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Validation of A Pregnancy Planning Measure for Arabic-Speaking Women

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An abstract of
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Abstract

Validation of A Pregnancy Planning Measure for Arabic-Speaking Women

By Eman Almaghaslah

Background: The planning status of pregnancy has been widely evaluated, but less in Arabic speaking countries. In particular, The London Measure of Unplanned Pregnancy (LMUP) has been applied and validated in many regions and languages, but not to Arabic.

Objective: To conduct a psychometric evaluation study of the Arabic version of the London Measure of Unplanned Pregnancy (LMUP).

Methods: We conducted a self-administered online survey that included 796 ever-married Saudi women aged 20-49 years. We evaluated the psychometric properties including content validity using the content validity index (CVI), structural validity using exploratory factor analysis (EFA), and substantive validity using hypothesis testing, contextual stability for the test-retest using weighted Kappa, and internal consistency using by Cronbach's alpha.

Results: The Arabic LMUP version psychometric analysis exhibited valid and reliable properties. The CVIs for individual items and at scale level were > 0.7. EFA confirmed a unidimensional extraction of the scale item. Hypothesis testing confirmed expected associations. The tool was stable with weighted kappa = 0.78, and Cronbach's alpha = 0.88.

Conclusion and recommendations: In this study, the validity and reliability of the Arabic version of the LMUP were confirmed according to internationally-accepted psychometric criteria. This LMUP version can be used in research studies among Arabic-speaking women to measure unplanned pregnancy and investigate correlates and outcomes related to pregnancy planning.

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List of Abbreviations

ANC	Antenatal care
AOR	Adjusted odd ratio
CDC	Centers for Disease Control and Prevention
CI	Confidence interval
CUPTD	Contraceptive Use, Pregnancy Intention and Decision
DHS	Demographic and Health Survey
EFA	Exploratory Factor Analysis
FP	Family planning
I-CVI	Content validity index for individual item
IMR	Infant mortality rate
IPV	Intimate partner violence
IQR	Inter quartile range
KMO	Kaiser-Meyer-Olkin test
LMUP	London Measure of Unplanned Pregnancy
MENA	Middle East and North Africa
MMR	Maternal mortality rate
NSFG	National Survey of Family Growth
OR	Odd ratio
PAF	Principal Axis Factoring
PAPFAM	Pan Arab Population and Family Health
PHC	Primary health care center
PRAMS	Pregnancy risk Assessment Monitoring System
PRO	Patient reported outcome
S-CVI	Content validity index for scale
SD	Stander deviation
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
UNFPA	United Nations Population Fund Activities
US	United States

Psychometric Definition

"Psychometrics is a scientific discipline concerned with the construction of assessment tools, measurement instruments, and formalized models that may serve to connect observable phenomena (e.g., responses to items in an IQ-test) to theoretical attributes (e.g., intelligence)**"**

Denny Borsboom (University of Amsterdam)[1]

List of Appendixes

Appendix I. Translation and back translation of LMUP questionnaire
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Chapter 1. Introduction

Unintended pregnancy has received a remarkable amount of attention from public health professionals and social scientists. Public health professionals use unintended pregnancy as a proxy for understanding population fertility, family planning (FP), and to measure the unmet need for contraception [2, 3]. Also, the reduction of unplanned pregnancy has become a key objective for many developed countries, such as the United States (US) by the US. Health and Human Services [3, 4] and the United Kingdom (UK) by the "Government's Sexual Health Strategy objective" [5] and global health organizations such as the United Nations Population Fund (UNFPA), which supports family planning interventions that aim to ensure that every pregnancy is wanted [6]. Moreover, social scientists have become more interested in studying unintended pregnancy as it has been linked to woman's autonomy (her ability to decide to have a baby or not and the perfect time for her) and to couples' failure regarding contraceptive use, which might be because of unmet need for family planning, incorrect use of contraception, or absence of woman's agency in practicing her reproductive rights[2]. Measuring unintended pregnancy must be conducted by a tool validated to insure data quality to identify relationships and enable accurate interpretation.

