

"I Can See She Does Not Want to be Pregnant":
Using Images to Inform Low-Literacy Audiences
About Safe Abortion in Zambia

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ABSTRACT

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(under the direction of Jane D. Brown, Ph.D.)

Images are often perceived as a universal language, but when communicating health messages, lack of specificity can lead to misinterpretations with potentially dangerous consequences. This study evaluates the image-based *Ending Pregnancy with Pills* booklet in Lusaka, Zambia. Think-aloud interviews were conducted with 20 low-literate women to determine how they interpreted the health messages and clinical information contained in the booklet. Analysis focused on visual techniques and structures that helped or hindered accurate understanding of the intended message. Culturally-based visual conventions, such as thought balloons, that required symbolic interpretation strategies, contributed to misunderstanding. Iconic strategies, such as the sun and moon, to convey the passage of time increased comprehension. Recommendations for health practitioners developing image-based materials are discussed.

DEDICATION

To Ben—Thank you for taking care me so I could take care of this.

To my family—Thank you for always supporting and encouraging me.

Much love, Andi

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TABLE OF CONTENTS

List of Tables.....	vii
List of Figures.....	viii
Chapter	
1. Introduction.....	1
Background.....	1
Theoretical Background and Previous Research.....	2
Research Questions.....	18
2. Methods.....	19
Participants.....	21
Analysis.....	23
3. Findings.....	24
Making an Informed Decision: Pages 2-4.....	24
Taking the Pills: Pages 6-8.....	33
Monitoring for Dangerous Side Effects: Pages 9-13.....	42
Preventing Another Unwanted Pregnancy: Page 15.....	51
Overall Understanding of the Booklet.....	54
Attitudes Towards Abortion in Zambia.....	59
Participants' Suggestions.....	63
4. Discussion and Conclusion.....	64
Implications for Theory.....	66
Implications for Practitioners.....	69

Limitations.....	71
Directions for Future Research	73
Conclusion.....	74
Appendices.....	75
<i>A: Ending Pregnancy with Pills</i> Booklet.....	75
B: Interview Guide.....	84
C: Participant Demographic Information.....	89
References.....	90

LIST OF TABLES

Table 1: Strategies used to depict motion and the associated classification of images and interpretive strategies required	5
Table 2: Breast tenderness illustration responses.....	27
Table 3: Participants' responses to exclamation point symbol	43
Table 4: Description of the woman's condition on page 11.....	49
Table 5: Participants' responses to diaphragm and contraceptive patch illustrations.....	53

LIST OF FIGURES

Figure 1: Time sequence from page 11 of the <i>Ending Pregnancy with Pills</i> booklet	3
Figure 2: Image of boy playing soccer.....	6
Figure 3: Map of Southern Africa	20
Figure 4: Map of research sites in Lusaka	20
Figure 5: Demographic description of the 20 participants	22
Figure 6: Page 2 of the <i>Ending Pregnancy with Pills</i> booklet.....	26
Figure 7: Page 3 of the <i>Ending Pregnancy with Pills</i> booklet.....	28
Figure 8: Page 4 of the <i>Ending Pregnancy with Pills</i> booklet	30
Figure 9: Main character's expressions from pages 2-4.....	32
Figure 10: Page 6 of the <i>Ending Pregnancy with Pills</i> booklet	33
Figure 11: Page 7 of the <i>Ending Pregnancy with Pills</i> booklet.....	36
Figure 12: Page 8 of the <i>Ending Pregnancy with Pills</i> booklet.....	39
Figure 13: Time of day segment from first scene, page 8.....	39
Figure 14: Blood flow diagram from first scene, page 8.....	39
Figure 15: Exclamation mark symbol.....	42
Figure 16: Page 9 of the <i>Ending Pregnancy with Pills</i> booklet.....	44
Figure 17: Page 10 of the <i>Ending Pregnancy with Pills</i> booklet.....	46
Figure 18: Page 11 of the <i>Ending Pregnancy with Pills</i> booklet.....	49
Figure 19: Page 12 of the <i>Ending Pregnancy with Pills</i> booklet.....	50
Figure 20: Page 13 of the <i>Ending Pregnancy with Pills</i> booklet.....	51
Figure 21: Page 15 of the <i>Ending Pregnancy with Pills</i> booklet.....	52
Figure 22: Detail of contraceptives illustration from page 15.....	52
Figure 23: Detail of pregnancy symptom illustrations, page 2.....	68

CHAPTER 1

Introduction

Background

Unsafe abortion is an often overlooked cause of maternal mortality. The World Health Organization estimates that 66,500 women die each year from unsafe abortion procedures worldwide, and another five million suffer from potentially-debilitating injuries (World Health Organization [WHO], 2007). The problem is particularly acute in eastern Africa where 17% of all maternal deaths are attributed to unsafe abortion (WHO, 2007).

Despite having a liberal abortion law (Guttmacher Institute, 2009), Zambian women are still dying as a result of clandestine procedures. Stigma surrounding abortion makes exact numbers difficult to obtain, but estimates suggest it could account for as much as 30% of all maternal deaths (Likwa et al., 1996). The Zambian Ministry of Health is committed to reducing the number of women who suffer and die needlessly and is pursuing programs to make safe abortions services more widely available (Zulu, 2009).

Ipas, a non-governmental organization, is a partner in those efforts. Founded in 1973, Ipas works internationally to prevent death and injury from unsafe abortion and to promote access to safe, respectful abortion procedures ("Who we are," n.d.).

The *Ending Pregnancy with Pills* booklet (see Appendix A) was developed by Ipas to aid women who have low literacy skills terminate unwanted pregnancies safely. This study will evaluate the publication in a Zambian context, determining if the clinical information it contains is understood enough by women to ensure a safe abortion procedure.

Low literacy rates in Zambia¹, and Ipas's commitment to reaching women directly,

¹ 61.0% for women in 2008, Europa World Online, 2008

create a need for materials that rely on images for communication. While guidelines exist for creating low-literacy publications, most of these focus on making written language more accessible and are inappropriate in a context where many women have little formal education.

Theoretical Background and Previous Research

Relying solely on images for communication presents potential pitfalls, however. The audience must interpret the visual materials presented to them based on personal experience, knowledge, and their own cultural context (Houts et al., 2006). Without words to clarify meaning, visual publications can invite misinterpretation that, especially for medical information, can have serious consequences.

Creators of visual communication materials draw on visual conventions to denote specific information to their audiences. These conventions are created through the shared learning or experiences of a discourse community (Kostelnick & Hassett, 2003). The danger of misinterpretation grows when attempting, intentionally or unintentionally, to use the conventions of one discourse community with another. This happens frequently because, as Kostelnick and Hassett (2003) point out, conventions are invisible. "... they [visual conventions] are socially constructed within discourse communities, a process that validates and sustains them but that also conceals their artificiality by making them appear natural" (p.31).

For example, Nidadavolu and Bracken (2006) found that villagers in a rural area of the Indian state of Rajasthan, recognized and understood images of houses drawn in a flat perspective more readily than in three-dimensional perspective. The map-like drawings that were eventually used in the publications they developed were more familiar to the population they were trying to communicate with, and therefore, were more meaningful.

Looking at the *Ending Pregnancy with Pills* booklet with a critical eye reveals many visual conventions—such as thought balloons or the use of arrows to symbolize the passage of time—that may or may not be understood by the Zambian population that Ipas intended

to reach. This study examined those conventions in context, asking women to comment on them and noting their levels of understanding.

Hoogwegt, Maes and van Wijk (2009) identified two strategies for depicting motion in static images: iconic and extra-pictorial. Iconic strategies use visuals that “literally/ analogously represent elements in the outside world” (p.279). For example, an image using an iconic strategy to illustrate a person running would show a figure with legs bent. Iconic strategies “rely on knowledge of events happening every day, and experiences with what things look like in an everyday world” (p.279).

Extra-pictorial strategies rely on non-iconic elements, arrows for example, layered over iconic elements to imply motion. Some of these non-iconic elements may draw on experiential knowledge or metaphor, but many are entirely based in arbitrary conventions (e.g., an arrow denotes movement) (Hoogwegt et al., 2009, p.279).

These strategies can also be applied to depicting the passage of time in static images. For example, this section from page 11 of the Ipas booklet (see Figure 1) illustrates the passage of time using both strategies. The sun and moon elements are an iconic approach; they relate the passage of time based on everyday experience and observation. The arrows are an example of an extra-pictorial strategy.

In Figure 1 the larger image contains several smaller scenes arranged sequentially to imply a narrative. This strategy is similar to the use of panels in comics (McCloud, 1993),

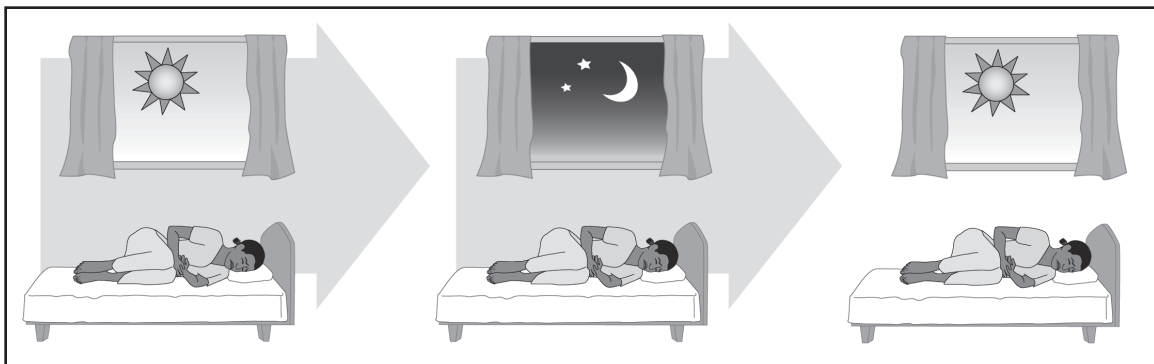


Figure 1: Time sequence from page 11 of the *Ending Pregnancy with Pills* booklet

however, the scenes that make up page 11 are not delineated by panel borders as they would be in a comic book. The lack of panel borders may create uncertainty about how to interpret the image.

Maes, Foeselek and Hoogwegt (2008) offer an interpretive framework for viewing images, drawing on Keller's (1998) idea that a sign system is not "to be seen as a collection of signs, but as a collection of interpretation techniques allowing communicators to make sense or meaning out of these signs" (p.158). They suggest that viewers use three different interpretive strategies to understand health-related visual messages, based on the classic semiotic image classifications of index, icon and symbol.

An indexical image, or signifier, has a non-arbitrary physical or causal relationship with the signified (Hall, 2007). For example, fire causes smoke, therefore smoke is an index of fire. Maes et al., (2008) describe the interpretation strategy used to understand this relationship as symptomatic. A viewer seeing an image of someone smiling will interpret that person as feeling happy because a smiling facial expression is an index of happiness.

A second interpretive strategy is based on the idea of iconic images, where the signifier resembles the signified in some way (Hall, 2007). For example, a drawing of a pill container is the signifier that closely resembles the actual object, the real pill container that is the signified.

The third interpretive strategy defined by Maes et al. (2008) is used to interpret symbolic images, which are images for which the relationship between the signifier and the signified is arbitrary (Hall, 2007). An example of a common symbolic image is a logo. No concrete relationship exists between most logos and the product or company they represent. To create meaning from a symbolic image, the viewer must be familiar with the conventional, assigned meaning. These meanings are often dependent on the community or culture within which they are used (Maes et al., 2008). Symbolic interpretive strategies often demand more abstract thinking on the part of viewer.

In addition to symbols, community- or culturally-based knowledge can influence an individual's interpretation of iconic and indexical images as well, especially if the images depict objects or situations with which the individual is unfamiliar. Hoogwegt et al. (2009) discuss iconic strategies for depicting motion as relying on experiential knowledge. If a viewer does not possess the everyday knowledge, learned through experience, then he or she is ill-equipped to interpret that visual strategy in the way the creator of that image intended.

Table 1: Strategies used to depict motion and the associated classification of images and interpretive strategies required

Strategy chosen by the creator of the image	Type of image used	Interpretive strategy required of viewer
<i>From Hoogwegt et al. (2009)</i>	<i>From Semiotic theory</i>	<i>From Maes et al. (2008)</i>
	Index	Symptomatic
Iconic	Icon	Iconic
Extra-pictorial	Symbol	Symbolic

The strategies for depicting motion outlined by Hoogwegt et al. (2009)—iconic and extra-pictorial—are choices made by the creator of the image. He or she makes the decision about what type of image—index, icon or symbol—to use to convey the intended idea. Hoogwegt et al.'s iconic strategy primarily uses images that fit into the semiotic category of icon. Images using the extra-pictorial strategy tend to use elements that would be classified as symbols. The different types of images require the viewer to use different interpretive approaches, as described by Maes et al. (2008). Table 1 shows the associations between the different strategies chosen by the creator, the types of images used and the interpretation strategy required of the viewer.

Hoogwegt et al. (2009) does not address the possibility of using index images for indicating motion. It may be possible to create an image that is an index of motion, but since static images do not include a time-based element, it would be difficult. A possible example would be the use of footprints, however, this could also be viewed as a symbolic image,

depending on how the footsteps were depicted. Photographs of footprints left in mud may qualify as an index, where an illustration of stylized footsteps could be considered a symbol.

Figure 2, from Brouwer (1995), provides a similar example of an illustration that does not fit neatly into the categories offered by Maes et al. (2008) and Hoogwegt et al. (2009). While the choice to depict motion through the boy's posture and leg position would seem to be an iconic strategy, the aesthetic choice to use a foreshortened style requires the viewer to recognize the different leg positions that occur when a person is running. Someone who has not seen a stop motion photograph of a person running might not be familiar with this convention. Brouwer (1995) reports that this image was frequently interpreted as representing an amputee by rural villagers in South Africa.

Müller (2008) discusses the issues created when visuals are de-contextualized from the context in which they were created, and re-contextualized into a culture or community that is not familiar with the original production context. This re-contextualization fosters meaning transformation and the potential for misunderstanding. The interpretive



Figure 2: Image of boy playing soccer, developed by Groupe de Recherche et d'Appui l'Autopromotion Paysanne (GRAAP) (Brouwer, 1995, p.20)

strategies—symptomatic, iconic and symbolic—discussed by Maes et al. (2008) can still be applied by viewers but without experiential knowledge of the original context, meaning can vary vastly from what the creator intended. Griffin (2008) describes this same

transformation process and attributes it to the “level of familiarity with cultural symbols and systems of meaning” (p.119) that influence the viewer’s interpretation of an image.

Kostelnick and Hassett (2003) use the term visual convention to describe a concept similar to the cultural systems of meaning that Griffin discusses. They view conventions as a visual codes or shorthand defined through a “community of use” that, either formally or informally, define the meaning for a particular visual element. Because they are social constructs, visual conventions are vulnerable to change, especially those used by large, loosely-defined communities. Visual conventions tend to be “naturalized” and hence, not recognized as a constructed convention (p.31).

Thus, a number of theoretical perspectives suggest that understanding visual messages is a complex task, requiring cultural knowledge of visual conventions and familiarity with the interpretive skills required. Viewers must be able to recognize the images they are interpreting and apply appropriate strategies to make meaning. Re-contextualization of an image beyond the context of its creation increases the likelihood that the meaning ascribed by the viewer will not match the meaning intended by the creator.

Image information processing.

Information processing includes at least three steps: comprehension, recall and adherence (Houts et al., 2006). In a literature review conducted by Houts et al. (2006), six studies were found that addressed the effects of images on comprehension. Two were beyond the scope of this literature review—one because the primary audience was children, the other because it compared comprehension between video content and written content. The other four studies reviewed by Houts et al. (2006) found that images did improve participants’ comprehension of health information. Notably, studies by Michieulette et al. (1992) and Austin et al. (1995) found that the inclusion of images had a greater effect on the comprehension scores of participants with lower literacy levels than participants with higher literacy levels. In contrast, Davis et al. (1996) found that simplified language was more effective with high literacy groups than low literacy groups.

These findings suggest that images are a more effective strategy than simplified language for increasing comprehension in low literacy audiences. Ngoh and Shepherd (1997) also found that the use of visual aids improved comprehension in their study of prescription medication adherence with rural Cameroonian women. Experimental groups that received visual aids alone or visual aids in conjunction with an organizing tool did significantly better on the post-test and the follow-up test than the control group, who received no information beyond the usual oral instructions given by a medical provider (Ngoh & Sheperd, 1997).

Images have also been shown to increase recall rates, particularly when paired with additional information presented aurally. Houts et al. (2006) divided studies on the effect of images on recall into two groups: those testing unassisted or free recall, and those that used visual aids as a reminder or cued recall. The five free recall studies reviewed had mixed results. Three found higher recall when images were present, one found no statistical difference, and two actually found a decrease in some groups. The study by Morrell et al. (1990) attributed the decrease in free recall to the age of the population studied; they determined that the images actually served as a distraction for the elderly group.

The positive effect of images on cued recall is more strongly supported in health communications research, especially in conjunction with aural information, a popular strategy used with low literacy audiences. Houts et al. (1998) found that college students recalled only 14% of the information that was presented aurally, compared to 85% when pictures were combined with audio. In a 2001 follow-up study, Houts et al. (2001) recruited low-literacy adults and expanded the number of visual cues tested. The goal was to replicate the type of instructions that an individual would need to recall to care for someone with a serious illness at home. The immediate recall rate was 91%, similar to that found in the 1998 study with college students. The long-term recall rate was 71% (Houts et al., 2001).

Dowse and Elhers (2005) also recommended combining audio and visual channels, although they suggested using interpersonal methods such as individual counseling for

pharmaceutical instructions. Their study examined the use of pictograms for conveying medication instructions to a non-literate population in rural South Africa. Printed words could not be used to supplement the pictograms, as they would not be understood by the target population. They suggest that in-person counseling, in addition to providing potential recall benefits, could guard against the possibility of misinterpreting images.

Behavioral outcomes.

Increases in comprehension and recall are beneficial but they do not automatically equate with measureable behavioral outcomes, which is ultimately the goal of most health communication. It is difficult to link any specific communication with behavior change, but Houts et al. (2006) found two studies that tied the use of images to adherence to the health behavior described. The study by Delp and Jones (1996) compared two groups of patients seen for lacerations at a hospital emergency room. One group was given a sheet of written instructions on wound care prior to discharge; the other group was given the same information accompanied by cartoon illustrations. Three days after discharge, both groups were surveyed about their compliance with the instructions. The group that received the illustrated instructions was more likely to have read and followed the directions. They were also more satisfied with the instructions given. Ngoh and Shepherd's (1997) study with Cameroonian women also found a link between visual materials and behavior. The groups that received the illustrated medicine schedule were more likely than the group that received only aural information to have complied with the instructions.

The use of images in health communication has been shown to increase comprehension and cued recall. While there is not as much evidence supporting the connection between images and behavior change, findings by Ngoh and Shepherd (1997) and Delp and Jones (1996) suggest a relationship.

Image tailoring.

The positive findings about the use of images are belied by the potential for misunderstanding if the images are not carefully tailored to the target audience. When

communicating health information, misunderstandings can be dangerous. Dowse (2004), examining the use of pictograms for medication instructions, found that patients—particularly those lacking the visual literacy skills learned from frequent media exposure—did not correctly interpret the images presented to them. In this context, misinterpretation can have serious consequences for the patients' health.

Roberts et al. (2009) showed a pictorial asthma management plan to groups in both the United Kingdom and Malaysia. They compared the interpretations made by the groups using two scales: guessability and translucency. Guessability was measured by asking participants to write one or two words about what they thought each image meant. Translucency was assessed by asking participants how well they thought the image matched its intended meaning as provided by the researchers. The pictograms with the most misinterpretations or that were judged to be most confusing, scored the lowest. The pictograms designed to illustrate repetition and those that included UK traffic signs, for example, were low in guessability and translucency, for study participants not familiar with British culture.

Cultural factors.

Roberts et al. (2009) encountered several culturally-based obstacles in testing their pictorial asthma action plans. Their participant groups were drawn from three different cultural backgrounds: one from London, one of Somali immigrants living in Manchester, and one in Malaysia. They found that there were cultural differences in recognizing the inhalers, due to different packaging conventions in different countries. The Malaysian group did not understand symbols based on traffic signs. This could be attributed to the fact that none of the group drove.

