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Development and validation of a perceived abortion self-efficacy scale: results from Bolivia, Nepal and Nigeria

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Abstract: *The objective of this research was to develop and assess the validity of a scale to measure perceived abortion self-efficacy (PASE). Perceived abortion self-efficacy is defined as an individual's perceived confidence in their ability to carry out the tasks necessary to end a pregnancy safely and successfully. During the first phase of this study between February and April 2018, we conducted qualitative research using in-depth interviews and focus group discussions with women in Bolivia, Nepal, and Nigeria to explore domains of PASE. Using the qualitative data, we prepared a draft set of measures with 31 items. In October and November 2018, the second phase of the study included field testing 31 draft items with a convenience sample of approximately 1200 women across the three study countries. Exploratory factor analysis was conducted to identify an appropriate scale structure, resulting in a 15-item, 3-factor model. The three factors represent the concepts of enlisting social resources, accessing information and care, and resilience. In the third and final phase in September and October 2019, the validity of the 15 scale items was assessed. The scale was administered to a new sample of approximately 400 women in each country. Confirmatory factor analyses were conducted to test model fit for the scale structure identified during the second phase. The results from this study suggest that the final PASE scale has considerable potential to be a valid measure of PASE. The new 15-item PASE scale presented in this paper can be used to evaluate programmes or interventions designed to improve women's PASE and to assess the state of PASE in populations. DOI: 10.1080/26410397.2023.2240570*

Keywords: perceived abortion self-efficacy, scale development, factor analysis, confidence, Nepal, Bolivia, Nigeria

Background

The concept of self-efficacy was first coined by psychologist Albert Bandura in 1977.¹ He defined self-efficacy as the conviction that a person can enact a required behaviour to produce an outcome. He further theorised that when facing obstacles to enact a behaviour, the greater the person's perceived self-efficacy, the more effort they will put toward enacting that behaviour to achieve their desired outcome. Bandura hypothesised that perceived self-efficacy is influenced by four factors: performance accomplishments, vicarious experience, persuasion, and emotional arousal.

Performance accomplishments include previous experiences in mastering the desired behaviour. When successful, self-efficacy increases, but when failures are repeated, self-efficacy is lowered. Vicarious experience is when a person sees others enact a specific behaviour without negative effects and this improves the person's self-efficacy by emboldening them to persist. Persuasion is when a person receives encouragement from others and/or their environment that they can enact a behaviour. Emotional arousal is when a stressful situation prompts a reaction, either coping or non-coping behaviour, and perceived self-

efficacy when high can improve reactions to threatening situations. Emotional arousal, when very high, can negate performance, and fear reactions can intensify stressful situations and mitigate actions.¹

Self-efficacy theory is utilised to understand and address a range of health-related behaviours, including reproductive health ones, and topic-specific self-efficacy measurement tools have been developed and validated for issues ranging from breastfeeding to contraceptive use.^{2–6} Upadhyay and colleagues used self-efficacy theory as a domain in the development of a measure for sexual and reproductive empowerment for adolescents and young adults.⁷ Additionally, research has shown a correlation between levels of self-efficacy and use and continuation of contraceptive methods,^{8,9} demonstrating that self-efficacy affects women's sexual and reproductive health behaviours.

However, there has been limited scientific inquiry into the relationship between self-efficacy and abortion. Research in India by Banerjee and colleagues in 2012 found self-efficacy related to family planning and abortion decision-making to be an enabling factor for access to safe abortion services.¹⁰ Self-efficacy was further expanded upon by Banerjee and colleagues in 2015 with the creation of a composite measure to assess self-efficacy that included a woman's ability to express her own opinions to elders, discuss SRH issues with a provider and with friends, and refuse sex.¹¹ Using this measure of self-efficacy, this study found that youth in Jharkhand, India had limited self-efficacy regarding their own health, but that married youth had higher self-efficacy than unmarried youth. Banerjee's measure of self-efficacy did not measure abortion self-efficacy, rather self-efficacy, or confidence in a woman's ability to perform other SRH-related behaviours (i.e. refuse sex and discuss SRH).

Researchers in Ghana examined abortion self-efficacy, in particular the relationship between abortion self-efficacy and sociodemographic characteristics of women. In this study, abortion self-efficacy was measured by asking whether a woman felt that she could decide on her own to have an abortion.¹² Using this single-item measure of abortion self-efficacy, Owoo and colleagues found that the absence of a male partner, women's ownership of a bank account, higher levels of education, access to health facilities, and perception of the legality of Ghana's abortion

laws were all significant predictors of abortion self-efficacy. This single-item measure of abortion self-efficacy is limiting because it is unable to capture the complexity of perceived self-efficacy or confidence women have in getting abortion information and care. Additionally, this measure was developed in and for a single country and has not been tested and validated in multiple settings. In the research to date, no other measures have been created or used to represent abortion self-efficacy.

The goal of this research was to develop a valid and reliable scale to measure women's perceived abortion self-efficacy (PASE) that can be used in the design and evaluation of community-based interventions aimed at improving abortion self-efficacy. PASE can be defined as an individual's confidence in their ability to carry out the tasks necessary to end a pregnancy safely and successfully. PASE scale development included three focal countries – Bolivia, Nepal, and Nigeria – where Ipas has health system and community programming. Ipas is a global nongovernmental organisation dedicated to ensuring that women can obtain safe, respectful, and comprehensive abortion care, including counselling and contraception to prevent future unintended pregnancies. These three countries also represent varied legal contexts related to abortion. Nepal has the least restrictive abortion laws where abortion is available upon request up to 12 weeks of pregnancy, and up to 28 weeks of pregnancy in the case of rape or incest, pregnancies risking the physical and mental health of the women and pregnancies with fetal impairments incompatible with life.¹³ Bolivia has more restrictive abortion laws than Nepal that allow abortion only in the case of rape, incest, or mental health of the pregnant person.¹³ Lastly, Nigeria has the most restrictive abortion laws of the three countries. In Nigeria, abortions are only permitted to save the life of the pregnant person.¹³ These three countries were selected to represent multiple legal and cultural contexts in the development of a PASE scale.