1.1 Background of the Problem

Unintended pregnancy, also referred to as mistimed, unplanned, or unwanted pregnancy, was found to be difficult to measure [7]. Unintended pregnancy might occur for socially disadvantaged women for several reasons which might include: the incorrect use of contraception, the use of unreliable contraception methods, personal factors, such as ambivalence

in deciding whether to have a new child or not, health-related reasons, contraceptive side effects, lack of awareness and knowledge, cultural factors, or partner rejection [8, 9].

Unwanted pregnancies are speculated to have undesired consequences on maternal and fetal health. For example, unwanted pregnancies have been found to be strongly associated with high maternal mortality when a mother terminates a pregnancy via unsafe abortion or because of pregnancy complications [10]. Also, unwanted pregnancies have been linked to women receiving late antenatal care (ANC) follow-up [11], which potentially risks both fetal and maternal health in ways that could otherwise have been prevented if pregnancy-associated complications had been detected early. Furthermore, children who are the result of unwanted pregnancies can experience negative outcomes later in life [12]. For example, the maternal consequences of an unintended pregnancy can limit the mother's educational opportunities and stagger household finances, both of which could impact the income status of the whole family in the short and long term [13-15].

1.2 Statement of the Problem

Unintended pregnancy has been linked to negative maternal and child outcomes. Different tools were used to measure unintended pregnancy in the existing literature. Most were not validated, assuming pregnancy planning is a self-evident event [16], some used a single question format, which is not reliable to measure unplanned/unintended pregnancy [11, 16]. Unintended pregnancy should be measured through a valid tool to have scientific and clinical relevance. Barrett et al. investigated this in 2004, which led to the development of a validated tool that addresses the complexity of pregnancy planning on a 6-item scale [16]. This measure, known as

the London Measure of Unplanned Pregnancy (LMUP), has been adopted in multiple international settings [17].

Putting this in an Arabic context, such as in the Middle East and North Africa (MENA) is challenging, for the fact that it is not only a region of developing countries, also it has varying level of fertility rates; ranging from 1.9 children per woman in Lebanon in 2004, to 6.2 in Yemen at 2003. Also, they have a high level of unintended pregnancies [2]. Family planning is permissible in MENA countries, where Islam is the dominant religion. These countries do not actively limit family planning information and services [18]. Data from *Pan Arab Population and Family Health* from six countries PAPFAM (Algeria, Lebanon, Morocco, Palestine, Syria, and Yemen) indicates that there were 1.2 million unintended births based on data from the Demographic and Health Survey (DHS) survey [2]. Moreover, unintended pregnancy has recently been studied in Saudi Arabia, estimating that 53% of a convenience sample of postpartum women had unintended pregnancies. This estimate defined unintended as mistimed and unplanned pregnancy [14], but no clarification about the used tool to assess unintended pregnancy. Yet, there is no standard method available in Arabic that can estimate the level of unintended pregnancies for Arabic-speaking women or study its related outcomes. As 476 million people speak Arabic world-wide, according to Ulrich Ammon from the University of Dusseldorf, this issue needs to be overcome.

1.3 Statement of Purpose

Therefore, this study aims to develop an Arabic version of the LMUP and test its psychometric properties in Arabic-speaking women.

1.4 Significance Statement

This study is intended to facilitate future research for those who are interested in studying pregnancy planning and intention in Arabic speaking nations. There is a huge need for valid data that can guide policy that would lead to a decrease in maternal and fetal mortality.

1.5 Terms and Definitions

Unintended pregnancy was interpreted differently in the seminal literature [4]. Attitudinal measures (intended, wanted, and timing) were used interchangeably with women's behavioral measures (trying to get pregnant or not). Using attitude measures, namely "unintended" and "unwanted", may not be interpreted as opposite to "intended" and "wanted" from a woman's perspective. A woman may regard an unwanted pregnancy as mistimed and not as opposite to wanted. Understanding planned pregnancy as a measure that could be a combination of attitudinal and behavioral factors adds another dimension to the pregnancy intention measurement [4]. In some circumstances, unplanned pregnancy was referred to as 'unintended', 'mistimed', or 'unwanted' [16, 19]. While some research studies used the words interchangeably [4], others used conservative words and avoided *unwanted* as it was seen to be harsh from a woman's perspective to be used in reference to her baby [16]. In the PAPFAM project, wanting a pregnancy was measured as '*wanted* a child then', '*wanted* later', and '*wanted* no more'. They also considered that 'every pregnancy should be intended and wanted [2]. But women themselves did not use any of these words deliberately , instead they used terms like "accident"[16, 20] or "mistake"[16]. There were volunteer answers, such as "had not wanted to become pregnant but was not trying to avoid it either'' and ''had not wanted to become pregnant but was happy when it happened'' [4]. The latter comment volunteered by women themselves