Because images depend on cultural associations, the context within which the images are made and the context within which the images are viewed are both important.

Dowse and Elhers (2005) compared sets of pictograms designed to illustrate how to take medication. One set was developed in the United States and was intended to be a universal standard; the other set was adapted to the local South African culture. Overall, they found

that the local pictograms were preferred over the universal ones, and were understood correctly by a greater number of participants. Levie (1987) summarized the importance of culturally-appropriate images, and the problem with so-called universal symbol sets:

Because we acquire our ability to interpret pictures largely without intent or awareness, we may be misled into supposing that our mode of picturing is truly the universal language. In fact, pictures are heavily laden with culture-bound conventions that must be learned if they are to be understood. (p.8)

To avoid problems such as the ones previously documented, Ngoh and Shepherd (1997) extensively pretested their materials to ensure they were understood by the cultural group with which they were working. Their materials, illustrated schedules developed to assist non-literate women in rural Cameroon in taking medications, were developed in conjunction with a local artist. Several rounds of pretesting and refinement were used to create the final materials that were tested in a field experiment. The choice to use a local artist is particularly interesting as it increased the possibility that the aesthetics of the resulting images would be familiar to the population receiving them.

The detailed approach to the development of educational materials used by Ngoh and Shepherd (1997) resulted in a measurably successful intervention. Both groups who received the materials showed significantly higher scores on a comprehension post-test than the control group. The experimental groups also had significantly better scores on measures of compliance to the prescribed medication regimen.

Aesthetic factors.

Aesthetics also can influence an audience's understanding and acceptance of the information presented. Several studies have examined the effect that different styles of images had on comprehension. In a study comparing the effect of different image styles on comprehension of an educational booklet by osteoarthritis patients, Moll (1986) found that cartoon images were linked with the greatest increase in comprehension. The participants indicated, however, that they preferred the photographic style the most.

In their meta-analysis of studies examining the effect of pictures on reading comprehension, Readance and Moore (1981) found that line drawings had a greater impact on comprehension than photographs. They did not comment on the potential implications of this result, but Houts et al. (2006), in their review of the study, attributed this difference to the ability of line drawings to reduce distracting details. Dowse (2004) agreed, noting the tendency of individuals with low literacy skills to focus on irrelevant details: “Those with less developed visual-literacy skills tend to hone in on one detail and describe it, and appear reluctant to let their attention venture elsewhere in the image” (p.24). Her observations suggest that simple images such as line drawings or cartoons would be most effective with less literate audiences.

The over-simplification of images into graphic symbols may also be problematic. One area of scholarly debate is whether images need to be immediately recognizable to be effective with low literacy populations or if a system of learned symbols can be used. Dowse and Ehlers (2005) argued that the visual literacy of the audience—their familiarity with decoding images—is an important factor when deciding between the two approaches.

Houts et al. (2001) represent the other end of the spectrum. The system of pictograms they developed was clearly a system that had to be learned. It included 236 different images and required participants to learn 29 visual conventions during the course of the initial interview. The conventions included abstract visualizations such as “a blue arrow represents time passing” and “red lightening bolts represent pain” (Houts et al., 2001, p.235). Dowse (2004) would disagree with the Houts approach. Dowse noted that poor readers tend to interpret images literally and become confused when presented with abstractions. Dowse also recommended avoiding complex conventions:

Skilled readers systematically scan a visual to find the central concept and quickly identify the principal features. On the other hand, the eyes of poor readers wander about the page randomly without finding the central focus of the visual, and they tend to miss the main message. (Dowse, 2004, p.24)

In sum, aesthetic factors can influence the interpretation of an image. Line drawings and other simplified styles eliminate unnecessary details that viewers with low literacy skills may find distracting. A simple style can help keep a viewer's focus on the image's main message. However, eliminating too many details can result in an image that is unrecognizable. Image creators must be careful to find the correct balance.

Communication for social change.

The *Ending Pregnancy with Pills* booklet, as part of larger efforts by the Zambian Ministry of Health and international non-governmental organizations to reduce Zambia's maternal mortality rate, is an example of development communication or communication for social change. Current academic discourse on communication for social change focuses on the participatory paradigm (Waisbord, 2008), with roots in the work of Brazilian educator Paulo Freire. The participatory paradigm emphasizes decentralized planning and the full involvement of the people at a grassroots level, ensuring that everyone benefits from social and economic improvements, not just the elites (Melkote & Steeves, 2001).

Freire's vision of the participatory paradigm, established in *Pedagogy of the Oppressed* (1970), emphasized the need for social change to arise from the empowerment of oppressed communities. He critiqued education systems that follow a "banking concept" of education that serves, not to empower individuals, but to reinforce traditional sources of authority. Banking education does not teach students how to reflect critically on their world, but instead, conditions them to blindly accept present conditions.

According to Freire (1970), for authentic social change to occur, oppressed people need to achieve critical consciousness through "problem-posing" education that encourages dialogue and reflection. Critical reflection, combined with action, results in praxis that can transform the world.

The *Ending Pregnancy with Pills* booklet, as a communication for social change project, must overcome many of the obstacles that Freire mentions. The women who are the

intended audience for the booklet have been denied full access to education and taught to discount their knowledge and insights.

Abortion in Zambia.

Zambia's abortion law, passed in 1972, allows broad legal access to abortion, compared to other countries in the region. A legal abortion may be obtained in Zambia if continuing the pregnancy poses:

- (i) risk to the life of the pregnant woman; or
- (ii) risk of injury to the physical or mental health of the pregnant woman; or
- (iii) risk of injury to the physical or mental health of any existing children of the pregnant woman;...
- (b) that there is a substantial risk that if the child were born it would suffer from such physical or mental abnormalities as to be seriously handicapped. (Termination of Pregnancy Act, 1972)

The code was amended in 2005 to specifically include rape as a legal reason for seeking an abortion and to exclude girls who have been raped from being persecuted for attempting to abort on their own (Ministry of Health [MOH], 2009).

Approval for the procedure must be obtained from three doctors. That provision causes difficulty, especially in the rural regions of the country where few doctors are available (Koster-Oyekan, 1998). In emergencies, where the woman's life or health is in danger, the requirement may be waived (Termination of Pregnancy Act, 1972).

In 2009, the Zambian Ministry of Health issued new guidelines aimed at reducing the number of unsafe abortions. The document stressed increased access to family planning methods as a way of avoiding unwanted pregnancies and addressed the need for easier access to safe termination procedures for women who need them. The ultimate goal was to lower Zambia's maternal mortality rate to meet Millennium Development Goal 5 (MOH, 2009).

The interpretation of the 1972 Termination of Pregnancy act set forth in the

new guidelines expanded the definition of qualified health provider to include nurse practitioners and midwives (MOH, 2009). This change allows nurse practitioners and midwives to provide abortion procedures, a key step in addressing the shortage of doctors (IRIN, 2010).

Despite government efforts to increase access to safe abortion services, many women still resort to clandestine procedures. Dahlbäck, Maimbolwa, Yamba, Kasonka, Bergström and Ransjö-Arvidson (2010) examined young women's abortion experiences in Lusaka. None of the 32 women included in the study who had induced abortions knew the current law or that a safe, legal abortion was an option for them. The most commonly cited reason for seeking the procedure was the desire to continue schooling. In Zambia, it is common for young women to be expelled from school if they are discovered to be pregnant (Koster-Oyekan, 1998). Financial hardship and the stigma of being an unmarried mother were also frequently mentioned (Dahlback et al., 2010).

Stigma heavily influences the decisions of older women as well. The large Roman Catholic population, as well as the evangelical Christian denominations experiencing rapid growth in the country (Europa, 2011), condemn abortion, socially isolating women who seek the procedure (IRIN, 2010). Traditional beliefs also ostracize those who have aborted. Koster-Oyekan (1998) explained that traditional taboos surrounding abortion—both induced and spontaneous—still influence Zambian society. In some traditional villages, women who have aborted must stay in a hut outside the village, isolated from society, until bleeding stops and a cleansing ritual can be performed. Some believe that women who have aborted will be punished with tuberculosis, which they will spread to all those they come into contact with (Koster-Oyekan, 1998).

The stigmas present in Zambian society also influence the medical professionals who provide abortion services. Some counselors will try to persuade women to keep their pregnancies (The Guardian, 2009). Some doctors and nurses will neglect patients as punishment (Muyuni, 2010). Many women refuse to seek safe abortion services because

they fear mistreatment or that the medical staff will break confidentiality and spread gossip in their communities (Koster-Oyekan, 1998).

The Ministry of Health has attempted to ease women's fears about confidentiality and disrespectful treatment through training programs for medical providers on abortion. The trainings emphasize respectful treatment and confidentiality (Muyuni, 2010).

In addition to the changes instituted in the Ministry of Health's new guidelines and training programs, Zambia has also taken steps to increase access through the approval of pill-based abortion procedures, also known as medical abortion. Because pill-based abortions do not require surgical equipment, they are easier to offer in low-resource settings. Pill-based abortions can be offered at a lower cost by lower-level medical providers, including nurses and midwives (Marie Stopes International (MSI) & Ipas, 2009).

The most effective medical abortion drug regimen includes two separate medications: mifepristone and misoprostol. Mifepristone, also known as RU-486, inhibits the effects of progesterone causing the pregnancy to detach from the lining of the uterus (Ipas, 2003, p.2). Misoprostol is then taken to induce contractions, expelling the pregnancy from the body (Ipas, 2003).

Medabon, which packages mifepristone and misoprostol together, is a generic medication developed to offer cost-effective solutions to developing countries. It was created by a partnership, led by the Concept Foundation, of nongovernmental and private sector organizations (Ministry of Foreign Affairs of the Netherlands, 2010). Medabon was approved for use in the Zambian Health System in 2010 ("Mifepristone approval," 2010).

The *Ending Pregnancy with Pills* booklet was created by Ipas to guide women who have chosen to terminate a pregnancy using Medabon. The initial idea behind the development of the booklet was to create materials that could be adapted by local offices and partner agencies in many different countries to meet the needs of local women. Producing materials is an intensive process requiring up-to-date clinical information in addition to

communication experience. Many local offices or smaller partner agencies do not have the capabilities to create these materials on their own.

Ipas offers the booklet as a starting point containing accurate clinical information that agencies can build upon. However, given the limitations that local agencies face, Ipas also wanted the booklet to be able to be used without adaption, if the resources were not available for those efforts. The need for the booklet to be usable “as is” in a wide range of settings guided the design process. For example, the main character’s clothing, hairstyle and skin color were chosen to blend in with the widest range of cultures possible.

The core concepts and clinical information were developed by the medical abortion team at Ipas. An agency with experience in cross-cultural visual communication—Kwikpoint—was hired to create the visual elements. A draft version of the booklet was produced and tested by Ipas offices in Nicaragua, Cambodia, Nepal and Pakistan. Feedback from ten focus groups was collected and used to revise the visual elements. This study examined the booklet containing the revised illustrations.

Zambia was chosen as the site for this study because of the recent approval and introduction of Medabon into the Zambian health system. Educational materials are needed to guide women through the process of having a medical abortion. Because of the low literacy rates in Zambia, it is important to have materials that are easily understood without relying on written text.

Given what previous studies have demonstrated about the benefits and limitations of using visuals as the primary means of communicating a health message, this study was designed to evaluate the booklet to determine whether it can be successfully used within Zambian communities. Cultural context is vital to the success of visual communication. Since the *Ending Pregnancy with Pills* booklet was created outside of the culture in which it will be used, misunderstanding may occur. It is important to know whether the instructions can be understood and followed safely by the women who may receive the booklet. This study built

on existing research by focusing on the visual conventions used for depicting the passage of time through the frameworks established by Hoogwegt et al. (2009) and Maes et al. (2008).

Research Questions

The study addressed two main research questions:

RQ1. To what extent do women understand the clinical directions given in the *Ending Pregnancy with Pills* booklet?

- Is the correct dosage understood?
- Are the indications for when to seek emergency medical care understood?
- Could women follow the procedure safely and accurately?

RQ2. How do women understand the visual conventions used in the *Ending Pregnancy with Pills* booklet?

- What are women's interpretations of the sequence of events within each page and throughout the booklet?
- How do women interpret the visual conventions for depicting the passage of time and motion? Does the strategy used—iconic or extra-pictorial—influence women's interpretations or understanding?
- How do women interpret images depicting multiple outcomes from one event?

CHAPTER 2

Methods

In-depth interviews were conducted with 20 women in Lusaka, Zambia (see the map of the area in Figure 3). Each interview consisted of two sections. The first part of the interview followed a semi-structured guide (see Appendix B) containing questions about visual media use, general perceptions about reproductive health and abortion, and access to reproductive health services.

The second half of the interview adapted the think-aloud technique (see Appendix B), common in usability testing (Boren & Ramey, 2000), to elicit participants' interpretations of the booklet. The interviewer showed the booklet to the participant page-by-page, asking her to describe what she saw and what she thought the story was. Afterward, some general questions were asked to assess overall impressions of the booklet. The interviewer then went through the booklet page-by-page again, describing the intended meaning. The participant was encouraged to give feedback on whether she thought the intended meaning was adequately conveyed.

The interviews were conducted by two local research assistants. Both were graduates of the University of Zambia and had previous experience working on collaborative research projects. I trained them in research ethics and the think-aloud interview technique. They also participated in a values clarification session, that I facilitated, to address their comfort level speaking about abortion. This session included information about the Zambian abortion law. Both assistants were residents of Lusaka and fluent in English, Nyanja and Bemba. For each interview, participants indicated which language they were most comfortable with and the interview was conducted in that language. Audio recordings were made and the interviewers used them to transcribe and translate each interview into English.

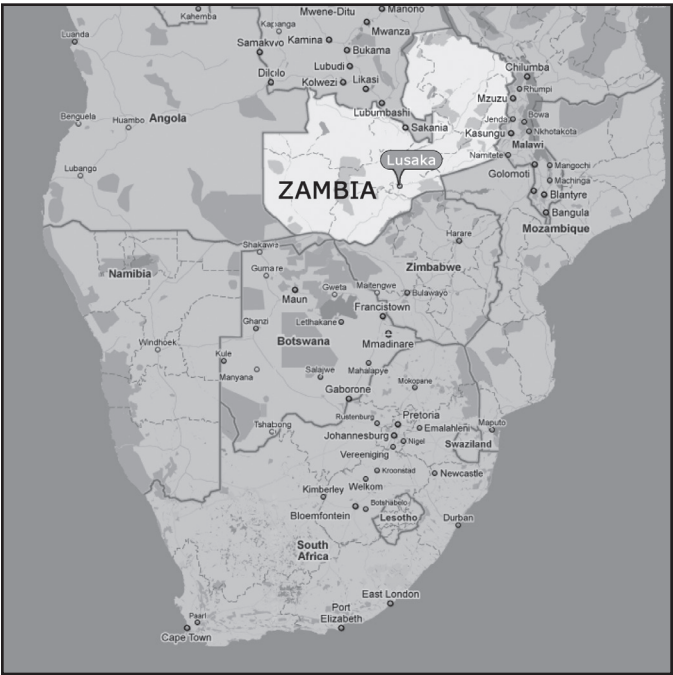


Figure 3: Map of Southern Africa



Figure 4: Map of research sites in Lusaka

The interviewers were of a different social class and had more education than the women who participated in the study. Both were in their early 20s, younger than most of the participants. The interviewers normally dressed in fashionable Western-style clothes. For example, they wore pencil skirts and high heels, styles popular with young women in many major international cities, to our training sessions. For the interview sessions, however, they both wore more traditional clothing—chitenges—in order to make the participants feel more comfortable.

Women of reproductive age were recruited from two clinics in residential areas outside Lusaka: Chilanga and Chipata (see Figure 4). These sites were chosen for the study because Ipas had existing relationships with the clinic staff and community-based health organizations (CBOs) affiliated with the clinics that helped facilitate access to the local community. Members of the CBOs, who are well known and respected at the clinics, introduced the interviewers to women who were waiting for appointments. The interviewers explained the study and informed women who were interested in participating where and when they would be available to conduct the interviews.

The interviews, each lasting approximately an hour, were held in private areas near the clinics to ensure privacy and confidentiality for the participants. Since the women had low literacy skills, a waiver of written consent was granted by the Institutional Review Board at the University of North Carolina and the University of Zambia. A script was used to explain the study in detail and obtain oral consent from participants.

Participants

Participation was limited to women between the ages of 18-40 who had completed basic school—which is defined as grades 1–9 in Zambia—or less. Twenty women, ten from Chipata and ten from Chilanga, were interviewed. Education level, measured by last grade completed, ranged from no formal education to grade 9 (see Figure 5). Two participants were currently in school; both in grade 9. The interviewers identified seven women as having at least some ability to read English. The majority of the women were mothers and

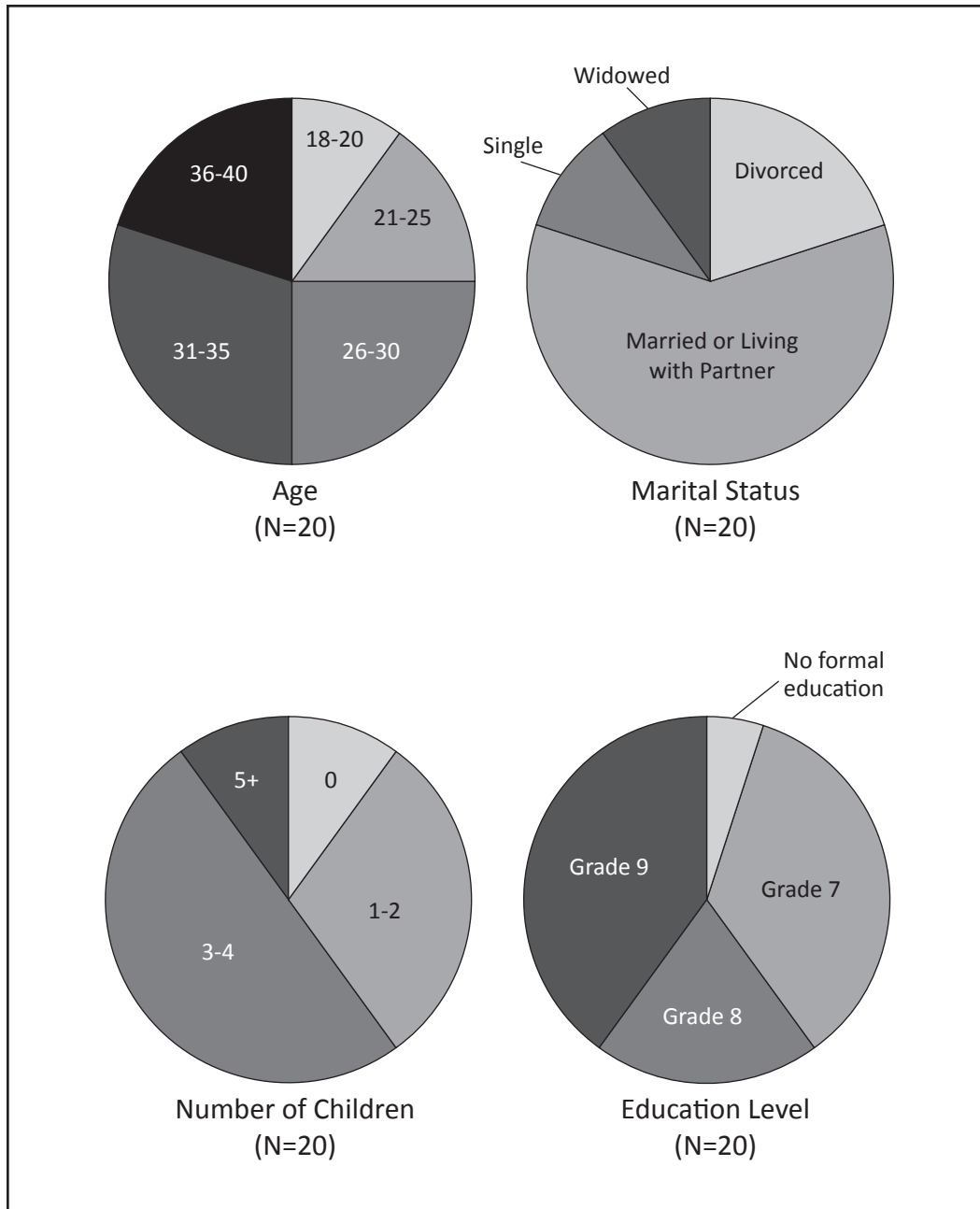


Figure 5: Demographic description of the 20 participants

either married or living with a partner. Figure 5 describes the demographic characteristics of the sample. See Appendix C for a table of participant demographics and pseudonyms.