Methods

To develop the perceived abortion self-efficacy scale, we conducted a sequential, three-phased, mixed-methods design. In Phase 1, we first explored abortion self-efficacy in three countries – Bolivia, Nepal, and Nigeria – through qualitative

methods and used the findings to develop items for a scale to measure perceived abortion self-efficacy. In Phase 2, the items developed in the first phase were fielded in the three study countries. In Phase 3, we validated the items tested in Phase 2 with a new study sample in the same three study countries. We conducted all three phases of this study in selected regions in Bolivia ($n = 3$), Nepal ($n = 4$), and Nigeria ($n = 6$). Within each region, we purposefully selected rural and urban areas for inclusion in the study. We selected geographies based on the need to leverage recruitment support of Phase 1 study participants from Ipas partners and the desire to have a diverse study sample.

This design follows a standard procedure for new-scale development.¹⁴ Each phase of the scale development process is described in detail below. The study protocols were approved by the Nepal Health Research Council (IRB No.: 462/2017, December 24, 2017, and 732/2019, September 24, 2019), National Health Research Ethics Committee of Nigeria (IRB No.: NHREC/01/01/2007-21/12/2017, February 19, 2018 and renewal on September 25, 2019), and the United States-based Allendale Investigational Review Board (IRB ID: “Ipas_BoliviaSelfEfficacy_Jan2018”, January 11, 2018 and “Ipas_BoliviaSelfEfficacy_P3_Aug2019”, September 5, 2019).

Phase 1: Exploring abortion self-efficacy

We conducted 130 in-depth Interviews (IDI) and 52 focus group discussions (FGD) between February and April 2018 with women of reproductive age to explore concepts of abortion self-efficacy. Specifically, we explored cognitive, emotional, and behaviour beliefs and skills that give women the confidence to end a pregnancy successfully and safely. We developed semi-structured IDI and FGD guides (in English) based on existing self-efficacy literature.¹ Guides were translated into Spanish (for Bolivia), Nepali (for Nepal), Hausa, Igbo, Pidgin English, and Yoruba (for Nigeria). All translated guides were reviewed and approved by members of the research team fluent in each language during the data collector training. After translation of the IDI guide, but before primary data collection, we conducted cognitive interviews of the translated IDI guide with 4–5 women in Bolivia and Nigeria to ensure that the questions were understood by our intended audience. We were unable to conduct cognitive interviews in Nepal.

IDIs and FGDs included married and unmarried women of reproductive age (15–49) in both urban and rural settings. To ensure that the resulting scale meaningfully captured perceived abortion self-efficacy for diverse groups of women in each country, we segmented the IDIs by rural or urban residence, age (15–19 years and greater than or equal to 20), and by abortion experience (yes/no). We segmented the FGDs by rural or urban residence and marital status. Previous abortion status was not relevant to FGD participation.

For participants of the IDIs and FGDs, the eligibility criteria included: (1) being between 15 and 49 years of age, (2) currently living in specified study geography, and (3) ability to provide informed consent. To be eligible for the IDIs with women with abortion experience, a person had to report having had an abortion in the past 5 years and be willing to share their experience(s). Additionally, Phase 1 participants were screened on their willingness to talk about induced abortion and their opinion on whether abortion is an acceptable option for women who have an unwanted pregnancy. This screening was necessary to ensure that we did not have a sample of women who were against abortion and therefore could not or would not provide insights into what women need to be able to safely end a pregnancy.

IDI and FGD participants were recruited by research team members in collaboration with Ipas staff and partners in the study area using convenience sampling. Recruitment locations varied by country and included health facilities and events organised by Ipas partners. We obtained approval from health facilities and other Ipas partners prior to recruitment efforts. Once a participant was confirmed eligible, they provided written informed consent prior to beginning an IDI or participating in an FGD. Participants 15–17 years old could provide assent and did not require parental consent to participate in the IDIs or FGDs. Parental consent was waived by the ethical review boards in each country on the following grounds: (1) this was a minimal risk study, and (2) adolescents legally can decide to undergo SRH services therefore can decide to participate in a study related to SRH.

IDIs and FGDs were conducted by female interviewers and facilitators. Interviewers and facilitators participated in a multi-day training to ensure adherence to the study protocol, execution of high-quality IDIs and FGDs, and adherence to

established ethical procedures. IDIs and FGDs were conducted in private locations where auditory and visual privacy could be maintained and where the safety and security of the participants and research staff could be guaranteed. Interview and focus group discussion locations included private rooms in a local community centre, school, or health facility. The exact location of the interviews and FGDs was dependent on the recruitment location and was prearranged by fieldwork coordinators. All IDI and FGD participants received the equivalent of \$US 15, dependent on the country, as remuneration for their participation.

All IDIs and FGDs were digitally recorded and transcribed by interviewers/facilitators, following a prescribed transcription protocol. Once the recordings were transcribed, professional translators translated the IDI and FGD transcripts into English. A random selection of English language transcripts was compared to the original language transcripts by research team members to check for accuracy of the translation.

Study team members from each of the study countries conducted a thematic analysis to analyse the transcripts. Each team member read the transcripts and developed a codebook based on *a priori* and emergent themes. Each team member then coded transcripts from their country using Atlas.ti. The principal investigator read all transcripts and double coded approximately 30% to ensure consistency in coding and the remaining transcripts were single coded by a team member. The full team analysed the coded content to identify the primary themes related to abortion self-efficacy. Nine themes were identified: (1) economic needs, (2) social support, (3) knowing where to go, (4) confidentiality, (5) safety, (6) determination of decision, (7) knowledge of others' experiences, (8) personal abortion experience, and (9) one's social environment.