shows the happiness and acceptance of pregnancy, where an unwanted pregnancy can still be seen as a positive outcome [21, 22].

In summary, regarding mistimed pregnancy as unintended could potentially lead to interpretation and measurement errors. Measuring planning status for pregnancy as a behavioral measure would be more appropriate to inform reproductive health planning programs and policy maker [4].

Chapter 2. Literature Review

2.1 Introduction

The previous literature linked between unplanned/unintended pregnancy and maternal and fetal negative outcomes. The observed links from the literature utilized multiple tools to estimate unintended/unplanned pregnancy. These tools were not standardized nor validated. Moreover, they did not account for the complexity estimating such events. Later, a valid tool was developed in UK and subsequent translation and validations was conducted in many parts of the world. This study aims to validate this tool into Arabic, which can be used in the future demographic surveillance.

2.2 Maternal Negative Outcomes and Economic Cost of Unintended Pregnancy

Unintended pregnancy has been found to be associated with multiple adverse maternal outcomes [Figure1]. A systematic review and meta-analysis of longitudinal and cross-sectional studies evaluating the association between unintended pregnancy and perinatal depression, the authors found a 2-fold increase in maternal depression in both antepartum (Odds Ratio [OR]= 2.24, 95%CI 1.88–2.68) and postpartum women (OR= 2.49,95%CI 1.50–4.13). They found no

difference in maternal depression whether the pregnancy was unwanted (OR= 2.01, 95% CI1.33–3.04) or mistimed (OR=1.92, 95% CI 1.41–2.61). Though there was difficulty pooling data from different tool measures for pregnancy intention, they found a consistent inverse association between pregnancy intention and maternal depression [23]. Similarly, women with unintended pregnancy were found to have a greater risk of postpartum depression in another study (Adjusted Odd Ratio [AOR] =1.34, 95%CI 1.08–1.68) for mistimed; (AOR= 1.98, 95%CI 1.48–2.64) for unwanted pregnancy. Preparation for pregnancy was also seen to be compromised, including less prenatal and postpartum smoking cessation, less folic acid use, late presentation for prenatal care, and less likelihood to breastfeed for >8 weeks. [11]. A high association was found between unintended pregnancy and disadvantaged prenatal care when Demographic and Health Survey (DHS) data from five developing countries (Bolivia, Egypt, Kenya, Peru, and Philippine) were analyzed. Women with unwanted vs. mistimed & wanted pregnancy had the highest likelihood of receiving late (6 months or later) or no antenatal care follow-ups (p value <0.0001), and to have an unsupervised delivery (p value < 0.0001) in all examined countries [12].

Additionally, many studies speculated the need for abortion as a marker of unintended pregnancy. The majority of abortions in developing countries were found to be unsafe. More than 60% of pregnancies in the world occur because of contraceptive non-use or contraceptive failure. Using contraception can reduce the economic and health burden i.e. the need for abortion and its associated risks of mortality and morbidity [11]. Hospitalization costs of safe abortion and the risks from unsafe abortion can be prevented with proper family planning (FP) service

