) vs. male (66%) (p=0.03)  Work in pharmacy with EC services/ prescribe EC (82%) vs. not (63%) (p=0.03)  Factors not associated:  Age, years in practice, pharmacist role, having EC training, completing residency, graduated California pharmacy school, work setting, pharmacy location, number of prescriptions filled per week  Motivators- Reasons likely to prescribe, among those likely to (n=88):  Improve patient access, advice (97%)  Pharmacists are well trained (93%)  May increase HC use, adherence (93%)  Professional development (91%)  Important public health issue (90%)  Enjoy individual patient contact (89%)  Strengthen relationship with local physicians, clinics (82%)  Increase business/revenue (77%)  Help recruit pharmacists (44%)  Comfort with prescribing:  Intervene on drug-drug interaction (98%)  Identify drug interactions (97%)  Measure blood pressure (98%)  Measure weight (94%)  Comfort- Desire additional training on:  Switching methods (80%)  Risks and benefits of HCs (80%)  Helping patients select method (79%)  General info about HC options (79%)  How to identify contraindications (76%)  Drug-drug interactions with HC (70%)  Counseling patients on mishaps (69%)  Off-label use of HC (66%)  Advising on preventive services (65%)  How to perform blood pressure (24%)  Barriers- Reasons unlikely to prescribe, among those unlikely to (n=33):  Time constraints (88%)  Liability issues (82%)  Believe pelvic exam and pap smear are necessary for prescribing safely (76%)  Resistance from physicians (58%)  Not interested in this service (33%)  Not interested in clinical services (21%)  Personal or religious beliefs (21%)  Barriers to prescribing:  Time constraints (74%)  Lack of reimbursement (64%)  Liability concerns (62%) | Sampled all California Pharmacists Association members from employee pharmacist and pharmacy owner academies, excluding those practicing in settings where dispensing HC doesn’t apply  <10% missing for demographic and most outcome variables  Appropriate descriptive and analytic technique (chi-square to test factors associated with intention to prescribe) | 14% (257/1774) response rate, of which 47% (121/257) met inclusion criteria; no comparison of non-respondents and-respondents  Reliability and validity of survey constructs not established  No formal assessment, but pharmacists and student pharmacists reviewed the survey for clarity and content  Likely not generalizable to target population due to low response rate | Bias  Selection bias:  High  Information bias:  Moderate  Analysis bias:  Low  Generalizability  Poor |
| Landau, 2009, David and Lucile Packard Foundation and William and Flora Hewlett Foundation | Cross-sectional electronic survey | 2,725/14,142 (19%) pharmacists, American Pharmacists Association (APhA) | Pharmacist-prescribed contraception, prior to passage of laws in any state | Interest  Motivators  Comfort  Barriers | Interest in providing pharmacy access to HC (85%)  Factors associated with interest:  California vs. other areas (p<0.05)  Factors not associated:  Practice setting, years of experience, and gender  Among pharmacists interested in providing HC services  Interest in types of provision of care:  Switching methods (73%)  Adjusting dosages (64%) Initiating HC (57%)  Motivators for interest:  Important public health issue (98%)  Individual patient contact (97%)  Professional development (97%)  Strengthen relationship with physician/clinics (96%)  Increase business (88%)  Helping recruit pharmacists (59%)  Comfort with activities:  Measuring blood pressure (95%)  Measuring weight (94%)  Asking risk assessment questions (95%)  Educating on proper use of HC (97%)  Scheduling follow-ups (96%)  Asking questions about sexual history (85%)  Asking questions about sexual activity (47% “very comfortable”)  Comfort- Desire additional training on:  Helping patients select method (88%)  Identifying those not suitable for HC (84%)  Risks and benefits of HC (77%)  General info about HC options (74%)  Barriers to pharmacy access to HC:  Lack of payment mechanisms (66%) Liability (57%)  Time constraints (56%)  Lack of private counseling area (44%)  Resistance from physicians (44%)  Cost to set up service (33%)  Corporate policies (33%)  Among pharmacists not interested in providing HC services  Barriers- Reasons for lack of interest:  Time constraints (90%)  Believe pelvic exam/Pap smear necessary for prescribing HC (88%)  Resistance from physicians (82%)  Personal/religious beliefs (58%)  Not interested in this service (89%)  Not interested in clinical services (54%) | Stratified random sample (14,142 of 50,000) of APhA members working in community chain and community independent pharmacies  0% missing for demographic variables (except 14% for US state); <2% missing for most outcome variables  Survey tested by APhA staff, experts, and practicing pharmacists  Appropriate descriptive and analytic technique (chi-square to test between-group differences) | 19% response rate; no comparison of non-respondents and respondents  Reliability and validity of survey constructs not established  Likely not generalizable to target population (US pharmacists) due to low response rate | Bias  Selection bias:  High  Information bias:  Moderate  Analysis bias:  Low  Generalizability  Poor |