Ethical Considerations

Because abortion is still highly stigmatized in Zambian society, women who agreed to participate in this study faced potential repercussions or embarrassment if their

participation was discovered or misconstrued by members of their communities. Precautions were taken to maintain confidentiality, including recruiting interviewers who were not members of the community. The sessions were conducted in a private area of a public space so they would not attract undue attention. To ensure women were comfortable participating in the interviews, they were informed, during both the recruiting and consent processes, that the interview was about abortion. They were advised that they could quit at any point during the interview. The women were not asked to give their names and were advised not to mention names of others. No questions were asked about the women's medical histories, including whether they had ever had, or would consider having, an abortion. Random pseudonyms were assigned after data collection in order to facilitate reporting of the results.

Analysis

In the first stage of analysis, the think-aloud portion of each interview was coded with the number of the corresponding page. The women's understanding of clinical information, that addressed RQ1, was assessed by comparing the data from each page to the intended interpretation. Specific elements that were misunderstood or omitted from the responses were identified, as were elements that were accurate.

To address RQ2, the page-by-page data were reviewed in the context of the interview to see how a participant's understanding evolved over the course of the booklet and to see whether the overall narrative arc of the procedure was understood. Participant-identified cause-and-effect relationships were coded for individual pages and for the booklet as a whole. The strategies proposed by Hoogwegt et al. (2009)—iconic and extra-pictorial—were used to code the depiction of both motion and the passage of time within visual elements. Results were then examined to see if any patterns emerged depending on the type of strategy or interpretive method required by the participant for understanding.

CHAPTER 3

Findings

In-depth findings are reported for the four sections of the booklet: making an informed decision, taking the pills, monitoring for side effects and preventing another unwanted pregnancy. Within each section, findings are broken down by theme and individual booklet page. A summary of overall findings for the booklet and analysis of individual participants are also included.

Making an Informed Decision: Pages 2-4

Pages 2-4 of the booklet (see Appendix A) introduce viewers to the main character. On page 2, she is wondering if she is pregnant. On page 3, she is deciding whether or not she wants to continue the pregnancy. The text on page 3 states that she does not want to be pregnant but the visual presents both options equally, as if she is still deciding. This is useful from an options counseling perspective, but confusing if the booklet's main role is to guide a woman who has already decided to abort through the process of a medical abortion.

On page 4, she is thinking about taking pills to induce an abortion. Again, there is a difference between the headline on the page and the narrative presented in the images. The text presents a question, as if the woman is still in the process of deciding or gathering information for her decision. The images depict her thinking about the process, but not necessarily questioning whether it is right for her needs.

Symbolic interpretation strategies.

All three pages use the thought balloon convention to present information that the main character is thinking. The thought balloon is an example of a visual element that requires the viewer to use a symbolic interpretation strategy to understand the intended message. Low-literate audiences have been found to struggle with images that require higher levels

of abstract thinking, such as symbols. Maes et al. (2008) attribute this to participants' unfamiliarity with the visual conventions used.

Arrows are another symbol used on all three pages. On page 2 and 3, the white arrow indicates the passage of time. Page 4 uses red arrows to indicate motion, in the first instance, and the progression of time in the second.

Symptomatic interpretation strategies.

In addition to symbolic images, pages 2-4 also require the viewer to understand indexical images, which require the use of symptomatic interpretation strategies. An image that functions as an index in semiotic terms is an image that is caused by or is a symptom of something else. For example, smoke is an index of fire; its presence indicates fire. On all three pages, the main character's facial expression is an index of her emotional state. Using symptomatic interpretation strategies, the viewer can learn more about the main character's emotions and state of mind.

The inset images of pregnancy symptoms on page 2 also require the viewer to use symptomatic interpretation strategies. She must understand that each inset image represents a pregnancy symptom, then connect those images to the main character who is pregnant.

"Am I pregnant?"

For page 2 (see Figure 6) overall, eight participants concluded that the main character might be pregnant. Eight others did not make a clear statement about the main character, while four thought she was sick, but not pregnant. Only five participants used thinking-related words, such as "thinking," "questioning" or "worried," to describe the main character. It is unclear whether the participants were making that conclusion from the thought balloon element or from the woman's facial expression and body language. None

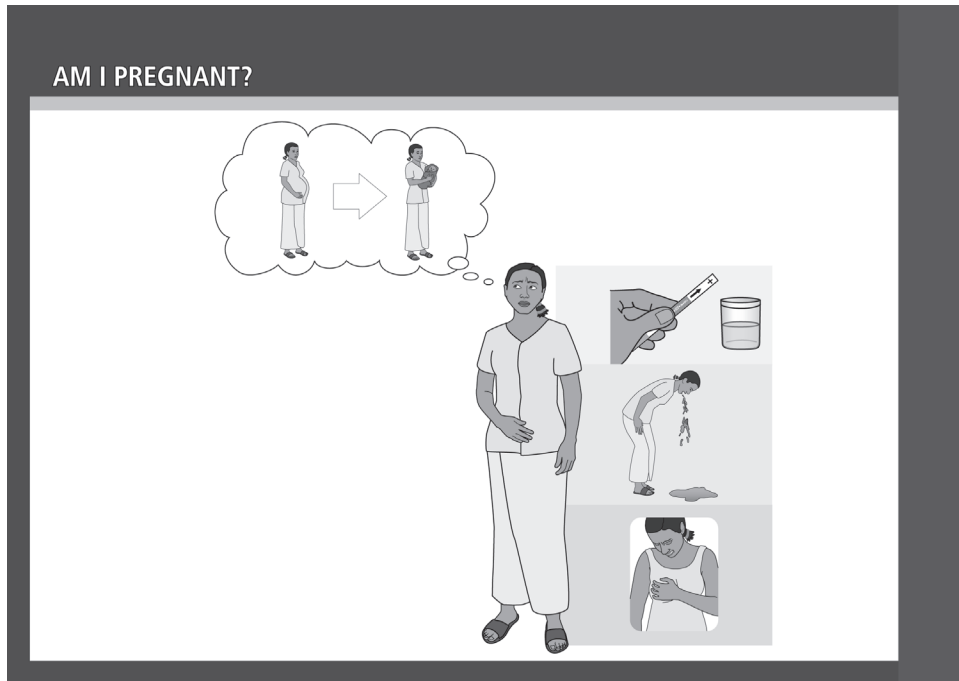


Figure 6: Page 2 of the *Ending Pregnancy with Pills* booklet

of the participants mentioned the balloon element directly, but one, when probed, does describe symptomatic cues:

Interviewer: What makes you think she is thinking?

Priscilla: Her eyes and she is holding her stomach.

Of the individual symptom illustrations, the vomiting/morning sickness image was identified by all participants. However, only five explicitly cited it as a symptom of pregnancy. Others viewed it as a sign of a stomach ailment, and in a few cases, interpreted it as a sign the main character was sick rather than pregnant:

Winnie: This woman here has stomach pains because she is holding her stomach, then here she is vomiting.

The pregnancy test was identified by six participants, but only four connected it to the possibility of the main character being pregnant.

Gloria: I think this woman is truly pregnant.

Interviewer: What else can you see on page 2?

Gloria: Here she is taking a pregnancy test to prove if she is pregnant or not.

The breast tenderness illustration proved difficult for the women to interpret. Three participants described it as “pain in the breast.” Eight women did not comment on it at all. Table 2 lists the different responses the breast tenderness illustration elicited. These results call into question the usefulness of the illustration, which may not be thought of as a typical pregnancy symptom in Zambia. One participant interpreted the image as an injury or post-partum symptom:

Flaviour: She’s holding her breast. Could be that she’s hurt or maybe she gave birth.

It was unclear whether this participant connected the inset illustration to the main character or not.

Table 2: Breast tenderness illustration responses

No mention	8
“holding her breast”	7
“pain in breast”	3
“looking at her breast”	1
“hurt or has recently given birth”	1

All of the participants mentioned pregnancy in their descriptions of the overall image, but this idea seems prompted by the picture of the obviously pregnant woman in the thought balloon.

Edna: This woman is pregnant; this other one has a baby. This one is vomiting; this one is holding her breast. I don’t know whether she is experiencing pain on the breast. This is a pregnancy tester right?

Interviewer: what do you think is in this glass?

Edna: Urine.

The participant in this quote identified the woman in the thought balloon as pregnant but does not make a statement about the main character at all. She recognizes the pregnancy test but she seems to be considering the elements of the image in isolation, not necessarily connecting them into a larger narrative message.

This type of “listing” response was used by many of the participants frequently during the interviews. They described what the visual elements represented at an iconic level, without any additional interpretation.

Eight of the 20 participants appeared to link the symptom images to the possibility that the main character was pregnant. The others did not make a clear connection between the symptoms and the other visual elements on the page.

“I don’t want to be pregnant.”

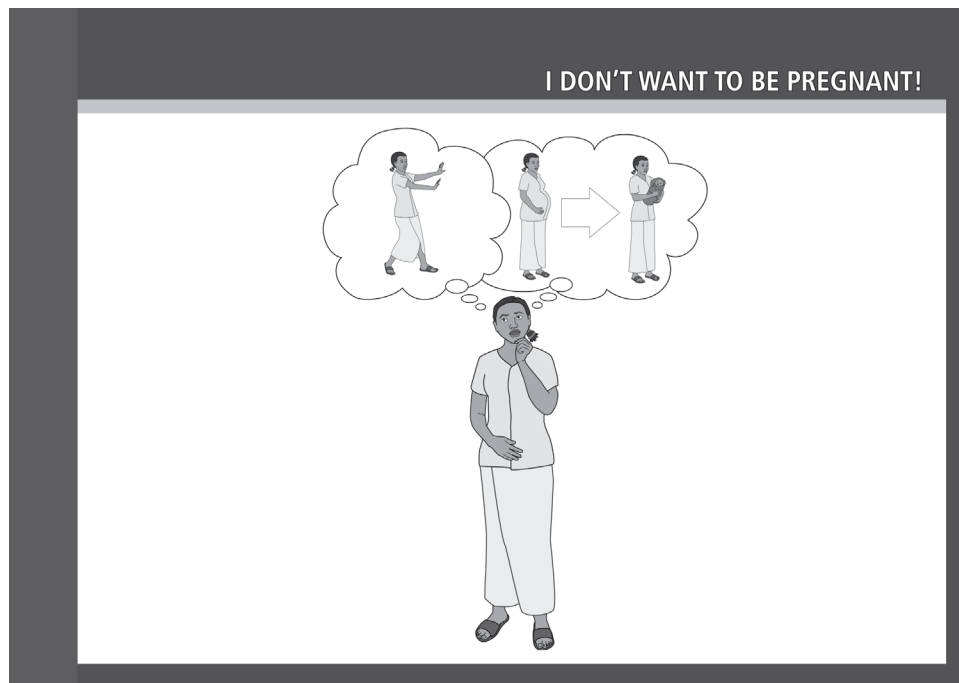


Figure 7: Page 3 of the *Ending Pregnancy with Pills* booklet

Two thought balloons are used in the page 3 image (see Figure 7). The first illustrates the woman in a gesture of refusal, arms outstretched, while the second shows her continuing the pregnancy and holding an infant. In addition to identifying that the main character is thinking, the intended message depends on the viewer interpreting the gesturing woman both symptomatically—to establish that she is refusing or saying no to something—and symbolically—she represents the main character’s feelings about a pregnancy.

The number of participants who used thinking-related words to describe the image increased on page 3; ten of the 20 participants identified the main character as “thinking.”

The woman gesturing “no” was somewhat confusing for participants. Half thought the image conveyed the intended meaning. Others interpreted the same image as “happy,” “shouting or talking” or “pushing.”

Interviewer: Page 3?

Dora: She is pregnant here and she has a child here. She is standing here.

Interviewer: What about here?

Dora: She looks likes she is shouting or talking.

Several participants identified that the gesturing woman in the thought balloon did not want to be pregnant, but it was unclear if they made a connection between the scene within the balloon and the main character.

Interviewer: What can you see on page 3?

Jean: This woman is lifting her hands, then here she is pregnant. Here she has a baby.

Then down here, she is holding her stomach and her mouth.

Interviewer: What do you think this woman lifting her hands is saying?

Jean: I think she is saying that she does not want to be pregnant.

Only two participants understood the message of the page as intended.

Jennifer: She is still thinking?

Interviewer: what do you think she is thinking about?

Jennifer: I think she is saying she does not want to be pregnant and have a child.

“Can I take pills to end pregnancy?”

Page 4 (see Figure 8) shows the main character thinking about the process of a medical abortion in order to decide if it is an appropriate option for her. The image uses two thought balloons, like page 3, but instead of showing a possible outcome and a reaction to that outcome, it illustrates steps in a process.

In the first balloon, the woman takes a pill. This action is represented with a red arrow. In the second balloon, the woman is shown in bed with blood on the mattress between her legs. A red arrow represents the passage of time to the next scene, where the woman is

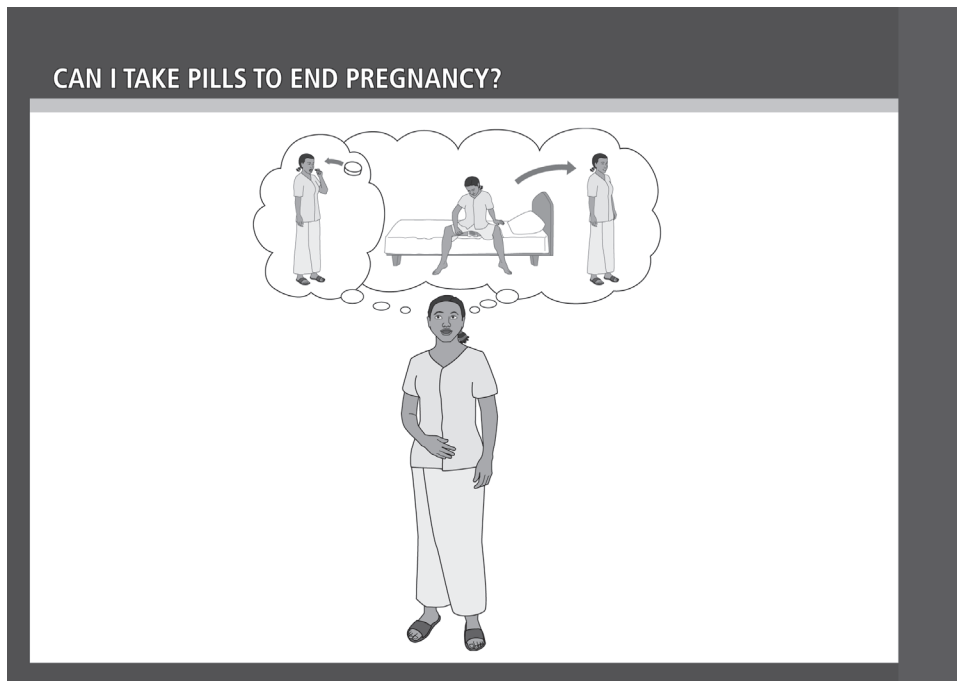


Figure 8: Page 4 of the *Ending Pregnancy with Pills* booklet

standing, abortion completed. The use of arrows to symbolize multiple meanings makes it difficult for viewers to establish symbolic meaning for the visual element.

Interpretations of what the image depicted varied. Nine participants concluded that the woman in the thought balloon was terminating a pregnancy. Four others thought the bleeding was her normal period. One thought the woman was sick, while another thought she may have given birth. Several did not make an interpretation beyond “bleeding.”

Only three of the 20 participants completely understood the intended meaning:

Natasha: Here she is thinking about terminating the pregnancy. She is thinking if she can take a pill to end her pregnancy.

Several others understood that the woman in the second balloon was terminating a pregnancy, but did not clearly connect that the images within the balloon were the main character’s thoughts.

Liz: This is medicine.

Interviewer: What medicine is it?

Liz: It’s a pill.

Interviewer: What kind of a pill is it?

Liz: For terminating a pregnancy.

Interviewer: What about here?

Liz: She has managed to abort.

Interviewer: And here?

Liz: She looks fine.

Interviewer: What do you think about the whole picture?

Liz: She is not pregnant here.

Four participants used thinking-related words to describe the image. One participant commented directly on the thought balloon element in response to page 4:

Jennifer: I think all this in this balloon is what she is thinking of doing.

Participants' understanding of "thinking" concept.

Overall, ten participants used thinking-related words to describe the main character on one of the three pages that used the convention. Page 3 elicited the most "thinking" responses. We cannot draw definitive conclusions on whether the participants were using symbolic interpretation strategies or symptomatic strategies or a combination of both. On page 3, the main character's head is tilted and her hand is raised to her chin. This stance is markedly different than her stance on the pages two and four (see Figure 9), and may be more closely linked to "thinking" by the participants than the others. Three participants specifically commented about the woman's stance, but did not directly link it to thinking:

Edna: Down here, this woman is holding her stomach and the hand on the chin.

One participant, Jennifer, who commented directly on the thought balloon on page 4, appears to be testing her understanding of the thought balloon convention with the interviewer over the course of the interview.

Interviewer: page 2?

Jennifer: It's that same woman and here she is thinking.

Interviewer: What do you think she is thinking about?

Jennifer: She is thinking that she may be pregnant; here she is holding a baby. On the other side here she is vomiting, and then here she is holding her breast. Am not sure what these other pictures are about.

Interviewer: Page 3? What can you see?

Jennifer: She is still thinking?

Interviewer: What do you think she is thinking about?

Jennifer: I think she is saying she does not want to be pregnant and have a child.

Interviewer: Page 4?

Jennifer: She is thinking about taking medicine.

Interviewer: What about the next picture?

Jennifer: I think she has aborted. I think all this in this balloon is what she is thinking of doing.

Jennifer had some understanding of the thought balloon convention from the outset of the interview and sought to confirm her knowledge during the process.

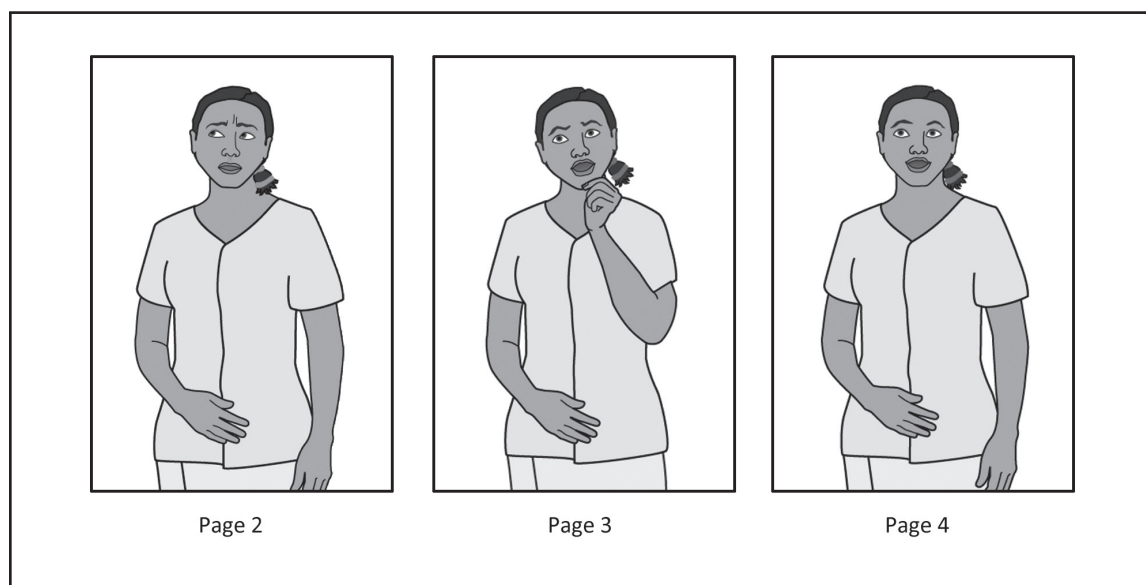


Figure 9: Main character's expressions from pages 2-4 of the *Ending Pregnancy with Pills* booklet

Taking the Pills: Pages 6-8

Pages 6-8 illustrate the process of having a pill-based abortion. Page 6 transitions from the options counseling portion of the booklet to the clinical instructions, detailed on page 7. Page 8 informs viewers what will happen after taking the pills.