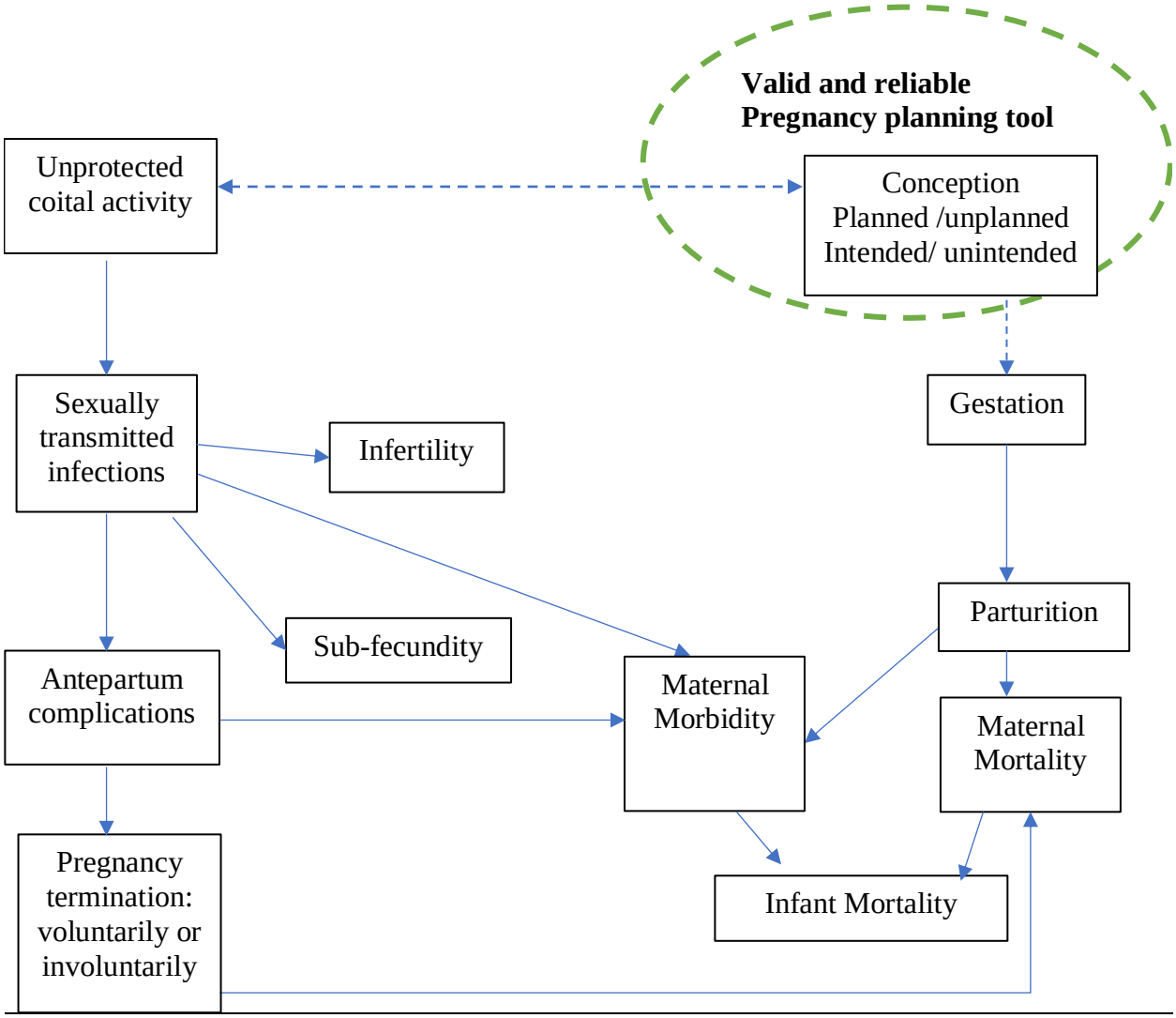

Figure 1. Pathways* for the impact of unplanned pregnancy on maternal and newborn outcomes **[11] → established correlations from previous literature by previous survey tools. ---The need for validation of the pregnancy planning measure to establish the relationships.*

that meet contraceptive needs of women at risk[11]. Achieving unmet needs with FP would reduce maternal death by up to 19%, equaling 150,000 maternal deaths annually [11]. Abortion, childbirth, or pregnancy result in as many as 30 disabled or injured women for every maternal death occurrence [10]. Globally, FP, in comparison to public health intervention, has been found to be the highest cost-effective tool that prevents unintended pregnancy and sexually transmitted infection like HIV. For every dollar paid in long-acting reversible contraception (intrauterine

contraceptive device & implants), seven are saved in unintended pregnancy [11], which can reduce the economic burden both at the individual level and nationwide. It is seen that household wealth is significantly associated with unsupervised delivery according to intention status; in the poorest households, the odds were increase six times (95% CI4.06, 9.32) in comparison to the richest ones [12]. In conclusion, the need and the positive outcomes of family planning are well established. However, investigating unintended pregnancy by a validated tool as a distinct life event/status and the circumstances around it would result in different latent attributes. And, that might help understanding how efficiently can reproductive health program can be.