Using emergent themes and theme-specific text from the IDIs and FGDs, study team members developed potential scale items. Team members formulated items in the form of declarative statements that represented a respondent's confidence in her ability to end a pregnancy successfully and safely, i.e. "I know where to get information about safe abortion", or "I can gather the money necessary to pay for an abortion". Each team member independently generated as many scale items as necessary to fully capture the concept of abortion self-efficacy. After all items had been developed, the study team discussed and refined the items,

removed redundancies, and finalised a list of 31 test items. We conducted a second round of cognitive interviews with women across all countries (5 from Bolivia, 5 from Nigeria, and 5 from Nepal) to ensure the items were understood by the intended audience. Slight modifications were made to the items based on the results of the cognitive interviews.

Phase 2: Field testing items

In October and November 2018, we conducted Phase 2 in which the 31 abortion self-efficacy items were incorporated into a questionnaire that captured sociodemographic characteristics of respondents and respondents' knowledge of and experience with abortion. For the self-efficacy items, respondents were asked to put themselves in a hypothetical situation in which they want or need an abortion and are then asked to rank how confident they are, ranging from "not at all confident" (0) to "completely confident", (10) in their ability to carry out the task detailed in each item. A visual aid was used to assist respondents in ranking their confidence for each item (0–10 Likert scale). To ensure a respondent's understanding of the confidence ranking, three practice items were included in the questionnaire. The sociodemographic characteristics included in the questionnaire were age, educational attainment, marital status, and social status. Social status was measured using two items from the McArthur Scale of Subjective Social Status¹⁵ created by Adler and colleagues¹⁶ in which respondents view a drawing of a ladder with 10 rungs and are told that the ladder represents where people stand in society or in their community. Respondents were asked to rank themselves on the ladder relative to others in their society and in their community. Lastly, the questions related to knowledge of abortion and experiences with abortion were included to test the validity of the final scale (mentioned in more detail in Phase 3: Validation of Scale). The questionnaire was fielded in Spanish, Nepal, English, and four Nigeria-specific languages.

Although there are variations in the suggested sample size needed for scale development, we aimed for approximately 100 women in each country's specified study geographies (Bolivia = 3, Nepal = 4, and Nigeria = 6). This approach ensured that we would likely achieve the suggested minimum of 10 respondents per scale item per country.¹⁴ Within each specified geography, we designed a purposive quota sample where

50% of data were collected in rural areas and 50% in urban areas. Within each rural and urban setting, the quota sample had to include women ages 15–19 with a secondary education or below (40%), married women aged 20–49 with a secondary education or below (20%), unmarried women aged 20–49 with secondary education or below (20%), and married or unmarried women aged 15–49 with a tertiary education (20%). The use of a purposive quota ensured that our sample included married and unmarried women aged 15–49 from a variety of educational backgrounds.

Phase 2 respondent eligibility criteria included: (1) being 15 between 49 years of age, (2) currently living in specified study geography, and (3) ability to provide informed consent. Additionally, we included a fourth criterion – not having previously been permanently sterilised – to ensure the participant could imagine themselves in the hypothetical scenario of wanting or needing an abortion. Like Phase 1, all potential respondents were screened on their willingness to answer questions about induced abortion. People that responded affirmatively to both screening questions were considered eligible to participate.

The questionnaire was fielded by trained interviewers on pre-programmed mobile devices. All data were collected anonymously. Women who agreed to complete the structured survey underwent an informed consent process led by the interviewer and their completion of the survey served as documentation of consent. Parental consent was waived for participants 15–17 years old.

Data collectors recruited and screened women in public gathering places within the defined study locations such as parks, markets, and university areas. The data collectors recruited and interviewed women in each geography until the purposive quota sample was fulfilled. Interviews were conducted in locations where auditory privacy could be maintained and where the safety and security of the participants and research staff could be guaranteed. The exact location of the interview was dependent on the recruitment location and was prearranged by fieldwork coordinators. All participants received a gift card with cell phone minutes valuing \$US 5–15 (dependent on the country) as remuneration for their participation.

We recruited 1316 women for Phase 2 of this study. We tracked the number of women approached to participate in Phase 2 but who

declined to participate, which was 221 women of the 1657 women approached. We also tracked the number of women interested but not eligible because they did not meet the demographic criteria (46 women) or were unwilling to talk about abortion (23 women). An additional 48 eligible women were excluded by data collectors once sample quotas were reached to avoid oversampling in a particular sociodemographic characteristic. Lastly, three women did not provide informed consent and another eight women abandoned the survey during the interview. This resulted in a total of 1308 women completing the questionnaire in Phase 2. Given that Nigeria collected data in more geographies than Bolivia and Nepal, we randomly excluded 212 Nigeria observations from the Phase 2 analyses to avoid an over-representation of Nigerian respondents in the analysis.

The appropriateness of the dataset for exploratory factor analysis (EFA) was explored in multiple ways using Stata SE 16. Due to similarities among the 31 fielded self-efficacy items, data exploration and EFA were limited to 21 items. First, we tested for multivariate normality and sample adequacy using Bartlett's test of sphericity (which indicates if there are sufficient correlations in the data to run a factor analysis) and Kaiser–Meyer–Olkin (KMO) (which indicates if there are enough observations in a dataset for running a factor analysis). Although the data were not normally distributed, this assumption does not typically have to be met if the Bartlett's sphericity test and KMO for sampling adequately are sufficient, that is a p -value of <0.05 and a value of >0.80 , respectively. Our sampling adequacy was sufficient with a Bartlett's result of <0.001 and a KMO of 0.972. Next, we checked the inter-item correlations and tested for multicollinearity. The inter-item correlations were all >0.40 and the squared multiple correlations were all greater than 0.10 but less than 0.90, indicating no items needed to be dropped from the analysis.

We performed EFA using the iterative principal factor command in Stata to identify an appropriate scale structure. The number of factors to retain was determined by “complex parallel analyses” and interpretability of the factors. Items with factor loadings >0.45 were retained. Items that loaded at >0.32 on more than one factor were eliminated from the model, as were items that had a uniqueness score of >0.60 . Oblique rotation was used to allow for correlation between the factors.