All three pages require the viewer to understand time-based relationships. Each page uses a different visual device for presenting the sequence of events, however, requiring viewers to understand three different combinations of symbolic and iconic elements.

“What should I do before taking the pills?”

Page 6 (see Figure 10) uses a numbered grid to present a sequence of three scenes. The intended message for the page is that the main character needs to consider if a medical abortion is the appropriate procedure for her, and should consult a medical provider for advice before taking the pills.

The numbered grid approach seemed successful in terms of prompting the participants to describe the scenes in order. However, the women’s understanding may have been

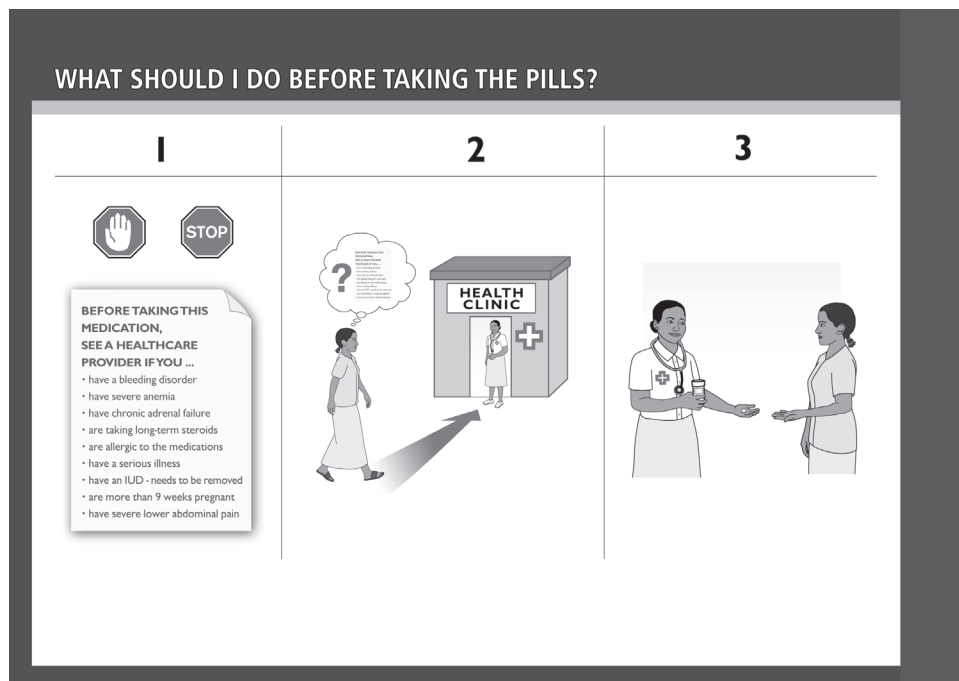


Figure 10: Page 6 of the *Ending Pregnancy with Pills* booklet

influenced by the way the interviewers phrased their questions about the page. The language used in several of the interviews may have led the participants to view the image in the intended order:

Interviewer: Page 6. Tell us what you see in slot 1, 2 and 3. What do you think is happening?

Mavis: There is a hand on slot 1. Here the same woman is going to the clinic and there is a nurse standing there in slot 2. The nurse is giving her medicine and she is stretching her hand, maybe it's because she wants to take it, and there is a cup here and it could be water.

As the quotation illustrates, the first scene was somewhat confusing for the participants. It relies exclusively on symbolic elements and written words—a highly-simplified illustration of a hand within a red octagon, a stop sign, and a written list of contraindications—to convey its intended meaning.

The majority of the women listed the elements in the first scene without assigning any particular meaning in relation to the narrative, either within the page or in the overall booklet. Only three offered an interpretation of the scene as an indication that they should not take the medication without seeking advice from a health care provider first:

Natasha: I think it says that you should not take medicine before seeing the doctor.

The stop sign was not easily recognizable. Only one woman used the phrase “stop sign” to describe it. Five other women read the word “stop.” The list was described as “instructions,” a “handbill” and “writing.” However, most participants did not mention it at all. Seven participants mentioned the hand symbol, but did not expand on its potential meaning.

The second scene was recognized as a woman going to the clinic by all participants. Two women mentioned the question mark in the thought balloon. One merely mentioned its presence, the other interpreted it:

Natasha: She is going to the clinic. Then I can see a question mark which means that before taking the medicine, she has to see the doctor.

One woman indicated that she interpreted the arrow in the second scene as representing motion:

Elisha: In slot 2, I can see this person going to a health clinic and a nurse at the door.

Interviewer: What has made you think she is going to the clinic?

Elisha: Because of this thing here. (She points to arrow.)

All the participants identified the health care provider giving medicine to the woman in the third scene, however, there was disagreement on what the medicine was for. Many did not mention a purpose for the medication, only noting that it was given to the main character. Only three identified it as “for abortion,” indicating that they were making connections between the image shown on this page and those shown on previous pages. Two participants thought the pill was for family planning, while another two interpreted it as relating to prenatal care.

“How do I take the pills?”

Page 7 (see Figure 11) is one of the most complex pages in the booklet. It is also one of the most important; it contains the clinical information on how and when to take the second dose of medication at home. The first dose, shown in the first scene, is usually taken at the clinic with a provider looking on. The second dose, shown in the third scene, is taken at home.

A combination of iconic and extra-pictorial strategies are used to convey the passage of time on page 7. The large, white arrows used to transition between scenes are an extra-pictorial device, while the sun and moon images are icon indicators. The inclusion of the clock element is a symbolic representation of time.

Iconic elements, such as the sun and the moon, are appropriate for conveying the passage of larger, more experience-based units of time, such as days. However, page 7 needs to include information on smaller, more convention-based units as well. The clock is used to depict the passage of 30 minutes, a unit that is challenging to depict in an iconic manner.

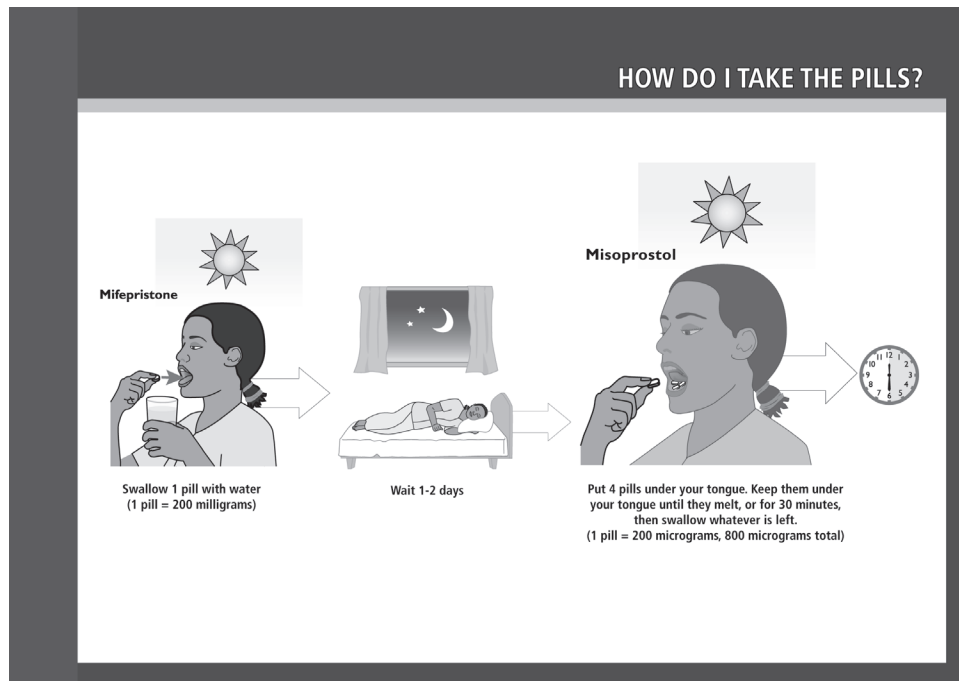


Figure 11: Page 7 of the *Ending Pregnancy with Pills* booklet

Overall, the women understood the larger passage of time depicted on page 7. Fifteen participants used time-related words, such as “afternoon” or “night,” to describe the images:

Jean: On the 1st picture, the woman is taking medicine, then here she is sleeping in the night, then here, she is taking medicine again in the afternoon. I can also see a clock.

The remaining five referred to the woman sleeping but did not specifically mention the passage of time.

Another complicating factor on page 7 is the use of arrows to indicate both time and motion. In the first scene, a small, red arrow is used to convey that the woman is placing the first pill in her mouth. In the third scene, however, a similar motion is shown without an arrow.

The majority of participants interpreted the first scene as the main character taking medicine or pills. An alternate interpretation was offered by three, who thought the character was “washing her mouth.” All but one of the participants understood the second scene to represent the character sleeping during the night. One did not mention the scene at all.

All of the participants understood that the main character was taking medicine in the third scene. Seven specifically mentioned the placement of the pills under the tongue—an important piece of clinical information. Three of those comments were elicited by interviewer prompting; four were spontaneous.

The relationship between the clock and the scene was unclear to the majority. In several cases, the interviewer mentioned the clock before the participant was given an opportunity to identify the illustration herself. Aside from those instances, all of the women identified the clock, however, only one understood that the shading represented a 30-minute time interval.

Priscilla, a 36-year-old woman, who was taking night school classes to complete ninth grade, was the only participant who understood the instructions on page 7 completely. The language she used to describe the page was the same as the written instructions provided, implying that she could read the text.

Priscilla: She is taking medicine with water then she sleeps/waits for 1-2 days. What could this be? This medicine, number 3, she takes 4 pills and puts them under her tongue to melt for 30 minutes.

Interviewer: How did you know that it's 30 minutes?

Priscilla: What?

Interviewer: How did you know that it's 30 minutes?

Priscilla: I have seen here the clock is showing.

The majority of the participants did not seem to see a relationship between the clock and the other images or, if they did, they did not share it with the interviewers. Many comments merely noted the presence of the clock without elaborating on its purpose:

Interviewer: Page 7?

Gloria: Here it looks as though the medicine she was given at the clinic is for terminating the pregnancy so she is taking it.

Interviewer: What about the next picture?

Gloria: It is night time and she is sleeping.

Interviewer: What about here?

Gloria: It shows that she is taking medicine again that she has been given by the doctor.

Interviewer: What about here (time)?

Gloria: This is a clock/time.

Interviewer: What can you see on this clock?

Gloria: It shows time. Am not sure whether it is 6 o'clock in the morning or 12 hours.

Several women interpreted the clock as an indication that the medicine should be taken at the same time both days:

Natasha: She is taking the pill. Then here she is resting in the night after taking the pill. Here she is taking the pill again at the same time she took the other one. Time is 12:30 hours.

Many participants interpreted the clock at showing a specific time, usually either 12:00 or 6:00.

“What will happen?”

Page 8 (see Figure 12) presents two scenes within panels, in style similar to comic books. An arrow—an extra-pictorial element—is used to convey a time based relationship between the two panels.

While the second scene is a relatively simple depiction of the woman cooking, the first scene has several timelines nested within it. The sun, viewed through a window, is an iconic strategy to convey that the scene takes place over the course of a day (see Figure 13). A series of menstrual pads with varying amounts of blood are connected with arrows in a diagram intended to convey that the woman's blood flow will increase, then decrease during the day (see Figure 14). The blood flow diagram is notable because it depends solely on arrows to depict the progression; without understanding of this extra-pictorial strategy, it could be viewed as a number of bloody pads existing simultaneously.

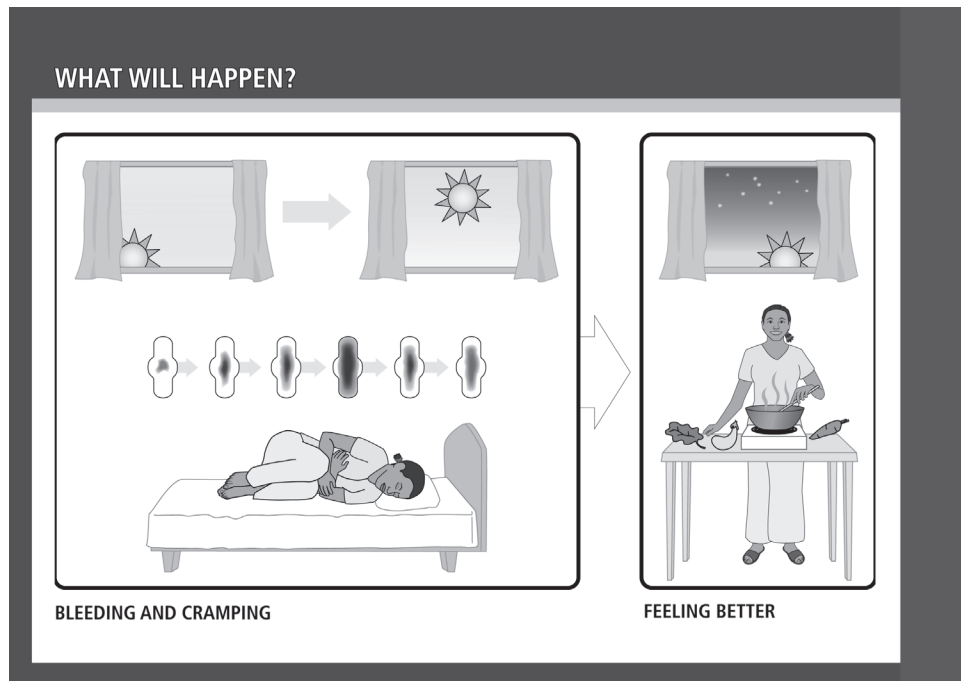


Figure 12: Page 8 of the *Ending Pregnancy with Pills* booklet

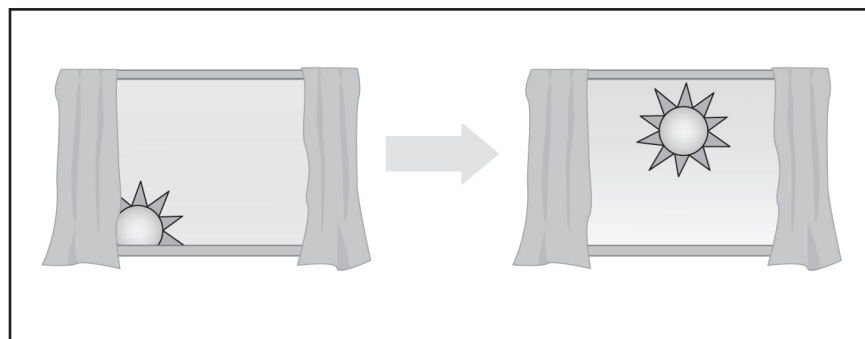


Figure 13: Time of day segment from first scene, page 8

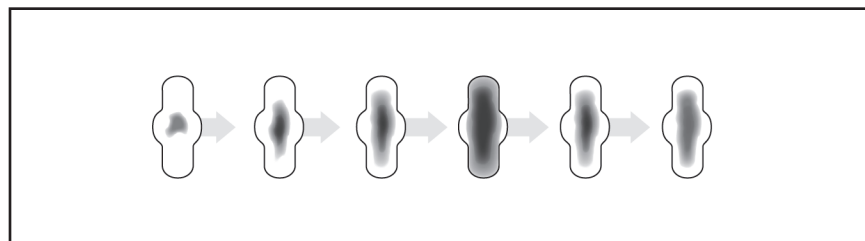


Figure 14: Blood flow diagram from first scene, page 8

Fourteen participants used time-related words to describe the relationship between the first and second scenes. However, the visual structure created by the nested diagrams within the first scene was confusing to many of the women.

To understand the intended message of the first scene, participants must interpret each element individually and within the overall visual structures. The blood flow diagram requires a viewer to use iconic strategies to recognize the illustration as a representation of a sanitary pad. Since not all women use commercially produced sanitary pads similar to those depicted, this is challenging. Symbolic interpretation strategies are required to understand that the arrows represent the passage of time. Finally, symptomatic interpretation strategies must be applied to understand that the blood is a result of the main character's abortion. The presence of the sun visual element gives an additional, iconic indicator of time that applies to the scene as a whole.

One factor complicating the interpretation of this scene is that, while the woman lying in the bed and the windows could be viewed as an iconic scene, the blood flow diagram does not fit within that scene. It is an extra-pictorial element added on top of the scene, containing elements that can be interpreted using iconic, symptomatic and/or symbolic strategies.

Only four participants recognized the sanitary pads. They were usually mentioned in a matter of fact manner and none of the participants who identified them said anything about why they thought the main character might be using them:

Jennifer: This looks like morning, then here afternoon and then these look like pads and she is sleeping.

Six other participants mentioned bleeding or blood in connection with the first image; two specifically mentioned menstrual bleeding. Three women interpreted the diagram with the sanitary pads as representing bleeding that increased, then decreased in intensity over the course of the day. Natasha, a 27-year-old woman who had completed the ninth grade, specifically credited the arrows as illustrating the passage of time:

Natasha: I think this woman is lying because she is having period pains. I can see a change in the flow of her periods. It is increasing and decreasing towards the end. Above here, these arrows are showing the change in time. On the other side, I think this woman is feeling better and the pregnancy has been terminated.

Thirteen participants spoke about the woman cooking, but only seven mentioned that she was feeling better in the second scene. Three women commented that she was both feeling better and cooking, while two did not comment on the second scene at all.

Overall, only four participants understood that the main character was aborting a pregnancy.

Mavis: The sun is slightly out, here the sun is out and here it's evening. She is sleeping here and cooking here.

Interviewer: Do you know what these are (pads)?

Mavis: No I don't know what that is.

Interviewer: You have never seen them before?

Mavis: It looks like blood.

Interviewer: Can you explain to us what was happening?

Mavis: She was pregnant. Maybe she has had an abortion.

This quote is also notable because the woman, Mavis, is making a connection between knowledge about the main character revealed on previous pages—that she is pregnant—to the current page.

One participant thought the woman in the pictures was feeling unwell because of her period. Others did not draw any conclusions at all, making only descriptive comments:

Ruth: I can see the sun, windows, pads, the woman sleeping on the bed. She is cooking, there is a banana, stove pan, table, carrot and vegetables. Can also see the sun and stars.

Time sequences.

Pages 7 and 8 both elicited time-related responses from the majority of participants.

While it is difficult to say conclusively, it would appear that iconic strategies—the use of elements such as the sun and moon— were more easily understood as representing the passage of time than the extra-pictorial strategies. The time aspect of the blood flow diagram, which relied more heavily on extra-pictorial elements, was understood by only three participants. While it is too complex to be a clear comparison, the responses to the blood flow diagram hints at the weaknesses of extra-pictorial elements for this population.

Another possibility to consider is the power of visual elements such as the clock or the sun and moon to prompt participants to think about time in general. None of the participants used time-related words to describe page 6 or 10, both pages that depict a series of events but do not have a distinct, time-related, iconic cue. While the women did not interpret the time interval represented by the clock image as intended, they did link the clock to time.

Monitoring for Dangerous Side Effects: Pages 9-13

Page 9 illustrates potential side effects that the woman may experience during the process of a medical abortion. Page 10 depicts hemorrhaging, an emergency situation that requires immediate medical care. Page 11-13 help women monitor side effects to determine when to seek medical care.

Exclamation symbol.

A red box with a white exclamation point, shown in Figure 15, is used as a warning symbol on pages 10-13 and 16. Most participants were unfamiliar with the symbol and did not find it meaningful. Overall, five participants associated it with a meaning similar to the



Figure 15: Exclamation mark symbol

intended “warning.” Three interpreted it as “danger,” although only on page 10. They, like the majority, did not comment on subsequent appearances of the symbol. Table 3 summarizes participants’ responses to the exclamation mark symbol over the five pages on which it appeared.

The exclamation mark symbol is more arbitrary, and, in contrast to the thought balloon, has fewer symptomatic or iconic cues to help viewers establish its meaning.