2.3 Infant negative outcomes

The evidence around negative neonatal or infant outcomes in relation to unplanned pregnancy is stronger and non-questionable in relation to the lack of appropriate birth spacing (< 30 months) [11]. There is conflicting evidence whether unintended pregnancy has a direct negative fetal outcome [24]. Lack of appropriate birth spacing was investigated in Latin America using DHS data from 17 developing countries. The risk of 1) preterm birth (<37 weeks of gestation), 2) small for gestational age (i.e. baby weight is less than 10^{th} percentile for gender and gestational age), and 3) low birth weight (< 2.5 kg) was higher in infants born with less than 6 months birth interval in comparison to 18 month to 2 year intervals [11]. Furthermore, the adjusted odds of neonatal mortality rates, infant mortality, and under five mortality after an 18 month to 2 year birth interval was significantly higher in comparison to 3 to 4 year birth intervals (AORs 1.67, 1.85, and 1.91, respectively) [11]. In contrast, in a national longitudinal data survey of youth, there was limited correlation between unwanted pregnancy, birthweight and child cognitive abilities [24] after adjustment for family background. Women would report unwanted pregnancy

for higher child order (i.e. higher parity e.g. third or more) [12]. An analysis of DHS data estimated that the odds of the third child to not be fully vaccinated was significantly higher (AOR 1.6 (95% CI 1.12, 2.28)) in Kenya (AOR 1.24, 95% CI 1.09, 1.41) and in Peru in comparison to the first or second child. In this study, they discussed that developmental and health status of the unwanted child was correlated with family size rather than the birth order of the unwanted child [12]. No significant negative neonatal outcomes, i.e. low birthweight < 2.5 kg, macrosomia > 4 kg, neonatal intensive care admission, congenital defects, Brachial plexus injury, hyperlipidemia, neonatal death, or other complications were seen in relation to unplanned pregnancy in Belgium, where these mothers had a median LMUP score for the aforementioned birth-outcomes is 11 (Inter-Quartile Range [IQR] 2), which reflect planned pregnancy [9]. Considering that research about pregnancy intention and its related fetal outcomes in developing countries is scarce, more investigation has to be conducted to measure these relationships [11].

Abstract2.4 Correlates and Risk Factors of Unintended Pregnancy

Young age group, first sexual intercourse before age 16 years, current smoking, not cohabitating/ with no partner, and lower educational attainment was found to be associated with unintended pregnancy[5], [25]. The contradicting finding was found in a recently published longitudinal cohort study with a multi-method data collection approach, observing 3,795 Australian women ranging in age from 18-23 years. Researchers found that women who report ‘accidental' unintended pregnancy were found to be at the age of 21.2 $\pm$ 1.7 years, in a cohabitating relationship, or were engaged or married. Similar to the earlier study, they found that unintended pregnancy was significantly associated with early age of sex initiation (mean 15.5 $\pm$1.6 years, *p*-value <0.001) [20]. However, they acknowledged that these data lacks accuracy, where the pregnancy intention was measured by asking the following simple one-dimensional question.

"Have you ever become pregnant by accident?" This did not address the complexity of unintended pregnancy and its susceptibility to recall bias as women tend to change their intention status after delivery [20]. Analysis of DHS data from the Middle East and North Africa also found that higher parity (number of ever-born children) was associated with unplanned pregnancy. Woman who had four or more children tend to report unwanted pregnancy more than women with a lower number of children. And as women attain higher level of education, they tend to be at lower risk of unintended pregnancy [2]. These associations were drawn from non-validated tools. Although the DHS had standardized English and French versions, it was not standardized in local languages, which can influence participants' understanding of the questions [26].