Once the factor structure was determined, the scale reliability was confirmed by calculating an alpha coefficient. A Cronbach's alpha score of >0.70 indicates that a scale's set of items are closely related to each other.

Phase 3: Validation of scale

In September and October of 2019, we conducted Phase 3. In this phase, the scale items were administered to a new sample of approximately 400 women in each country using the same procedures described in Phase 2.

In Phase 3, we recruited 1282 women for this study. Similar to Phase 2, we tracked the number of women approached to participate, which was 1488. Out of these, 113 declined to participate after the initial approach by the data collector. Additionally, 39 did not meet demographic criteria, nine were excluded to avoid oversampling in any sociodemographic characteristics, 38 were not willing to talk about abortion, and seven did not provide informed consent. Of the 1282 women recruited for this study, 14 abandoned the survey during the interview resulting in a total sample of 1268 women.

We conducted confirmatory factor analyses (CFA) to test model fit for the scale structure identified during Phase 2. We utilised three goodness-of-fit statistics to assess the fit: root mean square error of approximation (RMSEA), standardised root mean squared residuals (SRMR), and comparative fit index (CFI). We tested reliability of the scale using Cronbach's alpha, with a coefficient >0.80 considered acceptable. Results of these tests are detailed in Table 3 in the Results section. We calculated perceived abortion self-efficacy scores by summing the final 15 items for the total score and dividing by the number of items, 15, to create a summed score average. We also calculated the summed score averages for each of the three subscales using the appropriate items for each. A higher score represents greater levels of abortion self-efficacy. We estimated these means and standard deviations by study country and used Kruskal–Wallis equality of populations rank test to test for score and sub-score differences by country. Results of these tests are detailed in Table 4 in the Results section.

We tested the validity of the scale, how well it measures what it is intended to measure, by assessing the construct and concurrent validity of the final scale items. We assessed the construct validity – the extent to which the new scale is

associated with variables known to be related to self-efficacy – by examining the relationship between PASES scores and abortion-related knowledge and experience items. The abortion knowledge items included whether she knew (1) safe ways to have an abortion, (2) where to get information about safe abortion, and (3) where to get a safe abortion. Women were asked to rate their agreement to each knowledge statement on a 4-point scale from “strongly disagree” to “strongly agree”. The measures were dichotomised to compare “strongly disagree” and “disagree” responses with “strongly agree” and “agree” responses. The abortion-related experience items we used to assess construct validity were related to three of the four domains of Bandura's self-efficacy framework¹: vicarious experience (five items), personal experience (one item), and persuasion (one item). Vicarious experience items included knowing someone close to you who has had a safe abortion, knowing other women who have had a safe abortion, having helped someone seeking information about abortion, having ever helped someone seeking abortion services, and having ever accompanied someone during an abortion. Similar to the abortion-related knowledge items previously mentioned, women were asked to rate their agreement to each knowledge statement on a 4-point scale from “strongly disagree” to “strongly agree” and the measures were dichotomised to compare strongly disagree and disagree responses with “strongly agree” and “agree” responses. The remaining vicarious experience items were assessed with response options of “yes” and “no”. The personal experience item was having had an abortion, and the persuasion item was having heard or seen positive messages about safe abortion in the area where they live. Both these items were assessed with response options of “yes” and “no”. We hypothesised that respondents reporting having abortion-related knowledge and experience would have significantly higher perceived abortion self-efficacy than respondents reporting no abortion-related knowledge or experience.

Concurrent validity is the extent to which the scale is associated with another measure of self-efficacy. We tested concurrent validity by examining the association between PASES scores and responses to a single item: “If you wanted or needed an abortion, you could get one.” For this measure, women were asked to rate their

agreement to each knowledge statement on a 4-point scale from “strongly disagree” to “strongly agree”. The measures were dichotomised to compare “strongly disagree” and “disagree” responses with “strongly agree” and “agree” responses. We hypothesised that this similar measure of self-efficacy would associate positively with women’s PASE using the scale.

We assessed construct and concurrent validity of the final scale using Student’s *t*-test to assess the difference in PASES score by each of the dichotomised validity measures. Construct and concurrent validity were also assessed using logistic regression. Each dichotomised validity measure was included as a dependent variable and high or low PASES score as the main independent variable in each model. High PASES scores were defined as scores 6 and higher, while low PASES scores were defined as under 6. Adjusted models included variables pre-specified as potentially able to affect perceived abortion self-efficacy which were sociodemographic characteristics of respondents. This included country, age (continuous), marital status, education level, both subjective social status measures, and whether the respondent lived in an urban or rural area. All quantitative analyses were conducted with StataSE 14 & 16.

Results

Phase 2 and Phase 3 respondents’ characteristics

The final Phase 2 sample included in this analysis consisted of 1096 respondents: 27% from Bolivia, 36% from Nepal, and 37% from Nigeria (Table 1). In line with the quota sampling, nearly half (49%) of respondents were from urban locations in their country and nearly a third (32%) of respondents were married. Respondents ranged in age from 15 to 49 with a mean age of 24. Further, 28% of respondents had attended primary school, 48% attended secondary school and 22% attended technical school or college/university schooling. Respondents’ mean self-reported rating of their social standing in their community was 6.1 and mean self-reported rating of best-off to worst-off in the country was 4.8. Additionally, 71% of Phase 2 respondents and 65% of Phase 3 respondents categorised themselves as moderate or high socioeconomic status, indicating that lower-income populations are not over-represented in the sample due to the offered remuneration.

The total Phase 3 sample included in this analysis consists of 1268 women: 34% from Bolivia, 32% from Nepal, and 34% from Nigeria. Similar to the characteristics of Phase 2 respondents and consistent with the sample quotas, half (50%) were from urban locations in their country and nearly a third (31%) were married. Additionally, Phase 3 respondents ranged in age from 15 to 49 with a mean age of 25.