Table 3: Participants’ responses to exclamation point symbol

Response	Page 10	Page 11	Page 12	Page 13	Page 16
No response	1	17	20	20	11
“I don’t know”	13	1	—	—	5
“Danger”	3	—	—	—	—
“Blood” or “heavy bleeding”	2	1	—	—	—
“Clinic”	1	—	—	—	—
“Full stop”	0	1	—	—	1
“Ambulance”	—	—	—	—	1
“Emergency”	—	—	—	—	1
“Something you have to do quickly”	—	—	—	—	1

“What are the possible side effects?”

Page 9 (see Figure 16) illustrates four possible side effects: vomiting/nausea, headaches, fever/chills and diarrhea. The page is split into quadrants by a grid. The main character is presented experiencing each of the four side effects. Although the grid element is similar to the grid used on page 6 to indicate a sequence of events, on page 9, it is intended to show events that could occur simultaneously.

The vomiting illustration was recognized by all participants. Thirteen participants identified the headache illustration as “headache.” Four women described the woman in the image as “holding her head.” Other interpretations included: “not feeling well,” “swollen” and “worried.”

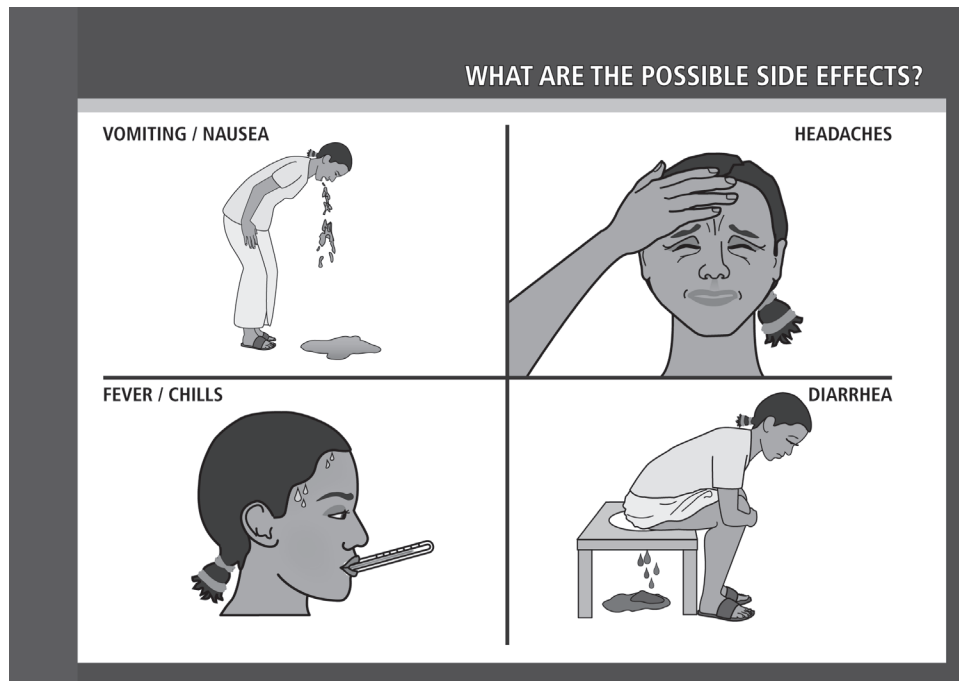


Figure 16: Page 9 of the *Ending Pregnancy with Pills* booklet

The fever illustration shows a woman sweating, with a thermometer in her mouth to indicate a high temperature. The thermometer illustration was not familiar to most participants; only six identified it either by name or by function. Two participants interpreted it as a tooth brush. Others offered no response or said they didn't know.

Since the fever illustration relied heavily on the thermometer element to convey the concept of fever, the confusion surrounding that element may account for the low number of participants who recognized that side effect. Only three participants identified the illustration as representing fever. Other interpretations included "sweating" and "brushing teeth." Half the participants either did not comment or responded that they didn't know what the illustration was. One participant, who did not recognize the thermometer, did interpret the image as representing fever:

Interviewer: What about this picture?

Grace: Here she's got a fever.

Interviewer: What about this, what is this?

Grace: (Quiet)

Interviewer: Could it be a cigarette?

Grace: Uhhh [no]

Interviewer: You don't know what it is?

Grace: (Shakes her head, no)

She may have been responding to the sweat beads and the flush on the main character's face or she may have just not been able to think of the word "thermometer." This is also an example of the interviewer inappropriately breaking from protocol and asking a leading question.

The diarrhea illustration was recognized by all but two participants; one did not respond and the other interpreted it as "pain in the knees."

Overall, only two women—Priscilla and Gloria—interpreted the symptoms as side effects related to medication. Interestingly, they were also the two participants who were currently enrolled in school to continue their education. The majority just identified the images without connecting them to the larger narrative. Only one participant, Gloria, made the connection between the side effects and abortion:

Interviewer: What do you think about this page?

Gloria: After terminating the pregnancy, she is feeling sick. She is experiencing side effects. Here she's vomiting, she has a headache, she has fever and here she has diarrhea.

Interviewer: Do you know what this is?

Gloria: It is for putting here. (She demonstrates putting it in her armpits.) It is used for measuring.

The other participant who identified the symptoms as side effects, Priscilla, thought they were caused by birth control pills:

Priscilla: This page says that the medicine can have problems. Anyway medicine for family planning has problems. Sometimes you may take microgynon² and you don't respond well to it. Sometimes you will have headaches and sometimes diarrhea.

“Go to the health clinic if you have...”

Page 10 (see Figure 17) is the first page of instructions on when to seek emergency care for complications. Since heavy bleeding is a potentially life-threatening complication, it is very important for women to understand that it is an emergency.

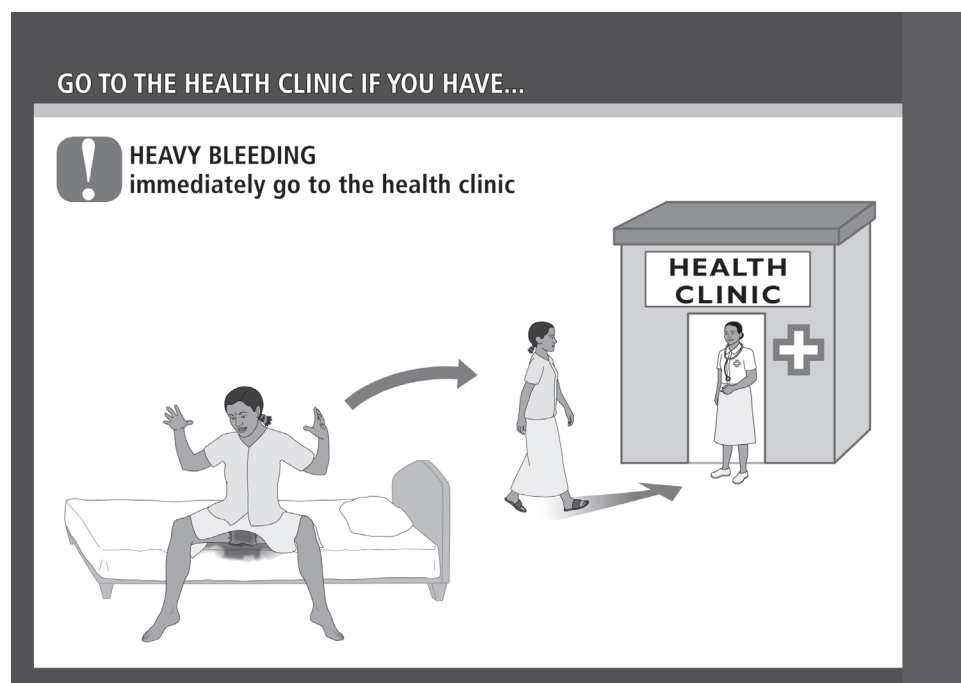


Figure 17: Page 10 of the *Ending Pregnancy with Pills* booklet

The page shows two scenes. In the first, the main character is in bed with blood soaking the mattress between her legs. She has her hands up in an expression of shock or surprise. The second scene is the main character walking to the clinic. A red arrow is used to represent motion in the second scene. The two scenes are connected with another red arrow, designed to establish a cause-and-effect relationship between them.

² Microgynon is a type of oral contraceptive pill available in Zambia.

Fifteen women described the main character in the first scene as bleeding. Three used the term “heavy bleeding” which was written at the top of the page, an indication that they had at least some ability to read English. Another three interpreted the blood as the woman’s menstrual period:

Maggie: Here she woke up only to find that she is on her periods.

One identified the woman as having a sexually transmitted infection:

Emma: She has sores on her private parts.

Four participants inferred that the main character was bleeding due to an abortion:

Gloria: She has terminated the pregnancy and she is bleeding.

The majority of participants described the second scene as depicting the woman going to the clinic, but didn’t necessarily connect that she was going to the clinic because of the bleeding:

Interviewer: Page 10?

Jurita: She is bleeding.

Interviewer: Anything else that you can see?

Jurita: She is going to the clinic here.

Interviewer: Do you know this sign? (exclamation symbol)

Jurita: Uhmmm (no)

Only seven women clearly stated that the main character was going to the clinic in response to the bleeding.

Natasha: She is bleeding, then decides to go back to the clinic.

Interviewer: Why do you think she has decided to go back to the clinic?

Natasha: Because she is bleeding too much.

The interviewers questioned several participants about the significance of the arrows.³

³ Despite training, the two interviewers were not completely consistent with when and how they probed for additional meaning. As a result, not all participants were asked specifically to comment on their interpretations of the arrows.

One woman seemed to interpret the arrows as indicating a cause-and-effect relationship between the two scenes:

Interviewer: What do these arrows mean?

Liz: She has been bleeding heavily so she is going to the clinic.

Two participants interpreted the arrows as signifying directions:

Interviewer: can you tell what these mean? (arrows)

Gloria: They are showing direction that one has to go to the clinic.

Others merely identified them as arrows, without attaching any specific meaning to their presence:

Interviewer: Page 10?

Dora: She looks like she is bleeding.

Interviewer: Do you know what these are? (arrows)

Dora: They are arrows.

Interviewer: And here?

Dora: This is the clinic.

“Go to the clinic if severe side effects last more than a day”

Pages 11–13 illustrate when the main character should seek medical care for a side effect that may be routine for shorter durations. In order to understand the information as intended, the time sequences need to be presented in a way that is clear and understandable to the viewer. Recognition of the side effects is another essential component to interpreting the intended message.

The three pages use very similar visual elements to convey the progression of time: large, gray arrows combined with images of the sun or moon viewed through a window. Pages 12 and 13 include two time-based sequences separated from each other by a black line. Overall, fifteen participants used time-related words to describe at least one of the three pages.

On page 11 (see Figure18), the condition prompting the woman to seek medical attention elicited many different responses. Eleven participants described the image as some type of pain or sickness, although eight participants thought she was sleeping. Table 4 shows the variety of responses. Some participants used more than one term to describe the woman's condition.

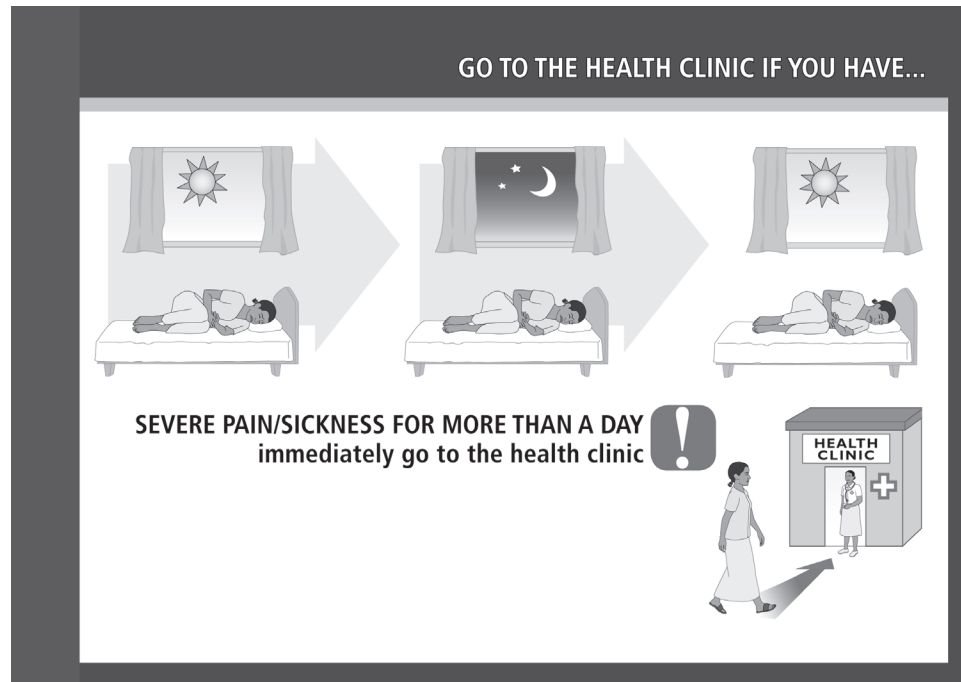


Figure 18: Page 11 of the *Ending Pregnancy with Pills* booklet

Table 4: Description of the woman's condition on page 11

Sleeping	8
"Not feeling well"	4
"Stomach hurts"	4
Sick	3
Pain	2
"Period pains"	1

Pages 12–13 (see Figures 19 and 20) reuse the symptom illustrations from page 9 (see Figure 16). The repetition appeared to increase the participants' recognition of the symptom illustrations. It may have been helpful for participants to see the images in the context of another page; they could learn the concepts in a similar manner to a reader learn the

meaning of a new word by seeing it used in a sentence. It may have also given them more time to think and respond or an opportunity to describe the image using different words.

One woman, Priscilla, who did not offer an interpretation of the fever image when it was presented on page 9, described it as “you feel cold like malaria” on page 12. Edna, who interpreted the diarrhea illustration on page nine as “pain in the knees,” on page 12, referred to the same illustration as “answering the call of nature.” Conversely, another participant, Blessings, who did not have a response for the fever image on page 9, interpreted the woman as “feeling better” when asked about the same image on page 12. By page 13, all but two of the participants had identified the headache image using the phrase “headache.”

Including the first and second appearances, the vomiting and diarrhea illustrations were recognized by all participants. The headache illustration was recognized by 18 women. Recognition of the fever image, however, did not improve dramatically after participants viewed it a second time; only nine women ever identified it as fever or chills after page 12.

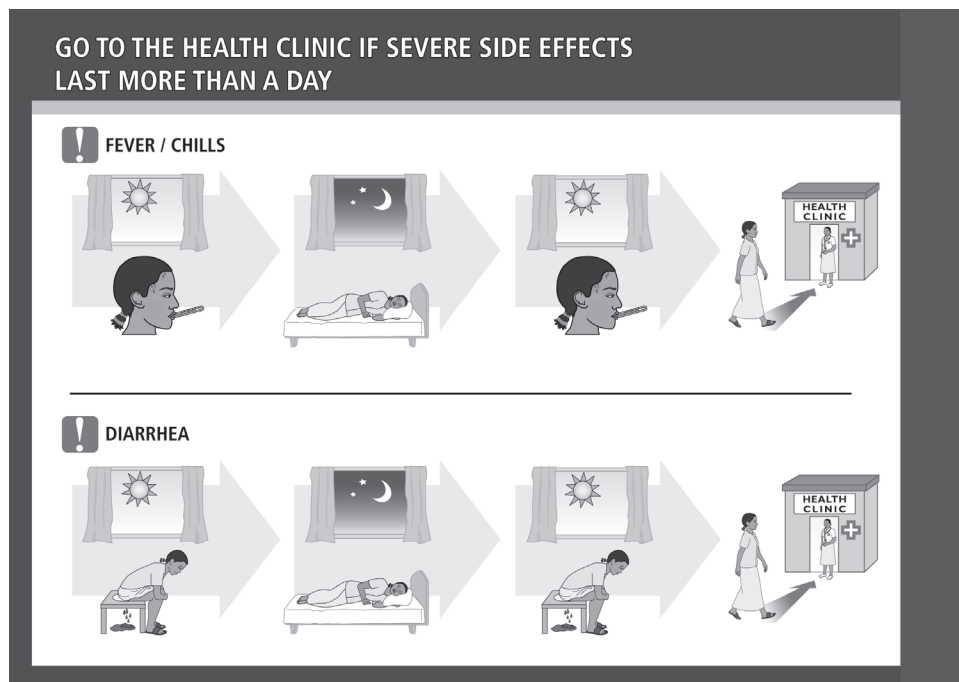


Figure 19: Page 12 of the *Ending Pregnancy with Pills* booklet



Figure 20: Page 13 of the *Ending Pregnancy with Pills* booklet

Preventing Another Unwanted Pregnancy: Page 15

“What can I do to avoid future pregnancy?”

Page 15 (see Figure 21) shows the main character receiving post-abortion family planning counseling from a nurse at the clinic.

The majority of participants seemed to identify the scene as a family planning counseling session. Eleven clearly stated that the woman was there for family planning. Four others said that the chart contained family planning methods but did not explicitly state that the woman was at the clinic for family planning.

Condoms were the most frequently identified contraceptive method. All the participants recognized at least one of the condoms pictured. Birth control pills were the second most identified method, recognized by 12 women.

The implant was also familiar methods to many women—nine recognized the implant illustration, and five mentioned the brand name “Zhadel” in association with an illustration on the page.

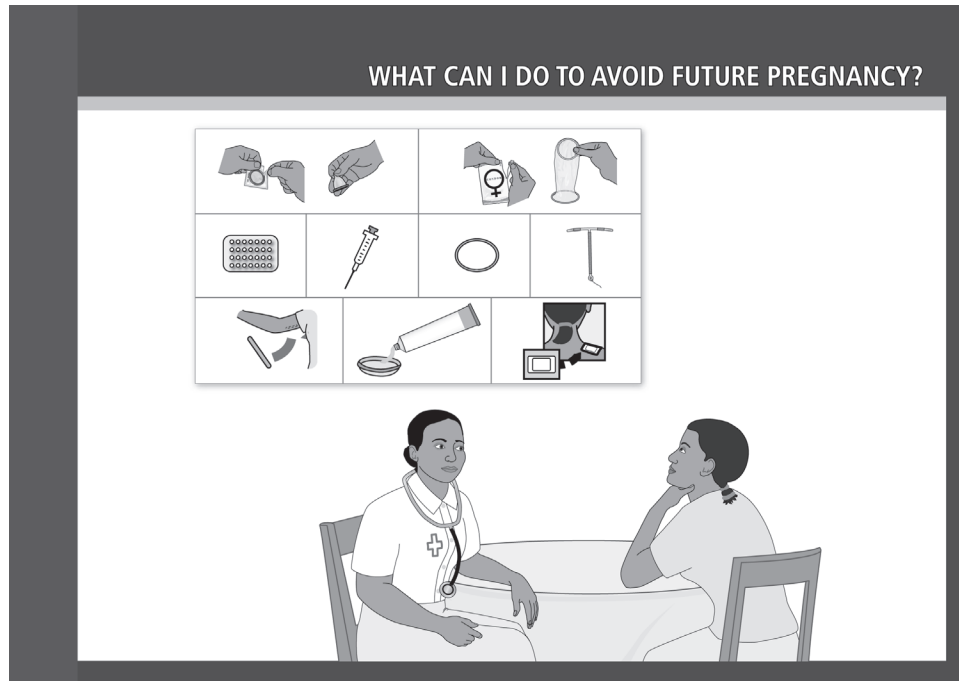


Figure 21: Page 15 of the *Ending Pregnancy with Pills* booklet

The IUD—called a “loop” in Zambia—was another familiar contraceptive method. Ten participants described one of the illustrations as a “loop,” however it was not always the IUD illustration (see Figure 22). The misidentification indicates that while women have heard of the IUD, they aren’t familiar with what an IUD actually looks like.

The contraceptive ring illustration (see Figure 22) was sometimes interpreted as a “loop” or a condom. Seven participants identified it as some form of contraceptive. The diaphragm and contraceptive patch illustrations (see Figure 22) were unfamiliar to this audience. The majority of participants responded with “I don’t know” for both illustrations. Table 5 summarizes participants’ responses to the diaphragm and the contraceptive patch.