| Rodriguez, 2018, Women’s Reproductive Health fellow and National Institutes of Health | Longitudinal electronic survey | 121/732 (17%) pharmacists at 6 months and 62/121 (51%) pharmacists at 12 months, practicing in Oregon and certified to prescribe HC | Pharmacist-prescribed contraception, 6 and 12 months after implementation of Oregon law | Interest  Motivators  Comfort | *Results presented for 12-month survey. Results at 6-month survey were similar to results at 12 months.*  Interest in services:  Managing adverse effects (73%)  Initiating HC for adolescents (54%)  Initiating/administering injectables (41%)  Offering implants through a CPA (13%)  Motivators for prescribing (agree or somewhat agree):  Increase access to contraception  Reduce unintended pregnancy  Increase scope of practice  Comfortable with eligibility protocol  Comfort with counseling and prescribing (90%)  Comfort- Desire additional training:  Contraindications (59%)  Client-centered counseling (43%)  Reproductive screening tests (43%)  Risks and benefits of HC (37%)  Contraceptive efficacy (25%)  How to rule out pregnancy (22%)  Preconceptual counseling (21%) | Sampled all pharmacists who had completed HC training and were practicing in Oregon  Appropriate descriptive analysis | 17% (121/732) response rate at 6 months, 51% (62/121) response rate at 12 months; no comparison of non-respondents and respondents  0-6% missing for demographic variables; missing not reported for most outcome variables, but 14-22% missing for variables with response rates  Reliability and validity of survey constructs not established  Survey questions based on literature review; no explanation of piloting or testing  Likely not generalizable to target population due to low response rate | Bias  Selection bias:  High  Information bias:  High  Analysis bias:  Low  Generalizability  Poor |
| Gardner, 2008, National Institute of Child Health and Human Development | Interviews and focus groups in a longitudinal community-based intervention | 26 community pharmacists, Metropolitan Seattle | Direct access to contraception through collaborative drug therapy agreements, which Washington pharmacy act has allowed since 1979 | Interest  Motivators  Comfort | Interest- All wanted to continue providing contraception after study end  Motivators for participating:  Providing a needed service to community  Help women have easier access to contraception  All were comfortable and confident initiating, counseling, and managing contraception; felt that enrolling patients was “awkward the first time”  All reported positive patient feedback; believed that women were very satisfied  Confusion around continuing HC prescriptions for women using other medications that excluded them from the study protocol  Confusion around evaluating headaches |  | Pharmacists recruited from two regional pharmacy chains; pharmacies selected by number of EC prescriptions written  25% (2/8) pharmacies dropped out of study  42% (11/26) pharmacists did not provide responses  Reliability and validity of qualitative constructs not established  No explanation of piloting or testing  No description of qualitative coding; no description of thematic analysis; investigator validated some interviews  Not generalizable to Washington pharmacists due to sampling frame | Bias  Selection bias:  High  Information bias:  High  Analysis bias:  High  Generalizability  Poor |
| Gomez, 2019, funding not reported | Cross-sectional telephone interviews | 36 pharmacists, community-based, independent pharmacies, California | Pharmacist-prescribed contraception, after implementation of California law | Interest  Motivators  Barriers | Interest in completing HC training, among those not yet trained (96%)  Motivator- Pharmacy provision of HC is an important health and community service (94%)  Motivators to prescribing:  Expand pharmacists’ role, responsibility  Increase patient access- pharmacists more available than physicians, reduced cost and barriers for patients  Reduce pressure on healthcare system: reduce physician workload, reduce costs  Barriers to prescribing:  Limited resources- no private consulting space, staff resources, time, training cost  Lack of financial incentive, service fees, start up fees  Lack of perceived customer interest and knowledge of the service  Liability, malpractice coverage  Medical risks- lack of access to patient history and ability to monitor health, patients may substitute physician with pharmacist visit, lack of public understanding of risks of estrogen | Random sample of 270 independent pharmacies in California  <3% missing for demographic variables; all respondents answered questions  Appropriate analytic technique (two team members coded each transcript, examined coding for themes) | 36 pharmacists responded from 270 sampled pharmacies; pharmacist denominator not reported; no comparison of non-respondents and respondents  Reliability and validity of survey constructs not established  Development of codebook based on themes and literature review; no explanation of piloting or testing  Not generalizable to California pharmacists due to low response rate | Bias  Selection bias:  High  Information bias:  High  Analysis bias:  Low  Generalizability  Poor |

~%= estimate from article figure or text

BSPh= Bachelor of Science in Pharmacy

CI= confidence interval

CPA = collaborative practice agreement

EC= emergency contraception

HC= hormonal contraception

OC = oral contraceptive

OTC = over the counter

PharmD= Doctor of Pharmacy