Due to our quota sampling, the Phase 2 and Phase 3 samples were similar across three of the four demographic characteristics – urban versus rural geography, age, and marital status. However, with respect to educational status, we find that Phase 3 respondents had a lower educational status than Phase 2 respondents. A higher proportion of Phase 3 respondents attended primary school (37% in Phase 3 compared to 28% in Phase 2) and fewer attended secondary school (40% in Phase 3 compared to 48% in Phase 2) and technical school, college, or university (20% in Phase 3 compared to 22% in Phase 2). This educational difference in the combined Phase 2 and Phase 3 samples is driven by educational differences between the Phase 2 and 3 respondents in the Nepal sample. The Nepal sample had a higher proportion of respondents with primary school education in Phase 3 (45%) compared to Phase 2 (20%), and lower proportion of respondents with secondary school education in Phase 3 (32%) compared to Phase 2 (54%) (data not shown). The reason for this educational difference between the Phase 2 and Phase 3 sample in Nepal is unknown.

Phase 2: Exploratory factor analysis

EFA resulted in a 15-item, 3-factor model with an excellent reliability coefficient ($\alpha > 0.90$). Of the six items that were dropped, four were dropped for low factor loadings (i.e. < 0.45) or high uniqueness (> 0.60) and two were dropped due to cross-loading (i.e. loading heavily on more than one factor). The three factors represent the concepts of enlisting social resources, accessing information and care, and resilience. The enlisting social resources factor contains six items related to a person’s confidence in asking for various types of support, including informational, emotional, and financial. The accessing information and care factor contains six items related to a person’s confidence in getting safe and accurate abortion information and care. Lastly, the resilience factor contains three items related to a person’s confidence in their ability to be resilient in the face

Table 1. Respondent characteristics (Phase 2 and Phase 3 Sample)				
	Phase 2		Phase 3	
	<i>n</i>	(%)	<i>n</i>	(%)
Total women who completed the survey	1096		1268	
Country**				
Bolivia	299	27	432	34
Nepal	397	36	401	32
Nigeria	400	37	435	34
Geography				
Urban	539	49	638	50
Rural	557	51	630	50
Age				
Mean, median	24.1	22	24.6	22
min, max, SD	(15, 49)	8.1	(15, 49)	8.5
Ages 15–19	448	41	509	40
Ages 20–29	384	35	427	34
Ages 30–39	194	18	231	18
Ages 40–49	70	6	101	8
Marital Status				
Married	350	32	396	31
Unmarried	746	68	872	69
Education Status***				
No formal education	24	2	38	3
Primary school	309	28	464	37
Secondary school	527	48	511	40
Post-secondary school ¹	236	22	255	20
Subjective Social Status				
Standing in the community rating				
mean, median	6.1	6	6.1	6
min, max, SD	(1, 10)	2.5	(1, 10)	2.4
Low SES (1–3)	176	16	177	14
Moderate SES (4–7)	580	53	697	55
High SES (8–10)	340	31	394	31

Best-off to worst-off in the country rating*				
mean, median	4.8	5	4.6	5
min, max, SD	(1, 10)	2.3	(1, 10)	2.4
Low SES (1–3)	320	29	434	34
Moderate SES (4–7)	638	58	665	52
High SES (8–10)	138	13	169	13

Note: Statistical significance based on chi-squared test for categorical variables and *t*-test for continuous variables.
 * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. ¹“Post-secondary school” includes technical school, college and university education.

of abortion stigma. Table 2 provides the final factor loadings and uniqueness values for the 15 items.

Phase 3: Confirmatory factor analysis

CFA results indicate a strong model fit on the independent sample, with key goodness-of-fit statistics well within the acceptable range (Table 3) – specifically, root mean square error of approximation 0.90. The reliability coefficients for the three subscales and the full 15-item instrument provide evidence of appropriate internal consistency (Table 4).

PASE scale scores and subscale scores

Table 5 displays the scores for the full scale and three subscales for each country and each phase of the study. Phase 2 respondents scored between 6.1 and 6.2 for the full scale and three subscales. These scores are similar to the full scale and three subscale scores of Phase 3 respondents, ranging from 6.0 and 6.2.

Full scale and subscale scores were significantly different between countries for both phases ($p < 0.001$). Comparing scores between the countries, we find that Nepalese respondents had the highest scores of the three countries for the full scale and the subscales in both phases, ranging between 6.9 and 7.8 in Phase 2, and 7.0 and 8.1 in Phase 3. Nigerian respondents had the lowest scores of the three countries for the full scale and the subscales (ranging from 4.6 and 5.4 in Phase 2, and 4.4 and 5.4 in Phase 3), while Bolivian respondents were in the middle (ranging from 5.7 and 6.3 in Phase 2, and 5.8 and 6.3 in Phase 3). Comparing the three subscale scores, we see that the “Access to information and care” subscale score is consistently the lowest for Bolivian and Nepalese respondents in both phases,

while this same subscale score is the highest for Nigerian respondents in both phases.

Construct and concurrent validity measures of PASE scale

Measures for evaluating construct validity were positively associated with PASES total scores among Phase 3 respondents. T-test results show that respondents who responded affirmatively on each of the three abortion knowledge questions – women who reported knowing safe ways to have an abortion (6.9 vs 5.3, $t = -12.37$, $p < 0.0001$), women who reported knowing where to get information about safe abortion (6.8 vs 4.9, $t = -13.87$, $p < 0.0001$), and women who reported knowing where to get a safe abortion (6.9 vs 5.1, $t = -12.89$, $p < 0.0001$) – had higher PASES scores. Similarly, for each of the five vicarious experience measures, t-test results show that respondents who reported vicarious experiences of abortion had higher PASES scores. Women who knew someone close to them who had a safe abortion (6.6 vs 5.4, $t = -8.7$, $p < 0.0001$), women who knew other women who have had a safe abortion (6.7 vs 5.4, $t = -9.35$, $p < 0.0001$), women who had helped someone seek information about abortion (7.3 vs 5.5, $t = -13.87$, $p < 0.0001$), women who had helped someone seek abortion services (7.4 vs 5.7, $t = -12.48$, $p < 0.0001$), and women who had accompanied someone during an abortion (7.4 vs 5.9, $t = 10.02$, $p < 0.0001$) all had significantly higher PASES scores. The persuasion measure also showed that women who had heard or seen positive messages about safe abortion in their community also had higher scores (7.2 vs 5.5, $t = -13.46$, $p < 0.0001$). Lastly, the personal experience measure showed that women who reported having had an abortion had higher scores (6.7 vs 6.0, $t = -4.70$, $p < 0.0001$).