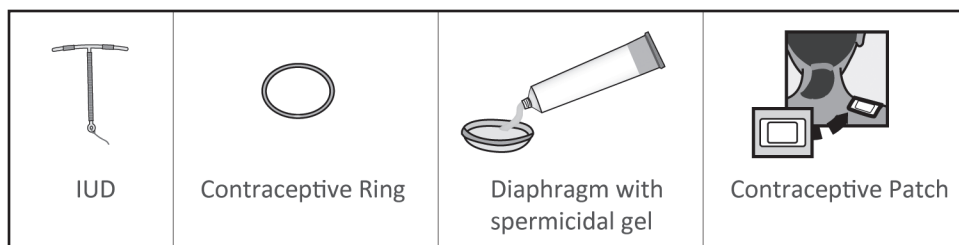


Figure 22: Detail of contraceptives illustration from page 15

Table 5: Participants' responses to diaphragm and contraceptive patch illustrations

Response	Diaphragm illustration	Contraceptive patch illustration
"I don't know"	10	12
No response	2	2
Medicine	4	—
Dish or plate	3	—
"Camera"	—	1
"A small TV"	—	1
The woman's back	—	4
Contraceptive	1	—

Two participants, Edna and Maggie, interpreted the scene as the woman receiving pre-natal care.

Maggie: I can see a condom, these are pills for pregnancy.

Interviewer: What does it do?

Maggie: when we are pregnant, we take tablets to prevent the baby from contracting any diseases.

Interviewer: What else can you see?

Maggie: An injection.

Interviewer: What is it for?

Maggie: It's the same as pills. When we are pregnant, they inject us as well.

Interviewer: What is the next picture?

Maggie: I don't know what this is. I have no idea what this is. This is an arm then this is medicine being put in a dish/plate. This is a back of a person. She is facing the other side and they are checking something. I really don't know what they are checking. Here she is seeing the doctor.

Interviewer: What do you think they are discussing?

Maggie: She is telling her the problems she has.

Interviewer: What problems exactly?

Maggie: The problems we experience during pregnancy.

Overall Understanding of the Booklet

Understanding of the booklet as a whole also varied. Some women seemed to understand that the main character was having an abortion, while others did not. In some instances, the participant contradicted herself, making it difficult to draw a conclusion about her understanding.

One positive outcome was that several participants, regardless of their understanding of the intended meaning of the booklet, took away the message that they should visit the clinic for health issues.

Ruth: It has taught me about how the woman was pregnant, had a child and the baby's health and how to care for the baby. When you are sick you must go to the clinic.

Jean expressed a similar thought:

Interviewer: what have you liked the most?

Jean: I like the emphasis on going to the clinic whenever one has a problem.

Priscilla: Understands individual pages but not the overall narrative.

Understanding of individual booklet pages did not necessarily translate into understanding of the overall narrative of the booklet. Priscilla, for example, clearly had some reading ability and was the only participant to understand the intended meaning of page 7. Even she, however, did not appear to understand that the main character was terminating a pregnancy, and instead, interpreted instances of bleeding as the woman's regular period. She described the pill illustrations as "family planning." Her interpretation of page 14 demonstrates that she did not read the text present on the page:

Priscilla: This woman is now taking medicine, when we come to the clinic we take medicine that helps us prevent being pregnant. A lot of women would like to take family planning so that they don't get pregnant.

One possible explanation is that she is unfamiliar with text presented in all caps.

Legibility studies support that text in upper and lowercase is easier to read (Paterson & Tinker, 1946).

Despite not understanding that the booklet was about abortion initially, Priscilla was very curious about Medabon, and asked questions about how the pills worked, where they were available and how much they cost after the think-aloud portion of the interview. She also raised concerns that her local clinic was overcharging.⁴

Priscilla: Do they charge for it?

Interviewer 2: Yes they do but the fee is very minimal.

Priscilla: I have asked because my neighbor once came here and she was told to bring 300,000 kwacha.⁵

Interviewer 1: Is that what the nurse said?

Priscilla: Yes.

Interviewer 2: That medicine is not supposed to be expensive though they do charge a minimal amount... then they over charge. It should not cost that much.

Interviewer 1: It shouldn't be expensive because people would rather go else...

Priscilla: ...where people die.

Interviewer 2: You know how people are. They want to put their own prices to exploit people.

Priscilla: So what are you going to do about it since you are the ones who have started this programme?

Interviewer 2: We are coordinating with the Ministry of Health.

Interviewer 1: Now that you have told us that they over charge here, we are going to inform those responsible of that and they will come and address the issue.

⁴ The issue of clinics overcharging for Medabon was also mentioned by the CBOs. The research team informed the Ministry of Health and the issue was resolved.

⁵ At the time of the interview, 300,000 kwacha was equal to approximately 62 US dollars. The annual per capita income in Zambia is 1,500 US dollars (US Dept. of State, 2010).

She was familiar with several of the contraceptive methods shown on page 15, but was very curious about those that were unfamiliar to her, particularly the patch, which she expressed an interest in trying.

Priscilla was one of the two participants currently in school.

Jurita: Understands primarily at the iconic level.

Other participants seemed to have very mixed understandings of the booklet. Jurita, for example, seemed to understand the intended meaning of page 4, at least to some degree:

Jurita: This one who is sitting here has blood.

Interviewer: Is that all you can see?

Jurita: I am not sure if she wants to terminate her pregnancy.

This is, however, the only reference to abortion that she makes during the think-aloud portion of the interview. For the majority of the pages, she just lists the items she can identify or does not comment:

Interviewer: Page 8?

Jurita: She is sleeping on the bed.

Interviewer: Is that all you can see?

Jurita: It's difficult for me to tell.

She describes the scene on page 15 in a way that suggests that she might interpret it as a prenatal appointment:

Interviewer: What do they look like they are doing here?

Jurita: Looks like she is being asked questions

Interviewer: What do you think she is being asked about?

Jurita: About being pregnant

During the follow-up questions, she clearly states that the booklet is about abortion:

Interviewer: Is there anything you don't like about this book that you think should not have been included?

Jurita: There is nothing I dislike about it

Interviewer: What do you like about it?

Jurita: What I liked about it is that you have to go to the clinic when you wish to have an abortion.

It is difficult to judge Jurita's overall understanding of the booklet based on her responses. She clearly does not understand some of the individual pages. She may or may not understand that the entire booklet is about abortion.

Gloria and Natasha: Most complete understanding of the booklet.

Gloria.

The two participants who appeared to have the highest levels of understanding were Gloria and Natasha. Gloria followed the narrative of the booklet throughout, connecting almost every scene to the main character's abortion. She was the only participant to make those connections on pages 7 and 9.

Interviewer: Page 7?

Gloria: Here it looks as though the medicine she was given at the clinic is for terminating the pregnancy so she is taking it.

On page 9, she connected the side effects to the abortion:

Interviewer: page 9? What do you think about this page?

Gloria: After terminating the pregnancy, she is feeling sick. She is experiencing side effects. Here she is vomiting, she has a headache, she has fever and here she has diarrhea.

Gloria is the other participant currently continuing her education.

Natasha.

Natasha also made the connection to abortion throughout the booklet. She was the only woman to explicitly link the main character's state on page 11 to an abortion:

Interviewer: page 11?

Natasha: I think here she is still experiencing pain in her stomach after aborting because she is holding her stomach and here she is sleeping again and then here, she

has decided to go to the clinic.

Natasha was one of the participants who knew the legal status of abortion. She did not make any stigmatizing comments regarding abortion and spoke of the legal status in positive terms:

Interviewer: did you know that abortion is legal in Zambia?

Natasha: I heard that it is allowed now and that is a good move.

She also observed that women might be afraid to seek help with terminations from the clinic:

Natasha: I have heard that at the clinic they help women who want an abortion but it's not yet common because most people still have fear.

Maggie: Influence of stigma.

Maggie made several stigmatizing comments early in the interview. Like many other participants, she referenced her Christian faith, but, unlike the others, she also referenced traditional beliefs surrounding abortion:

Maggie: Like the one I heard of, she stays some meters away. After her baby died, she conceived again, then aborted.

Interviewer: What did she use and where did she have the abortion done?

Maggie: I don't know. A child is the one who came to tell me that they were being told to bathe in medicine. Then I started wondering who had aborted. Then I was told that she had it done from the clinic. Then I wondered why a health institution could allow such an evil thing.

In response to the booklet, she tended to describe the visual elements without much speculation on their relationships to each other or to other pages. Like Jurita, she interprets page 16 as prenatal care. She does not appear to understand that the main character is aborting a pregnancy at any point during the think-aloud portion of the interview.

Maggie appeared to be strongly opposed to abortion at the beginning of the interview. However, by the end of the interview, after the intended meaning was explained, she made a

comment about how discussing abortion could be positive:

Interviewer: After going through this booklet, if a woman has taken medicine and she does not start bleeding, what can she do?

Maggie: Then it means the abortion was not successful.

Interviewer: What can she do?

Maggie: Go back to the clinic and explain that she took medicine for abortion but it didn't work.

Interviewer: Is there anything that you feel was left out in the booklet?

Maggie: No. Everything is fine.

Interviewer: Has anything been included which should not have been included?

Maggie: Everything is ok because these are things that happen to every woman. One other good thing is that this issue is being handled by fellow women so it becomes much easier for us to open up.

Despite her apparent objections to abortion, she appears to recognize that abortion is an issue that needs to be discussed by the women in the community.

Attitudes Towards Abortion in Zambia

Eighteen of the 20 participants knew someone who had had an abortion. Eight knew a woman who had died due to an unsafe abortion; four knew a woman who was injured by an unsafe abortion.

Priscilla: One that I know of died, after aborting she spent 3 weeks in UTH (University Teaching Hospital) and later died.

Interviewer: Do you know the whole story as to what really happened?

Priscilla: No, her relatives didn't say.

Interviewer: She was attempting to abort?

Priscilla: Uh-huh, she wanted to abort. I heard she went to a traditional doctor—those who insert sticks...

Interviewer: Those same traditional doctors are finishing people off.⁶

Priscilla: It also puzzles me, can one honestly poke you where they cannot see? It's our own foolishness as women.

Interviewer: How about the other one?

Priscilla: After she left the clinic, she kept it from her not only to realize that she was rotting in the womb. Only when she was examined, that's when they discovered that she was rotting.

Interviewer: Did she survive?

Priscilla: I don't know, she has not been discharged yet from UTH.

Interviewer: You just heard about what happened to her?

Priscilla: Uh-huh, her mother told us it happened recently.

Interviewer: So you don't know if she's alive or not?

Priscilla: If she died we would have heard. They say they had to operate where she was rotten but they just cut it out.

Participants' knowledge of the legal status of abortion.

The majority of participants were unaware that abortion was legal in Zambia. Six women thought it was illegal when asked, while nine responded "I don't know."

Four women did know that abortion was legal. When asked how she knew the legal status, one participant, Mavis, responded that she had seen a community drama about abortion:

Mavis: ...I have seen a drama performance on the same

Interviewer: Could you explain to us what it was about?

Mavis: It's was about a woman who had an unplanned pregnancy and can't afford to keep it so thinks it's better to go to traditional doctors to terminate it. That then it's better to go to the clinic to have it well done.

⁶ The interviewer is referring to clandestine abortion providers.

Interviewer: Could tell us what happened, just picture it so that we can also know what happened.

Mavis: The father of the child denied that he is the father of the child.

Another woman explained that she had heard abortion was legal on the radio:

Interviewer: Did you know that abortion is legal in Zambia?

Natasha: I heard that it is allowed now and that is a good move.

Interviewer: Where did you hear from?

Natasha: I heard that from the radio.

Several participants had heard from other women in the community that abortion was legal, but not all believed the information was truthful:

Grace: I just heard from people but I don't really know that it's legal.

Interviewer: Where do you hear that?

Grace: From people right here in the community.

Interviewer: Saying that it's allowed to have an abortion?

Grace: Uh-huh.

Interviewer: You just heard that?

Grace: I heard people arguing about it at CARE⁷, whether it was true or not but I finally realized that it was false information.

Stigma.

The stigma surrounding abortion was prevalent in the interviews. Negative attitudes toward abortion were evident in comments made by both participants and the interviewers.

Values clarification has been included in the interviewer training sessions and I had thought that both interviewers were comfortable discussing abortion and understood the importance of using neutral terms during the interviews. Nevertheless, the use of stigmatizing language by one of the interviewers, despite the training, demonstrates how strong attitudes against abortion are in Zambia.

⁷ CARE International is a non-governmental organization that runs poverty-reduction programs in Lusaka.

Interviewer: It's true, they do allow abortions.

Jurita: Oooohhh! (surprised)

Interviewer: If you get pregnant and can't keep it then you can have an abortion.

Jurita: Isn't it a sin?

Interviewer: It's a sin.

Jurita: But then why have they allowed people to have abortions?

Interviewer: Because they have realized that people do it anyway and because women are dying and having complications so it's better they are assisted by having an abortion in a suitable manner.

Many of the women referenced religious beliefs, framing abortion in negative terms:

Interviewer: Why do you think it's not legal?

Jennifer: That is murder and Zambia is a Christian nation so I know that the government does not allow it.

Despite the stigma and negative attitudes surrounding women who abort, there was also a recognition of the dangers of unsafe abortion and a concern for women's lives.

Interviewer: Why do you think that abortion is not legal?

Geraldine: Because abortions kill. Many people who abort do not survive after aborting.

Jurita expressed a similar thought:

Interviewer: Do you think a woman terminating a pregnancy can follow the instructions in this book?

Jurita: They can follow it because they know that if they use the shortcut they will die.

The majority of the participants had seen the impact of unsafe abortion in their communities, resulting in death or injury to women they knew. Their personal experiences with abortion in an environment with a strong social stigma may explain the dissonant reactions that many participants expressed about abortion:

Interviewer: Everything, isn't there anything that you don't like about this book?

Liz: The main reason I like this book is because when one is found pregnant she has an alternative of going to the doctor for help. This book is clear, it's better than going to friends who may give wrong advice. This book is very educational, if only such a book was available way back a lot of people would not have died, they would have been helped. They go to traditional doctors thinking they spend less money and are scared of going to the doctors thinking they will ask them to pay a lot of money. So if this help could be free so that many people can be helped, it's really not murder but just a way of helping women.

Interviewer: Isn't there anything that you don't like about this book?

Liz: It has taught me a lot and am very happy that you have showed me this book because when I heard about that women who went to Kafue hospital being admitted for two days as well as being on treatment. If she knew about this, she would have aborted in a safer way. Where she went there, she was charged a lot of money to clean her womb as well as to scan it, meaning she spent more than she was going to spend at the clinic had she gone there. This is one way that is going to help people through I know that having an abortion is killing a human and I am a Christian.

Participants' Suggestions

One theme that emerged from participants' comments on the effectiveness of the booklet was the need for an explanation to accompany it.

Interviewer: Do you think someone wishing to terminate a pregnancy can understand these steps very well?

Jennifer: Yes they can. When they come to the clinic, and have someone to explain to them, like peer educators, the whole process/ take them through the booklet before you give it to them to read on their own, they can follow it very well.

Eight participants mentioned the need for the booklet to be explained before women in their community could use it.

CHAPTER 4

Discussion

A picture is worth a 1,000 words, and that is precisely the problem that communicators face when relying on visuals to convey health messages. Each image may have many different interpretations, depending on the viewer. Images are not a universal language.

Clinical information, particularly instructions on how to take medication, must be conveyed clearly and precisely to protect patients' health. The *Ending Pregnancy with Pills* booklet contains clinical instructions on how to take the pills and when to seek emergency care for side effects of a medical abortion. Whether women understand this information to the level needed to safely follow the instructions is questionable. There was considerable confusion surrounding the specific dosage instructions given on page 7. The majority of women did not understand when or how to take the second dose of pills. While most women seemed to understand that they should seek care from the clinic if they were not feeling well, many did not fully understand that the symptoms represented—heavy bleeding, vomiting, diarrhea, fever and headache—were potential side effects of the abortion pills.

When asked at the end of the interview, several of the women thought the booklet could be followed safely, however, the findings indicate potential for serious misunderstandings. The root of many of these potential misunderstandings is the use of visual conventions that are unfamiliar to the intended audience or that require interpretation strategies with which the audience does not have much experience.

Many of the women who participated in the study appeared to have difficulties constructing a coherent narrative for the booklet as a whole. This may stem from a lack of familiarity with the convention of the picture book. The “listing” technique used by many women to describe the visual elements on the page without placing them within a broader

context could indicate that the women were not building the narrative links between images or pages required for fully comprehending the booklet.

Familiarity was an important component of understanding. The women recognized images that depicted items or scenes they were familiar with, such as condoms or birth control pills on page 15, but struggled with visual elements that were not common in their everyday experiences, such as the diaphragm or patch illustrations, or even the sanitary napkins. In some cases, the interpretations of unfamiliar elements influenced the women's understanding of the message. Several women interpreted the thermometer in the fever symptom image as a toothbrush, for example, which may have affected their missing that the page was portraying potential side effects from the abortion pill.

Symbolic elements, such as thought balloons or arrows, were not easily understood by the majority of women. These elements relied on cultural associations or knowledge unfamiliar to the intended audience and required more abstract interpretation strategies, connected to higher levels of education by Maes et al. (2008). The women who appeared most comfortable with symbolic interpretation strategies included the two, Priscilla and Gloria, who were currently enrolled in school and Jennifer, who reported enjoying novels and aspired to continue her education:

Jennifer: I have a novel called "Think Big."

Interviewer: What inspires you about "Think Big?"

Jennifer: I made it to grade 10 but I have no sponsorship to continue with my school so when I read that book, I feel so happy because what I wanted to do is in the book.

Images requiring symptomatic interpretation strategies had mixed results. Some images, such as facial expressions indicating an emotional state, were direct and generally easily understood. Others, such as the pregnancy symptoms on page 2, required participants to make a connection between different visual elements, a more abstract level of interpretation that not all participants appeared comfortable with.

Conveying abstract concepts and relationships frequently impeded participants'

understanding of the booklet, both on a page level and overall. Concepts, such as thinking, and relationships, such as cause and effect or possible outcomes of an event, were not understood by many of the women. Often visual elements intended to convey abstract concepts or relationships were ignored by participants who had no basis for making meaning from them.

The progression of time was an abstract concept essential to the understanding of several pages in the *Ending Pregnancy with Pills* booklet, most notably, the pages with clinical information. Two different strategies were used to convey the progression of time: iconic and extra-pictorial. Many illustrations combined the two strategies. The women in the study appeared to understand the iconic indicators of time—the sun and the moon—more than the extra-pictorial indicators—the arrows.

Implications for Theory

Iconic representations of the passage of time.

Hoogwegt et al. (2009) concluded that iconic strategies are more successful than extra-pictorial strategies as indicators of the abstract concept of motion for low-literacy audiences. This study's findings suggest expanding the theory to also include the abstract concept of time. Images that used iconic indicators to convey the passage of time were understood by more participants than images that used extra-pictorial strategies.

Iconic strategies for conveying time appear to be better suited to more concrete, easily experienced units of time. The more successful examples in this booklet all use days as the unit of measurement. Finding a suitable iconic representation for smaller units of time, such as hours or minutes, would require formative research in the target community to establish what local methods of measuring those units of time are.

The clock illustration on page 7, which attempts to indicate the passage of 30 minutes, fails to successfully communicate, despite being recognized by all the participants. They recognized the convention and understood that the clock was meant to represent time, but the interval aspect of the illustration was not communicated well. This appears to be more a

failure of the illustration rather than a misunderstanding stemming from unfamiliar visual conventions.

The cultural basis of visual conventions and symbols.

The findings clearly support theories on the culturally constructed nature of visual conventions. Interpretations of symbolic visual elements, in particular, show that audiences unfamiliar with the culturally based meanings of those symbols (e.g. the exclamation mark warning symbol) are less likely to interpret them as intended.

The difference between those with knowledge of a symbol's associated meaning and those without can be seen in the different responses to the thought balloon visual element. The majority of women ignored the element; it was unfamiliar to them and therefore, conveyed little meaning. One woman, Jennifer, appeared to be in the process of forming an associated meaning for the symbol, however. She tested and confirmed her knowledge over the course of her responses to pages 2–4 (see page 31–2).