2.5 Pregnancy Planning/Intention Tools

Maternal and fetal outcomes were linked to unintended/unwanted pregnancy using different tools to characterize maternal pregnancy intentions. Previous surveys used to estimate pregnancy intention/ wanted-ness are summarized in Table 1. These important national and international surveys have some limitations. Some of the limitations discussed by Barrettes et al. 2005, include that the use of a single question that uses the terms "intention", "planning", or "wanted" terms is generally unreliable [27]. The interpretation of intention by researchers might not be the same as it is in the reality. As seen in National Survey of Family Growth (NSFG), intended pregnancies were estimated as a sum of pregnancies interpreted as wanted (i.e. respondent answered "right time, later, or didn't care" on question 5 [See Table 1] and answered "Yes" to question 3). On the other hand, unintended pregnancy was estimated as a sum of the unwanted and mistimed pregnancies. The analysis of NSFG by this method introduces indistinct and misrepresenting intention interpretation to the readers and to the body of the literature as

Table 1. Pregnancy intention tools

Year	Question	Categories	Interpretation
National survey of family growth (NSFG) [3]			
1973-2016	1- Before you became pregnant . . . had you stopped using all methods of birth control?	**1-** Yes, No (If Yes, go to 2; If No, if no go to 3)	
	2- Was the reason you had stopped using any methods because you yourself wanted to become pregnant?	2- Yes, No, I don't know (If yes, go to 5; If No, go to 6; If I don't know, go to 4)	
	3- At the time you became pregnant . . . did you yourself actually want to have a(nother) baby at some time?	3- Yes, No	3-Yes= Wanted No= Unwanted
	4- It is sometimes difficult to recall these things, but just before that pregnancy began, would you say you probably wanted a(nother) baby at some time or probably not?	4- Probably yes, Probably no, Didn't care (If probably yes, go to5; if probably no or didn't care, go to 6)	4- Probably no = Unwanted
	5- Did you become pregnant sooner than you wanted, later than you wanted, or at about the right time?	5- Sooner, Later, Right time, or Didn't care	5- Sooner= Mistimed -Right time, later, didn't care= Wanted
1995-2016	6- Happiness measurement: asked the respondent who happy show was when she know she was pregnant	6- A 10-point scale ranging from very happy to very unhappy	
	7- Ambivalent measurement: asked the respondent about her feelings around here pregnancy: e.g.	7- A 10-point scale ranging from strongly agree to strongly disagree e.g. Strongly agree	7- Maximum ambivalence
Demographic and health survey (DHS) [10] in more than 90 countries			
1948-2016	"At the time, you became pregnant with [name of last-born child], did you want to become pregnant then, did you want to wait until later, or did you want no more children at all?"	"I wanted to get pregnant then"	Intended
		"I wanted to get pregnant later"	Mistimed
		"I did not want any more children"	Unwanted

Continue: Table 1. Pregnancy intention tools.

Year	Question	Categories	Interpretation
Pregnancy Risk Monitoring Assessment System (PRAMS) by CDC [10]			
1987-2016	"Thinking back to just before you got pregnant, how did you feel about getting pregnant?''	''I didn't want to be pregnant then or at any time in the future, or I wanted to be pregnant later.''	Unintended
		''I wanted to be pregnant, sooner, or I wanted to be pregnant then''	Intended
Cross-sectional survey data from Indonesia [10]			
1996	"Ever experience unintended pregnancy"	"Subjective (respondent report)"	Ever vs. never had unintended pregnancy
Contraceptive Use, Pregnancy Intention and Decisions (CUPID) [17]			
2011-2014	"Have you ever become pregnant by accident?"	Yes	Unintended

*for clear up-to-date reference with specific modifications, see survey websites, as this information is beyond this study's purpose.

discussed by Klerman, 2000 [4] because the intention was correlated to maternal and fetal outcomes and their interpretations might be incorrect.