Table 2. Results of exploratory factor analyses for perceived abortion self-efficacy scale (n = 1096, Phase 2 sample)

Item	Factor Loadings			Uniqueness
	Enlisting social resources	Accessing information and care	Resilience	
Ask someone close to you to accompany you during an abortion?	0.7712	−0.0971	0.1544	0.3345
Ask someone you trust for information on safe abortion?	0.7401	0.2009	−0.0522	0.281
Talk to someone close to you who will support you after an abortion?	0.7241	0.2046	−0.0437	0.2933
Ask someone to help you pay for the cost of a safe abortion?	0.6479	0.0944	0.0395	0.4533
Ask for advice from someone you know who has had a safe abortion?	0.604	0.1188	0.1225	0.3998
Talk with someone close to you about having an abortion?	0.5891	−0.0252	0.2256	0.457
Find someone to provide you with a safe abortion?	0.1349	0.7919	−0.0474	0.2716
Get a safe abortion without other people finding out?	−0.1055	0.7181	0.0537	0.5255
Get the information you need about safe abortion services or methods?	0.1745	0.6225	0.1238	0.2999
Pay for the cost of a safe abortion?	0.1311	0.5873	0.1191	0.4144
Get a safe abortion from someone that will not take advantage of you?	0.2691	0.5663	0.0094	0.4004
Get a safe abortion even if people close to you do not support your decision?	−0.0043	0.5352	0.2724	0.4561
Stand up for yourself if people find out about your abortion and treat you poorly?	0.0117	−0.0094	0.8923	0.201
Deal with any judgement from other people?	0.0843	0.023	0.8096	0.2228
Deal with people gossiping about you if they find out about your abortion?	0.0603	0.2113	0.6525	0.2815

In Table 6, unadjusted and adjusted regression results show that PASES scores were positively associated with each construct validity measure. Women responding affirmatively to each abortion knowledge,

vicarious experience, personal experience, and persuasion measure were between two and three times more likely to have a high PASES score (6 or higher) compared to a low PASES score (below 6).

Table 3. Goodness-of-fit statistics for 3-factor, 15 item model, by country and aggregate (n = 1265, Phase 3 Sample)

Model	SB ¹ adjusted RMSEA ²	SRMR ³	SB adjusted CFI ⁴	Cronbach's Alpha
<i>Acceptability cut-offs</i>	<i><0.08</i>	<i><0.08</i>	<i>>0.90</i>	<i>>0.80</i>
Bolivia	0.060	0.068	0.930	0.9245
Nepal	0.048	0.062	0.952	0.9113
Nigeria	0.057	0.047	0.967	0.9565
Combined	0.058	0.060	0.958	0.948

¹SB = Satorra–Bentler adjustment for nonnormal data.²RMSEA = Root mean square error of approximation.³SRMR = Standardised root mean squared residuals.⁴CFI = Comparative fit index.**Table 4. Reliability coefficients for full scale and subscale, by country and combined (n = 1265, Phase 3 Sample)¹**

	Full scale	Subscales		
		Enlisting social resources	Accessing info and care	Resiliency
Bolivia	0.92	0.83	0.88	0.77
Nepal	0.91	0.85	0.81	0.94
Nigeria	0.96	0.91	0.94	0.94
Combined	0.95	0.91	0.90	0.90

¹Reliability coefficients are also known as Cronbach's Alpha.

Lastly, the measure of concurrent validity, whether the woman reported she could get an abortion if she wanted or needed one, was also positively associated with PASE scores. T-test results showed that women who reported she could get an abortion if she wanted or needed one had higher PASE scores (7.1 vs 4.5, $t = -18.93$, $p < 0.0001$). Unadjusted and adjusted regressions mirror this result. Women who reported being able to get an abortion if she wanted or needed one to be 5 times more likely to have a higher PASE score (6 or higher) compared to a low PASE score (under 6) after controlling for sociodemographic characteristics (aOR = 5.14, 95%CI:3.72, 7.11; $p < 0.0001$).

Unadjusted and adjusted logistic regressions of PASES scores and the construct and concurrent validity measures using the Phase 2 sample show similar results. All PASES scores were positively associated with each of the validity measures (data not shown). Additionally, Phase 2 and 3 samples were combined to assess the association of the construct and concurrent validity measures with high (scale score of 6 or higher) and low (scale score under 6) PASE scores for each country. Phase 2 and Phase 3 country samples were combined to have a more robust sample for the logistic regression models by country. Supplemental Table 1 displays the adjusted odds ratios after controlling for sociodemographic characteristics. Results by country

Table 5. Scores of the PASE scale and subscales, by country (Phase 2 and Phase 3 samples)