On page 2, she understood that the main character is thinking, but she did not indicate what cues prompted that interpretation. On page 3, she asked “she is still thinking?” perhaps to seek confirmation from the interviewer that her interpretation was correct. By page 4, she has concluded that the thought balloon is a visual symbol that not only denotes “thinking” but also acts as a visual device to let the viewer know what the thoughts are.

Messages that require viewers to construct meaning either through abstract connections between elements on the same page (e.g. the pregnancy symptom insets on page 2) or through abstract connections between pages (e.g. the side effects experienced by the main character were caused by the abortion pills) were challenging for this low-literacy audience.

Maes et al. (2008) found that low-literacy audiences were less likely to get the intended meaning when more abstract interpretation strategies were required. This study's findings support Maes et al.'s conclusion that education level influences an individual's ability to make those abstract connections.

Complex visual structures.

The booklet relies on combinations of elements in larger visual structures to convey complex messages. These visual structures require multiple levels of interpretation to understand the intended meaning. For example, for a viewer to understand that the inset images of pregnancy symptoms on page 2 (see Figure 22), are indicators that the main character is pregnant, she must first use iconic interpretation strategies to recognize the individual symptom illustrations. Each symptom illustration is presented from a different perspective. The pregnancy test and breast tenderness images require the viewer to understand the convention of cropping an image to show part of a larger whole. The viewer must also understand that the woman presented in all three inset images is the same woman in the main image. This is another visual convention that she may or may not be familiar with, requiring her to interpret the format of the image—inset from the main image—in a symbolic way. Then she must apply symptomatic interpretation strategies—

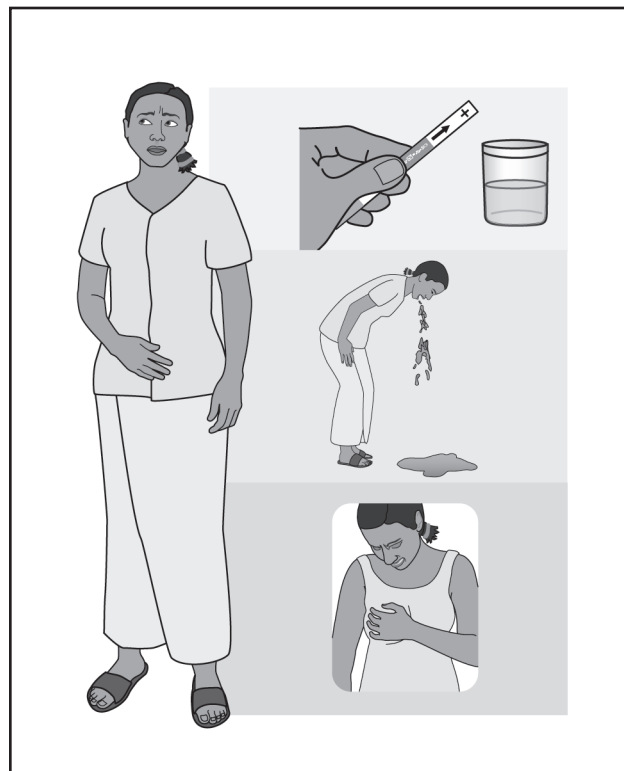


Figure 23: Detail of pregnancy symptom illustrations, page 2

ostensibly the most basic level of interpretation—to realize that the scenes portrayed in the inset images are signals that the main character is pregnant. The thought balloon elements add several additional layers of complexity to the overall image on the page.

No single interpretation strategy is enough to understand the complete message of page 2 or the majority of pages in the booklet. Complex visual structures require viewers to interpret elements on multiple levels, using multiple interpretation strategies. Some viewers can do this, others cannot and get stuck at one level of interpretation—the most concrete—without processing the additional layers of meaning. This may explain why many of the women who participated in the study listed the visual elements they could identify on the page without connecting them to a larger narrative. They could understand the images at an iconic level—identifying what each literally represented— but could not or did not take the next step in interpretation.

Overall, this study supports theories on the cultural basis of visual conventions and the difficulties that low-literacy audiences face when more abstract interpretation strategies are required. This is particularly true in the case of complex visual structures which may require the application of multiple interpretation strategies to individual visual elements.

Implications for Practitioners

This study's findings emphasize the importance of formative research and pretesting in the development of visual communication materials, particularly for clinical health information. Miscommunications can have serious health consequences so public health practitioners need to be sure that they are communicating their intended message in a clear, understandable way.

Participatory methods are an ideal way to ensure that communications-based health interventions are sensitive to the needs of the local population, particularly when trying to reach low-literacy audiences who may not have many channels to express their needs. Nidadavolu and Braken (2006) used participatory drawing methods to develop health communication materials for low-literacy audiences in Rajasthan, India. Local groups

worked with Lakshmi Murthy, a visual communications specialist, to develop their own visual vocabularies on reproductive health. The resulting symbols were based on local knowledge, making them recognizable and relevant to local audiences. While focus groups were used to provide some in-progress feedback, the *Ending Pregnancy with Pills* booklet was not developed using true participatory methods.

Institutional barriers—including donor requirements, funding cycles, the role of communications professionals within the organizational structure and concerns about involvement in local politics—often prevent organizations from engaging in participatory research (Waisbord, 2008). If the obstacles are insurmountable, organizations may try to develop materials centrally. While formative research and evaluation are still a necessary component for successful, organizations can use the following recommendations to inform their materials development process.

Symbolic images, such as the exclamation symbol or thought balloon, which require knowledge of culturally based associations and the familiarity with more abstract interpretation strategies, should be avoided when possible. Locally used symbols are an exception, but require creators to have a high level of familiarity with the local visual culture. Iconic strategies for conveying motion and time are more effective than extra-pictorial and should be the first choice for depicting this type of abstract information.

Creators of low-literacy materials should limit the number of concepts presented on each page and in each publication. The *Ending Pregnancy with Pills* booklet tries to include information on options counseling, taking the pills, potential side effects and post-abortion contraception all in the same document. The options counseling section, which uses very complex visual structures, was particularly overwhelming to the women. More publications with less information in each one may offer a more successful alternative.

Multiple publications also offer the option of tailoring information to the setting it would be used in. For example, a woman who has already the first dose of Medabon does not need an options counseling brochure to take home, she needs instructions on how to take the

next dose and monitor for side effects. Separating the information into smaller segments would allow health care providers to give a patient the information most relevant to her specific situation.

Practitioners also need to be aware of the limitations of this type of communication. Visually-based materials are not always the best choice. As the results show, it is often difficult to convey complex relationships using images alone. Viewers may not make the intended connections between images within a page or between pages.

Creators need to consider the context in which the materials will be used. In the case of the *Ending Pregnancy with Pills* booklet, a provider should be available to explain the booklet to patients. Therefore, designing the materials to be more of a visual memory cue is a potentially effective strategy (Dowse & Elhers, 2005; Houts et al., 1998; Houts et al., 2001). Approaching the booklet as a memory cue might reduce some of the need for the complex visual structures intended to explain complicated cause-and-effect relationships or detailed, time-based instructions.

Overall, practitioners need to be aware of their assumptions, especially if they are creating materials for use in a culture outside of their own. Visual conventions are naturalized within cultures, making them easy to overlook or take for granted. Any materials that will be used cross-culturally need extensive pretesting and formative research.

Limitations

All but one of the participants in this study had some level of formal education and many had at least some reading ability. The study was conducted in communities near Lusaka (see Figure 4), an urban area where people tend to have greater access to educational resources and media than residents of rural areas. Women in areas without the same level of access may have a more difficult time understanding the visual conventions in the booklet, due to differences in their cultural knowledge.

Due to language and cultural barriers, I was not able to conduct the interviews personally. I trained two local research assistants to conduct the interviews. They also

translated and transcribed the collected data from the local languages—primarily Nyanja and Bemba—into English. The translation and transcription process increased the possibility of errors in the data, making analysis based on specific word choice unreliable. Also, because of the cultural differences, subtle meanings may be lost.

To compensate for these limitations, I was conservative in the data analysis and did not base any conclusions on potentially unreliable word selection. For example, there is some evidence that would indicate that women were not interpreting the different representations of the main character on a single page as the same woman. This conclusion hinges on specific phrases—“this one” and “that one”—which are susceptible to differences in translation, making it impossible to draw any definitive conclusions on this subject.

The interviewers, while local, were of a different social class, better educated and younger than the majority of the participants. This may have made some of the participants feel uncomfortable or hesitant to be completely honest in their responses. Conversely, knowing that the interviewers were not members of the immediate community, and hence, unlikely to spread information imparted in confidence to others, may have made some participants feel more at ease disclosing personal stories. The interviewers attempted to make the participants feel respected and comfortable through their language and dress.

The interviewers, despite receiving research ethics and values clarification training, did sometimes allow the general stigma surrounding abortion in Zambian society to influence their responses to the participants’ questions and statements. This may have biased the results, encouraging participants to repeat stigmatizing statements or may have intimidated participants.

In a few instances, one of the interviewers asked leading questions. Since all the interviews had been completed before I received transcripts, nothing could be done to correct the issue. In the analysis, data that could have been influenced by the leading question was discounted.

The think aloud technique was successful in eliciting the participants' initial impressions of the booklet, but once the interviewer had explained the intended meanings of the pages, most participants declined to offer any additional feedback on the images, deferring to the "expert" opinion instead. According to Freire (1970), the banking system of education and the power dynamics of an oppressive society can lead people to distrust their own knowledge and insights about the world, in favor of blindly agreeing to the views presented by powerful authorities. In the case of this study, the women—oppressed by low educational access and limited power over their own lives—may feel that they can not criticize the perceived authority who created the materials. Participatory methods would be a more effective methods of eliciting feedback and avoiding the external authority issue.

Directions for Future Research

Future research should be conducted to evaluate the understanding of these materials with women who have less education or lower literacy skills and with rural populations. Studies evaluating the booklet in other cultures would also be informative.

Additional research should also be conducted to further test how low-literate audiences understand images conveying the progression of time in static graphics, comparing the effectiveness of iconic and extra-pictorial strategies to depict different units of time including days, weeks, and hours.

While this study supports Kostelnick and Hassett's (2003) theory of discourse-community-defined visual conventions, it does not point to a clear conclusion about how these discourse communities develop or how visual conventions might spread. Visual media may play a role. Further research should explore the effect of exposure to visual media, such as television, on understanding of specific visual conventions.

The interview questions about media use generated very specific data, including references to specific television and radio shows, magazines and advertisements. The media-use information was excluded from this analysis due to my lack of familiarity with the media mentioned. Future research, done in collaboration with researchers more familiar

with popular media from Zambia and other African countries, could offer insights into potential connections between visual media use and familiarity with visual conventions.

Further research on participatory drawing methods for development of health materials would also be valuable.

Conclusion

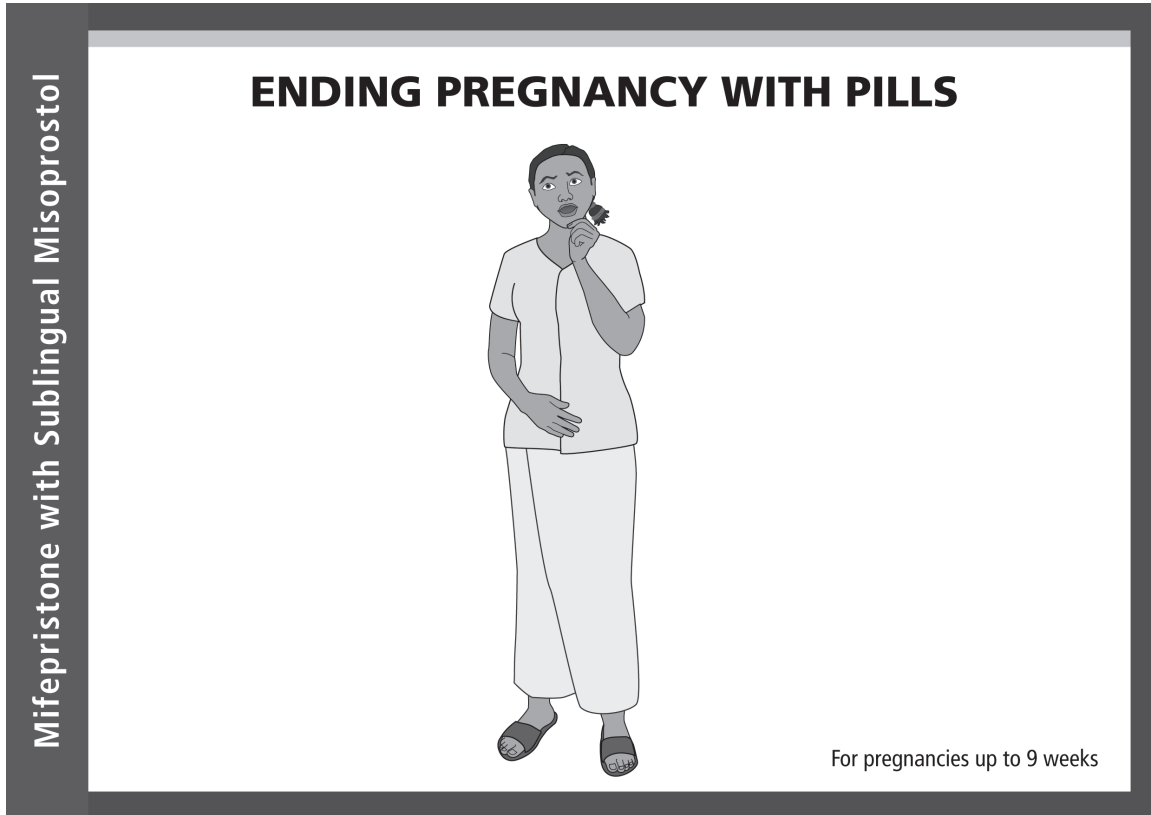
Visual communication offers a potential path for reaching low-literate audiences, but it is not a quick or easy option. Without extensive formative research, pretesting and evaluation, image-based health communication materials have the potential for dangerous misunderstandings. Practitioners who want to use this type of intervention cannot afford to cut corners during the development process. If done well, however, image-based materials offer an opportunity for low-literate individuals to learn more about their own health and to be empowered to seek the services they need.

While the *Ending Pregnancy with Pills* booklet needs extensive adaption before it could be safely used in Zambia, the women interviewed seemed to think that it had the potential to be a valuable tool in efforts to reduce maternal death and injury in the country. It is clear that unsafe abortion has touched their lives and, despite the existing stigma, it is a topic they feel needs to be discussed. As Liz said:

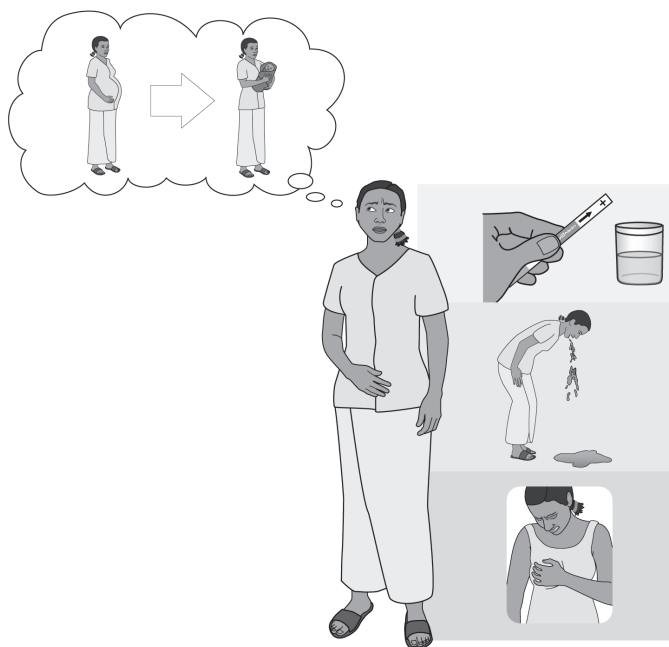
...these are things that happen to every woman. One other good thing is that this issue is being handled by fellow women so it becomes much easier for us to open up.

APPENDIX A:

Ending Pregnancy with Pills Booklet



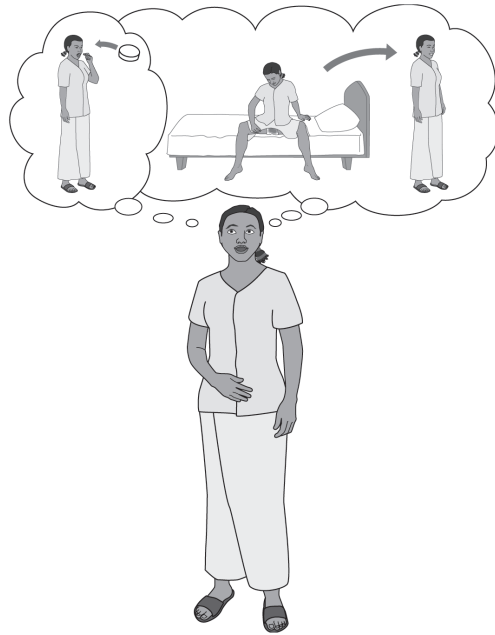
AM I PREGNANT?



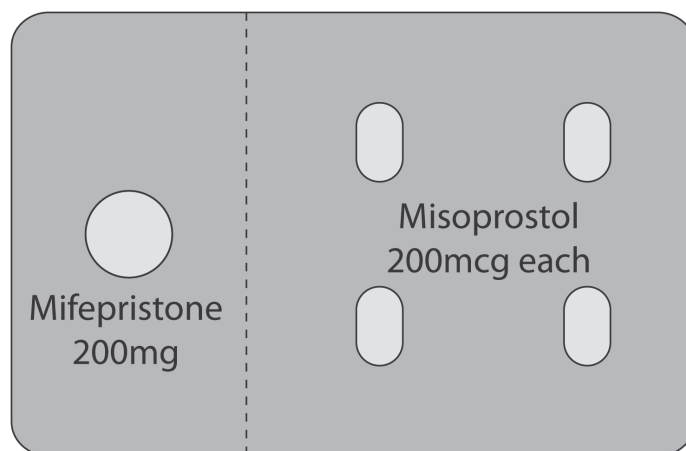
I DON'T WANT TO BE PREGNANT!




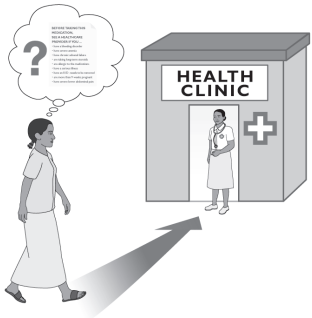

CAN I TAKE PILLS TO END PREGNANCY?



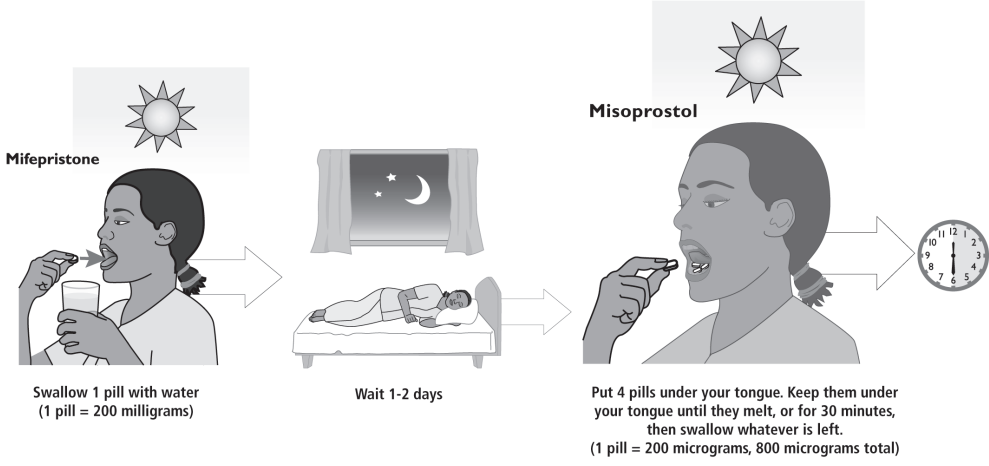
WHAT ARE THE PILLS?



WHAT SHOULD I DO BEFORE TAKING THE PILLS?