2.6 London Measure of Unplanned Pregnancy (LMUP) construction and implementation

In the year 2002, Barrett conducted an in-depth investigation on women's understanding of "planned, mistimed, unwanted" pregnancy and circumstances around pregnancy planning and what factors would be associated with pregnancy planning. There were two rounds of in-depth, qualitative interviews with 47 women who either kept their pregnancy or opted for termination. Barrett found that four criteria applied to the term "planned" pregnancy: clear intention for pregnancy, intentionally not using a method of contraception, having a partner agreement, and pregnancy preparation by choosing the right time and/or broader life preparation in general There was no consensus in the terms used by the women in understanding the words of intended, wanted, and planned vs. unintended, unwanted, unplanned; Most might say 'accident/mistake'

[16]. Two years later, Barrett developed a measure for unplanned pregnancy in a mixed method study. She depended on the qualitative phase results, which were a flexible, normal conversation model to capture the circumstances surrounding when women get pregnant. After gathering the essential elements from the women's experiences, she did a second interview for the participants after delivery as some data suggests women tend to change the status of pregnancy intention after delivery. Then, the items were tested in a pilot phase in an interview module to capture women's understanding. Next were the two psychometric quantitative field tests, item analysis, and selection. At the first round, the measure contained 11 items, which were trimmed off in the second round by removing items which had a total-item correlation of less than 0.2 in the exploratory factor analysis. The final tool consisted of the following six items: contraceptive use, timing, intention, desire for motherhood, partner influence, and preparation for pregnancy. Acceptability was tested and found that it was acceptable for all women regardless of the pregnancy outcome, which means it might be used in any setting including national or international surveys [28]. Furthermore, this tool was validated for English and Spanish-speaking women in the United States [29], Kannada and Tamil-speaking women in India [30], Chichewa-speaking women in Malawi [31], Persian-speaking women in Iran [32], and Portuguese-speaking women in Brazil [17]. These validated versions of the LMUP measure pregnancy planning in their specific setting. As we will demonstrate, the complexity of measuring planning pregnancy is different in each context, which might have different maternal and fetal outcomes.

2.7 Items of LMUP

2.7.1 Contraceptive use: Studies have shown that in order to plan for a pregnancy women would deliberately stop using contraception in alignment with other preparatory actions [16].

This was illustrated in the Australian longitudinal cohort survey *Contraceptive Use, Pregnancy Intention, and Decisions* (CUPID) found that 73% of women who reported unintended pregnancy were using a contraceptive method at the time of conception with the majority of them using one form of contraception (70%) and 28.6% who were using oral contraceptive pills (combined or progestogen only) [20].

2.7.2 Timing: A wider context for pregnancy planning may include the correct timing for a pregnancy. While the correct timing may not mean an exact month rather than the preparation during a specified period [16]. An analysis conducted on DHS data of 30 African countries from 2006-2015 found a wide discrepancy on unwanted pregnancy and mistimed pregnancies ranging from (<1%-40%) and (7%-41%), respectively. They attributed the discrepancy to two factors, mistranslation and the subject complexity. The English version was standardized across all countries, but there were many local languages for which they did not standardize the translations. Secondly, intention for a pregnancy has a complex socially imbedded dimensions [26].

2.7.3 Desire for motherhood: Some women who reported unplanned pregnancy might have some desire for motherhood [16]. Desire for motherhood seems to be unclear when it is measured at a different time during pregnancy. Researchers investigating the 2006-2010 NSFG observed that the mid-pregnancy feelings toward pregnancy seem to be resolved at the end of the pregnancy toward wantedness. This change in the level of desire is significantly associated with women's age (20-31 year), being in a relationship at time of conception, high level of education, women income, having high religiosity, and race/ethnicity (Hispanic) [33].

2.7.4 Intention: The pregnancy intention was described by women in many ways. Some interpreted it as synonymous to planned and/or deliberate cessation of birth control methods;

others described it with intense planning behaviors and choosing the right time for conception [16].

2.7.5 Partner influence: Women used the term planned to describe a pregnancy when there was a discussion and consensus between couples to have a baby, or when they had prospective agreement of having a baby in women's or couple's life [16].