	Phase 2 Sample				Phase 3 Sample			
	Bolivia (n = 299)	Nepal (n = 397)	Nigeria (n = 400)	Total (n = 1,096) ¹	Bolivia (n = 432)	Nepal (n = 401)	Nigeria (n = 435)	Total (n = 1,268) ¹
Summed Score Mean (SD)								
Full scale (15 items) ^{***}	6.0 (2.0)	7.4 (2.0)	5.0 (2.4)	6.2 (2.4)	6.0 (2.1)	7.6 (1.7)	4.8 (2.7)	6.1 (2.5)
Enlisting social resources (6 items) ^{***}	6.2 (2.1)	7.8 (2.0)	4.6 (2.6)	6.2 (2.6)	6.1 (2.2)	8.1 (1.7)	4.4 (2.9)	6.1 (2.8)
Access to information & care (6 items) ^{***}	5.7 (2.3)	6.9 (2.3)	5.4 (2.7)	6.1 (2.5)	5.8 (2.4)	7.0 (2.0)	5.4 (3.0)	6.0 (2.6)
Resilience (3 items) ^{***}	6.3 (2.5)	7.4 (2.4)	5.0 (3.0)	6.2 (2.9)	6.3 (2.4)	7.8 (2.0)	4.7 (3.4)	6.2 (3.0)
¹ Across both Phase 2 and 3, a total of 16 women were excluded from this table because they did not answer at least one of the final 15 PASE scale items. Kruskal–Wallis equality of populations rank test was used. ^{***} $p < 0.001$.								

show similar results as Table 6. All associations across all the validity measures – construct and concurrent – hold true for women in Nigeria. In Bolivia, all but one construct validity measure – verbal persuasion – hold true for women in Bolivia. In Nepal, all but two construct validity measures – verbal persuasion and personal experience – hold true for women in Nepal.

Discussion

The newly developed 15-item scale of perceived abortion self-efficacy is a promising tool to measure an individual's perceived confidence in their ability to carry out the tasks necessary to end a pregnancy safely and successfully. The scale can be used to measure perceived abortion self-efficacy across a wide range of types of abortion care – from abortion care received in a clinic or hospital setting to self-managed abortion, as respondents self-define “abortion care” when completing the scale. The scale consists of three underlying domains: enlisting social resources, access to information and care, and resilience.

The enlisting social resources domain relates to a person's confidence in asking for various types of support, including informational, emotional, and financial. The accessing information and care domain is related to a person's confidence in getting safe and accurate abortion information and care. Lastly, the resilience domain relates to a person's confidence in their ability to be resilient in the face of abortion stigma.

The factor analysis results demonstrate promising internal validity as shown by Cronbach's alpha. Additionally, the associations with measures of abortion knowledge and experience suggest strong construct validity. As hypothesised, women reporting having knowledge about abortion was associated with higher PASE scores. Previous abortion-related experience was associated with higher PASE scores. This finding supports Bandura's theory of self-efficacy¹ that people who have seen other people successfully perform a behaviour, vicarious experience, will have higher self-efficacy for performing the behaviour themselves. Additionally, previously performing a behaviour, personal accomplishment, will have

Table 6. Associations of Perceived Abortion Self Efficacy Scale (PASE) score with construct and concurrent validity measures, Phase 3 Sample ($n = 1265$)¹

	High PASES Score (≥6) n = 729	Low PASES Score (<6) n = 536	PASE Scale Score		Model n ³
			Unadjusted OR (95% CI)	Adjusted OR ² (95% CI)	
Construct Validity Measures: Abortion Knowledge					
% Knows safe ways to have an abortion.	62%	36%	2.9 (2.3, 3.7)***	2.9 (2.2, 3.7)***	1265
% Knows where to get information about safe abortion.	75%	47%	3.4 (2.7, 4.3)***	2.47 (1.9, 3.3)***	1265
% Knows where to get a safe abortion.	68%	42%	2.9 (2.3, 3.7)***	2.0 (1.5, 2.7)***	1264
Construct Validity Measures: Vicarious Experience					
% Knows someone close to you who has had a safe abortion.	64%	45%	2.2 (1.8, 2.8)***	2.0 (1.5, 2.6)***	1263
% Knows other women who have had a safe abortion.	66%	43%	2.5 (2.0, 3.2)***	2.2 (1.7, 2.8)***	1264
% Has helped someone seeking information about abortion.	44%	19%	3.4 (2.6, 4.4)***	3.3 (2.5, 4.4)***	1264
% Has helped someone seeking abortion services.	67%	33%	3.4 (2.5, 4.5)***	3.1 (2.2, 4.3)***	1265
% Has accompanied someone during an abortion.	22%	10%	2.5 (1.8, 3.5)***	2.6 (1.8, 3.9)***	1263
Construct Validity Measures: Persuasion					
% Has heard or seen positive messages about safe abortion where she lives.	47%	20%	3.4 (2.7, 4.4)***	1.7 (1.3, 2.3)**	1264
Construct Validity Measures: Personal Experience					
% Has had an abortion.	21%	16%	1.4 (1.1, 1.9)*	1.9 (1.3, 2.8)***	1261
Concurrent Validity Measure					
% Reporting she could get an abortion if she wanted one.	80%	40%	5.9 (4.6, 7.6)***	5.1 (3.7, 7.1)***	1262

¹Three respondents from phase three who completed the survey skipped one or more of the final 15 items used in the PASE scale, reducing the total phase three sample presented in this table from 1268 to 1265.

²Adjusted for country, urban/rural, age (continuous), marital status, education and both subjective social status questions.

³Model N shows different values due to missing data in each of the validity measures.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. CI, confidence interval; OR, odds ratio.

higher self-efficacy for performing the same behaviour again. Lastly, the persuasion measure – having heard or seen positive messages about abortion – showed a positive association between women who had heard or seen positive messages about abortion with higher PASE scores. These associations were consistent for nearly all the construct validity measures when analysed by country. Concurrent validity was demonstrated by the strong association between whether a woman could get an abortion if she wanted or needed one and the PASE score, and this was also demonstrated in the country-level models.

Another strength of this study was the development of the scale using formative research with women across three diverse country settings and factor analysis using quantitative data across the same three locations. The development and validation of the scale included three different countries across three different continents with diverse abortion laws and policies. The differences in mean PASE scores in each study country mirror the restrictive setting of the abortion laws in each country. Nepal has the most liberal abortion law and the highest PASE scores while Nigeria has the most restrictive laws and the lowest PASE scores. In addition to the inclusion of three diverse study countries, the sampling included participants from both urban and rural settings in each selected state or district in each country. The purposeful sampling also varied across demographic characteristics – age, marital status, and education. This scale development and sampling approach suggests that the scale may be applicable to diverse populations across these varied sociodemographic characteristics.