1	2	3
 <p>BEFORE TAKING THIS MEDICATION, SEE A HEALTHCARE PROVIDER IF YOU ...</p> <ul style="list-style-type: none"> • have a bleeding disorder • have severe anemia • have chronic adrenal failure • are taking long-term steroids • are allergic to the medications • have a serious illness • have an IUD - needs to be removed • are more than 9 weeks pregnant • have severe lower abdominal pain 		

HOW DO I TAKE THE PILLS?



Mifepristone

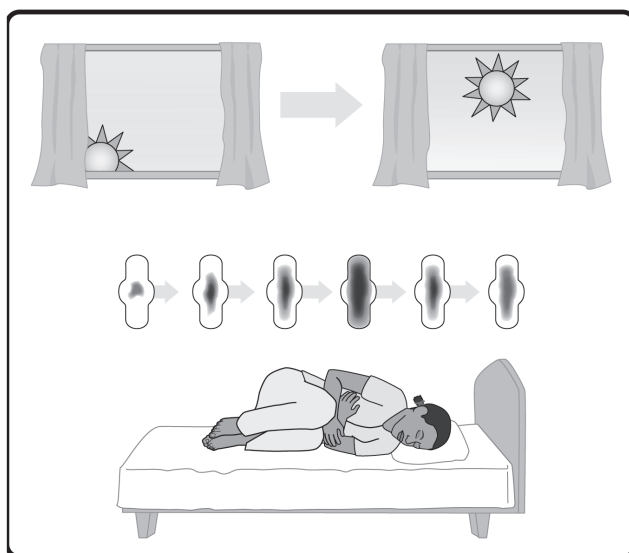
Swallow 1 pill with water (1 pill = 200 milligrams)

Wait 1-2 days

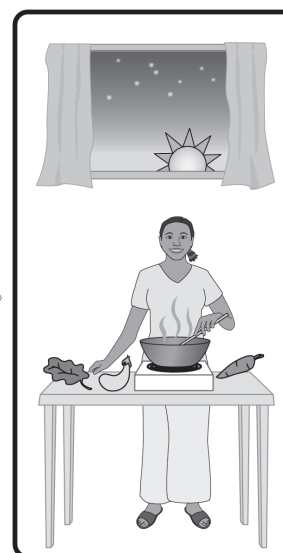
Misoprostol

Put 4 pills under your tongue. Keep them under your tongue until they melt, or for 30 minutes, then swallow whatever is left. (1 pill = 200 micrograms, 800 micrograms total)

WHAT WILL HAPPEN?



BLEEDING AND CRAMPING



FEELING BETTER

WHAT ARE THE POSSIBLE SIDE EFFECTS?

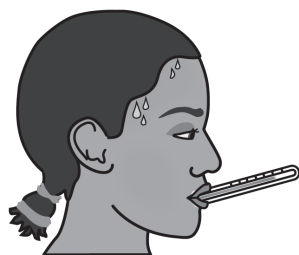
VOMITING / NAUSEA



HEADACHES



FEVER / CHILLS



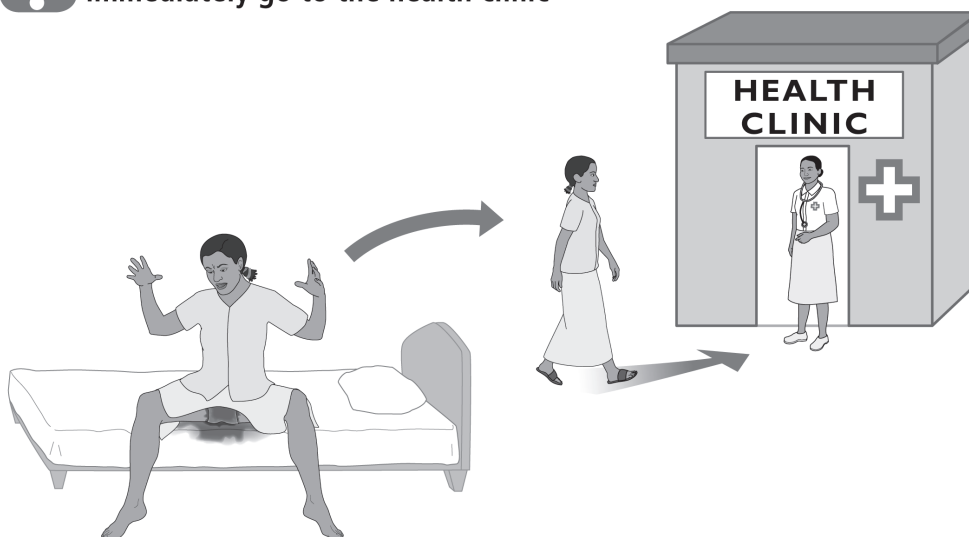
DIARRHEA



GO TO THE HEALTH CLINIC IF YOU HAVE...



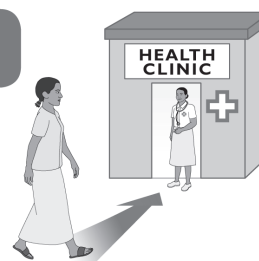
HEAVY BLEEDING
immediately go to the health clinic



GO TO THE HEALTH CLINIC IF YOU HAVE...

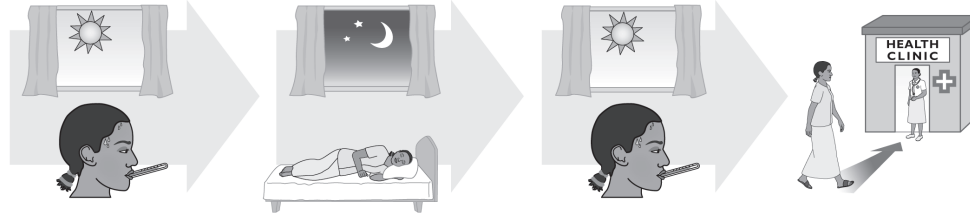


SEVERE PAIN/SICKNESS FOR MORE THAN A DAY
immediately go to the health clinic

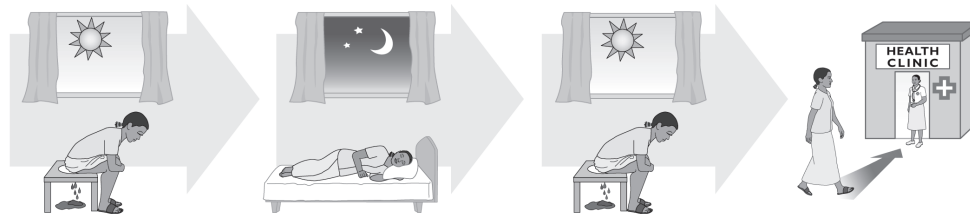


**GO TO THE HEALTH CLINIC IF SEVERE SIDE EFFECTS
LAST MORE THAN A DAY**

! FEVER / CHILLS

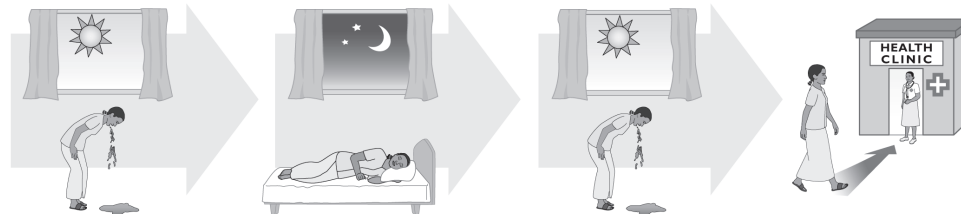


! DIARRHEA

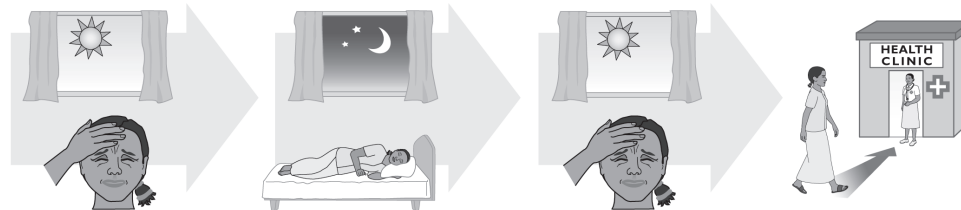


**GO TO THE HEALTH CLINIC IF SEVERE SIDE EFFECTS
LAST MORE THAN A DAY**

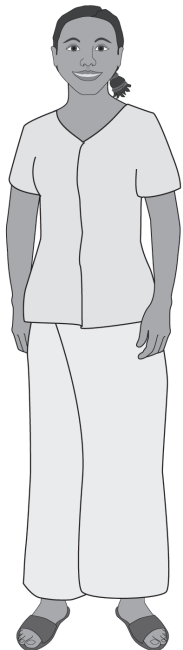
! VOMITING / NAUSEA



! HEADACHES



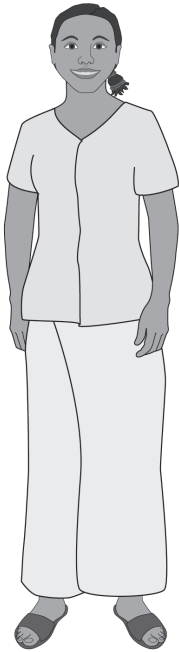
WILL I BE SUCCESSFUL IN ENDING MY PREGNANCY?



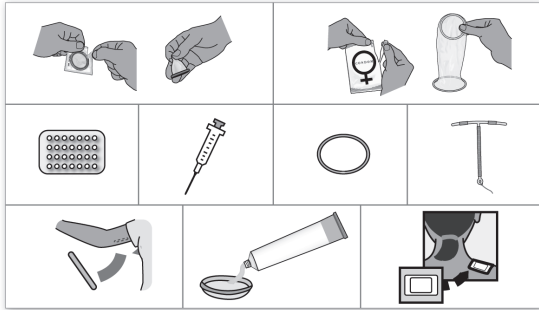
MOST WOMEN USING THESE PILLS TO END THE PREGNANCY HAVE A SUCCESSFUL ABORTION WITH NO PROBLEMS.

Only 2 out of 100 women will need further care to end the pregnancy.

Only 2 out of 100 women will need further care to end the pregnancy.




WHAT CAN I DO TO AVOID FUTURE PREGNANCY?

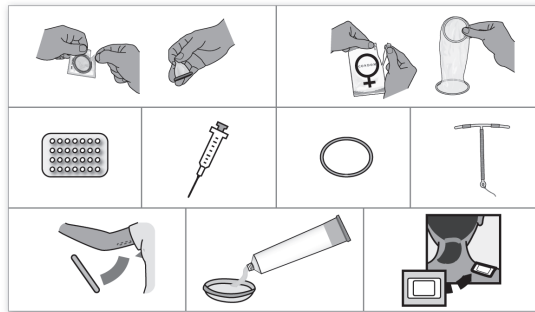


The grid contains the following icons:

- Top-left: Hands holding a small pill.
- Top-middle: A hand holding a small vial with a needle.
- Top-right: A hand holding a condom.
- Middle-left: A blister pack of pills.
- Middle-middle: A syringe.
- Middle-right: A circular IUD.
- Bottom-left: A diaphragm and a small packet.
- Bottom-middle: A tube of spermicide being applied to a diaphragm.
- Bottom-right: A box of emergency contraception.



The illustration shows a healthcare provider, likely a nurse or doctor, wearing a white uniform with a cross on the chest and a stethoscope. They are sitting at a table, facing a patient. The patient is a woman with dark hair, wearing a light-colored top, and is looking towards the healthcare provider. The background is a simple, light-colored wall.





RETURN FOR YOUR FOLLOW-UP VISIT ON:

_____/_____/_____



QUESTIONS? CALL:



IN CASE OF EMERGENCY, GO TO THE NEAREST HOSPITAL

MALBKMMIS-E10

APPENDIX B:
Interview Guide

Interview Guide

Begin with the demographic form.

Media Use Questions

I would like to know how you use media (TV, radio, magazines) and what you think about it. I'm going to ask a series of questions about different kinds of media. There are no right or wrong answers. I am interested in your habits and opinions.

1. Do you listen to the radio? If yes:
 - a. how frequently?
 - b. Is there a radio in your household? If no, where do you listen to the radio?
 - c. What programs do you listen to?
 - d. What programs are your favorites?
2. Do you watch television? If yes:
 - a. how frequently?
 - b. Is there a television in your household? If no, where do you watch television?
 - c. What programs do you watch?
 - d. What programs are your favorites?
3. Do you watch movies? If yes:
 - a. How frequently?
 - b. Where?
 - c. What movies do you watch?
 - d. What movies are your favorites?
4. Do you see advertising? If yes:
 - a. Where?
 - b. What advertisements do you remember?
 - c. Are there any that you particularly like or dislike?
5. Do you ever read magazines? If yes:
 - a. How frequently?
 - b. What magazines do you read?
6. Do you own any books? If yes, what kind?
7. If you have children, do they have any books? What kind?
8. Have you ever used the internet?

9. Do you make any crafts (basket-making, sewing, tie & dye)?
 - a. Where did you learn your craft skills?
10. Where do you get health information, such as information on malaria or caring for children?
 - a. Do you ever get health information from the media?

Abortion Questions

Now I'd like to ask you some questions about specific health topics. As you know, this study is about sexual and reproductive health, including abortion. I know this can be an uncomfortable subject for some people and I want to assure you that your responses will be kept confidential. Please answer honestly. I am interested in your thoughts and opinions.

1. We just spoke about general health information. Where do you get information about reproductive health, including family planning?
2. Are family planning methods easily accessible in your community?
3. Do many women face unplanned pregnancies in your community?
4. If a woman were facing an unplanned pregnancy, who would she turn to for help or advice?
5. Do you know of anyone who has terminated a pregnancy?
 - a. Potential follow-up: do you know of anyone who has died or been injured while attempting to terminate a pregnancy?
6. Why do you think a woman might seek an abortion?
7. If a woman was thinking about aborting a pregnancy, where would she go for information about abortion?
8. Where would she go for help with an abortion procedure?
 - a. Where should she go?
9. Do you know if abortion is legal in Zambia?

Think-Aloud Questions

Abortion procedures are allowed in Zambia if the pregnancy causes:

- risk to the life of the woman;
- risk of injury to the physical or mental health of the pregnant woman;
- risk of injury to the physical or mental health of any existing children of the woman;
- or if there is substantial risk of fetal malformation.

Doctors are concerned that too many women are dying or suffering injuries because of unsafe abortion procedures. In an effort to stop these deaths, this booklet has been developed to help women who have decided to terminate a pregnancy. It would be given to a woman by her doctor.

I am going to show you the booklet page by page. I'd like you to describe what is happening in the pictures. Tell me what you think the story is. If anything is confusing to you or you don't recognize what is being shown, please say so. Are you ready to begin?

The interviewer will show the book to the participant, one page at a time, being sure to give the participant ample time to explore the entire page. The interviewer will ask follow-up questions for clarification.

Let's start with the cover. What do you think about this woman?

Now we'll turn to the next page. Please describe what is happening on this page.

Proceed through the booklet. Do not correct or clarify what the images are supposed to depict for the participant. Let the participant set the pace.

Now, I'd like to go back through the booklet. I will tell you what the doctor intended to communicate on each page and you can tell me if you think anything could be improved to tell the information in a better way. Are you ready to begin?

Explain the intended meaning of each image and ask the participant if she understood that message from looking at it. Ask her if anything could be done to make that message more clear. Paper and drawing implements should be provided if the participant would like to make a sketch.

Page 1: *Cover*

This woman is worried that she might be pregnant.

Page 2: *Am I pregnant?*

The woman is experiencing symptoms of pregnancy, including breast tenderness and nausea. She has taken a pregnancy test. She thinks she is pregnant.

Page 3: *I don't want to be pregnant!*

The woman decides she does not want to be pregnant.

Page 4: *Can I take pills to end pregnancy?*

The woman is thinking about taking a pill to end her pregnancy.

Page 5: *What are the pills?*

This is what the pills look like. They come in a package like this. There is one big one and four small ones.

Page 6: *What should I do before taking the pills?*

This is a list of reasons why a pill might not be appropriate for the woman, including if she has:

- a bleeding disorder
- severe anemia
- chronic adrenal failure
- a serious illness

- severe lower abdominal pain
- has been taking long-term steroids
- is allergic to medications
- has an IUD
- or is more than 9 weeks pregnant.

If the woman has any concerns or questions, she should see a doctor. The doctor will give her the first pill at the clinic.

Page 7: How do I take the pills?

First, the woman takes the large pill with a glass of water. She waits 1-2 days. Then she takes the four small pills. She places all four pills under her tongue at once and lets them dissolve. After 30 minutes, she should swallow what is left of the pills.

Page 8: What will happen?

After taking the four small pills, the woman will experience cramping and bleeding. The bleeding will get heavier but should taper off by the end of the day. She should be feeling better by evening.

Page 9: What are the possible side effects?

The woman could experience side effects, including vomiting/nausea, headaches, fever/chills or diarrhea. She could experience all or just a few.

Page 10: Go to the health clinic if you have...

If the woman is bleeding heavily, she should see her doctor.

Page 11: Go to the health clinic if you have...

If the woman is in pain or feels sick for more than a day, she should see her doctor.

Page 12/13: Go to the health clinic if severe side effects last more than a day

If the woman experiences fever/chills, diarrhea, vomiting/nausea or headaches for more than a day, she should see her doctor.

Page 14: Will I be successful in ending my pregnancy?

Most women using these pills to end the pregnancy have a successful abortion with no problems. Only 2 out of 100 women will need further care to end the pregnancy.

Page 15: What can I do to avoid future pregnancy?

The woman is consulting with her doctor about birth control options. The doctor shows her a chart with the following options:

- male condom
- female condom
- birth control pills

- birth control injection
- vaginal ring
- IUD
- birth control implant
- diaphragm with spermicide
- birth control patch

Page 16: *Return for your follow-up visit on*

This page has a place to write the date of the woman's follow-up visit with her doctor. This space is where she should write the contact information of the health clinic in case she has questions. This space tells her where to go if she has an emergency.

1. Based on this, what do you think the woman in the booklet should do if she takes the pills according to the directions on page 6, but she does not have any bleeding at all?

This question is to check to see if the participant would recommend taking more pills. Taking additional pills could cause very dangerous side-effects, so if the participant answers that she would recommend the woman take additional pills, explain that the woman should go to the doctor in this situation at the end of the questions.

2. What did you think of this booklet overall? Was it clear?
3. Do you think a woman who was terminating a pregnancy could follow this booklet in a safe way?
4. Is there anything that you particularly like or dislike about the booklet?
5. Is there anything that you feel was left out of the booklet? How about anything that is included that does not need to be?
6. Is the information in this booklet trustworthy?
7. Does it look like something that would be used in your community?

Thank you for your participation in this study. Your contributions are appreciated and will be very helpful.

APPENDIX C:

Participant Demographic Information

ID	Pseudonym*	Location	Age	Marital status	Children	Education Level	Reading Ability**
01-01	Geraldine	Chipata	31	married	3	grade 8	
01-02	Grace	Chipata	38	married	4	grade 7	some ability
01-03	Flaviour	Chipata	32	married	4	grade 7	
01-04	Jennifer	Chipata	19	single	0	grade 9	can read
01-05	Priscilla	Chipata	36	married	4	grade 9†	can read
01-06	Gloria	Chipata	38	widow	3	grade 9†	some ability
01-07	Mavis	Chipata	29	living with partner	2	grade 9	
01-08	Jean	Chipata	28	widow	2	grade 8	
01-09	Emma	Chipata	35	divorced	2	grade 7	
01-10	Winnie	Chipata	33	married	3	grade 7	
02-11	Ruth	Chilanga	29	divorced	3	grade 9	
02-12	Edna	Chilanga	22	married	1	grade 7	some ability
02-13	Liz	Chilanga	34	divorced	4	grade 9	
02-14	Natasha	Chilanga	27	married	3	grade 9	can read
02-15	Jurita	Chilanga	33	living with partner	6	grade 7	
02-16	Elisha	Chilanga	18	single	0	grade 9	
02-17	Maggie	Chilanga	39	married	10	grade 7	
02-18	Blessings	Chilanga	30	married	3	grade 9	
02-19	Dora	Chilanga	21	married	2	grade 9	some ability
02-20	Paloma	Chilanga	23	divorced	2	no formal education	

* pseudonyms were used to protect participants' anonymity

** as assessed by the interviewers

† currently in school

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