However, a limitation of this study was the selection of states or districts with previous or current Ipas programming for recruitment in each country. These states or districts were selected because Ipas had familiarity and relationships with local partners that supported recruitment of women and girls for the IDIs and FGDs of the formative phase of this study. Given the selection of states or districts with previous or current Ipas programming in each country, the results may not be generalisable of the population of women and girls in each country. Research to test this PASE scale in other settings, including fielding the full scale and conducting factor analyses, would provide further evidence of the measure's validity.

Another limitation of this study is the lack of predictive validity measures – the degree to

which the PASE scale scores are correlated with variables measured at a later point in time. The data collected and analysed from Phase 2 and Phase 3 are cross-sectional and the study was not designed to test whether PASE predicts any behavioural outcome, such as accessing a safe abortion service. Estimating the predictive validity of the scale will add additional evidence to the validity of the scale.

Conclusion

In conclusion, the PASE scale shows considerable promise for measuring women's perceived abortion self-efficacy in a variety of settings. This PASE scale and subscale scores can be used as part of formative research to inform the design, content, and messaging of interventions intended to increase abortion self-efficacy. PASE tool can also be used to measure changes in perceived abortion self-efficacy over time. Additionally, PASE scores can be utilised to understand factors associated with perceived abortion self-efficacy or the effect of PASE on other behavioural outcomes.

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Disclosure statement

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Ethics approval

Ethical review and approval for this study was obtained from the Allendale Institutional Review Board in the United States, the Nepal Health Research Council and the National Health Research Ethics Committee of Nigeria.

Data availability and materials

The datasets generated or analysed during the current study are not publicly available because of the

sensitive nature of abortion in restrictive settings. However, data are available from the corresponding author, KMS, upon reasonable request.

Supplemental data

Supplemental data for this article can be accessed online at <https://doi.org/10.1080/26410397.2023.2240570>.

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Résumé

L'objectif de cette recherche était de mettre au point et d'évaluer la validité d'une échelle pour mesurer le sentiment d'auto-efficacité de l'avortement (*perceived abortion self-efficacy*/PASE). Le sentiment d'auto-efficacité de l'avortement est défini comme la confiance ressentie par un individu quant à sa capacité à mener à bien les tâches

Resumen

El objetivo de esta investigación era crear una escala para medir la autoeficacia percibida para el aborto (PASE, por sus siglas en inglés) y evaluar la validez de la escala. La autoeficacia percibida para el aborto se define como la confianza percibida de una persona en su capacidad para realizar las tareas necesarias para interrumpir un

nécessaires pour interrompre une grossesse avec succès et en toute sécurité. Au cours de la première phase de cette étude, entre février et avril 2018 nous avons mené une recherche qualitative à l'aide d'entretiens approfondis et de discussions de groupe avec des femmes en Bolivie, au Népal et au Nigéria pour explorer les domaines du PASE. En utilisant les données qualitatives, nous avons préparé un projet d'ensemble de mesures avec 31 points. Entre octobre et novembre 2018, la deuxième phase de l'étude comprenait des essais sur le terrain des 31 points provisoires auprès d'un échantillon sélectionné par choix raisonné d'environ 1200 femmes dans les trois pays de l'étude. Une analyse factorielle exploratoire a été effectuée pour identifier une structure appropriée de l'échelle, aboutissant à un modèle à trois facteurs et 15 points. Les trois facteurs représentent les concepts de mobilisation des ressources sociales, d'accès à l'information et aux soins, et de résilience. Dans la troisième et dernière phase, entre septembre et octobre 2019, la validité des 15 points de l'échelle a été évaluée. L'échelle a été administrée à un nouvel échantillon de près de 400 femmes dans chaque pays. Des analyses factorielles de confirmation ont été réalisées pour tester l'adéquation du modèle à la structure de l'échelle identifiée lors de la deuxième phase. Les résultats de cette étude semblent indiquer que l'échelle finale PASE possède un potentiel considérable pour être une mesure valable de la PASE. La nouvelle échelle PASE en 15 points présentée dans cet article peut être utilisée pour évaluer des interventions ou des programmes conçus pour améliorer le PASE des femmes et pour évaluer l'état de la PASE dans les populations.

embarazo de manera segura y eficaz. Durante la primera fase de este estudio, Entre febrero y abril de 2018, realizamos una investigación cualitativa utilizando entrevistas a profundidad y discusiones en grupos focales con mujeres en Bolivia, Nepal y Nigeria para explorar las áreas de PASE. Utilizando los datos cualitativos, preparamos una serie de mediciones con 31 ítems preliminares. La segunda fase del estudio de octubre a noviembre de 2018 consistió en realizar una prueba de campo de los 31 ítems preliminares con una muestra de conveniencia de aproximadamente 1200 mujeres en los tres países donde se llevó a cabo el estudio. Se realizó un análisis factorial exploratorio para identificar una estructura de escala adecuada, que produjo un modelo de 3 factores con 15 ítems. Los tres factores representan los conceptos de obtener recursos sociales, acceder a información y servicios, y tener resiliencia. En la tercera y última fase, de septiembre a octubre de 2019, se evaluó la validez de los 15 ítems de la escala. La escala fue administrada a una nueva muestra de aproximadamente 400 mujeres en cada país. Se realizaron análisis factoriales confirmatorios para probar la idoneidad del modelo para la estructura de escala identificada durante la segunda fase. Los resultados de este estudio indican que la escala final de PASE tiene considerable potencial de ser una medida válida de PASE. La nueva escala de PASE con 15 ítems presentada en este artículo puede utilizarse para evaluar programas o intervenciones diseñados para mejorar la PASE de las mujeres y para evaluar el estado de PASE en las poblaciones.