Communication with a partner and his approval was found to play a role in the use of family planning methods. In addition, many social factors, such as relationship power dynamic, patriarchal gender role, desire for a specific gender, pressure form extended family or partner influence, can limit women's ability to exercise their reproductive rights and be at risk of unplanned pregnancy [34]. Being in a relationship with an extreme level of partner influence as seen in relationships with intimate partner violence (IPV) has been determined to be a risk factor for unintended pregnancy [35].

2.7.6 Preparation before pregnancy: In a cross-sectional study, conducted in the UK to investigate how women plan and prepare for pregnancy, it was found that women with planned pregnancies are more likely to change their behaviors i.e. reduce smoking (68%), reduce alcohol intake (49%), and to have a dietary modification (38%). Although there was limited knowledge of the importance of folic acid supplements intake during pregnancy among participants, women with planned pregnancies were the group with the highest intake of supplements like folic acid (31%) or folic acid with a multivitamin (32%). On the other hand, women with unplanned pregnancies or who were ambivalent were found to have less positive behavior changes, with 94% of women who had unplanned pregnancy and 84% of those who were ambivalent not taking folic acid [36].

Interaction between items:

These factors associated with unintended/unplanned pregnancy influence each other. As seen in different studies, partner reproductive coercion affects consistent, correct use of contraception [37]. Additionally, desire for motherhood/intention decision from women's perspective captured the essence of pregnancy status, regardless of contraceptive behaviors [16]. Also, positive child outcomes were found to not be significantly different between mistimed and wanted pregnancy [12], which raised the question of whether or not more effort has to be put towards understanding the directionality in the hypothesis regarding negative birth outcomes to unplanned pregnancy. So, we aim in our study to validate a tool that can be used with confidence to measure unplanned pregnancy in order to measure maternal and child outcomes.

Table 2. Comparison of the validation results of the original London Measure of Unplanned Pregnancy (LMUP) and its validated versions

	Internal consistency: Cronbach's alpha	Test- retest: Weighted Kappa	Construct validity: Principal Component Analysis (Eigenvalues)
UK – English	0.92	0.97	4.33
USA – English	0.78	0.72	2.9
USA – Spanish	0.84	0.77	3.4
India – Kannada	0.76	0.43	2.66 and 1.05
India – Tamil	0.71	-	-
Malawi – Chichewa	0.78	0.80	3.1 and 1
Iran – Persian	0.87	-	-
Brazil – Portuguese	0.81	-	3.12

Adopted from [17]

2.8 Unplanned pregnancy in Saudi Arabia

Unintended pregnancy has recently been studied in Saudi Arabia, estimated that 53% of a convenience sample of postpartum women had unintended pregnancies. This estimate defined unintended as mistimed and unplanned pregnancy, without further clarification of the tool was used for this estimate [14]. Contraception as a family planning cornerstone is considered not only as a tool that contributes to when and how to plan for a pregnancy [8], it is a tool to ensure birth-spacing that contributes to healthy pregnancy, and reduces negative maternal and infant outcomes [38]. In recent years, sociodemographic trends have changed with Saudi women attaining higher levels of education and increased accessibility to work labor, which have resulted in a change in women's beliefs on childbearing and behaviors observed, evident by lower fertility rates and inclination towards child spacing [39, 40]. Considering Saudi females as our target population, the crude maternal mortality rate (MMR) is 2.3 cases per 1000/persons in 2016, and post-neonatal mortality rate for children aged 29 days to 1 year is 4.82/1000 live born infants[41]. Although these rates are considered acceptable in comparison to the global trends for IMR and MMR (216/ 1000 person) [42] and (32/1000 live born) respectively [43]. Moreover, the country prevalence of contraceptive use by childbearing age (15-40-year-old) in married Saudi women is 28.2% [41], which is low in comparison to the global trend of contraceptive use in most world regions (64% in 2015) [44].Although KSA has very low contraceptive use rates (less than 30% usage by ever-married Saudi women of childbearing age), the country has a low fertility rate (2.4 children per woman) [41]. Given the illegality of abortion unless to protect physical or mental health [45] and existing barriers in accessing emergency contraception [40], effective family planning services have to be in place to enhance planned pregnancy, which would prevent negative maternal and child health outcomes[11]. Therefore, a reliable

measurement of unplanned pregnancy in Saudi Arabia with a validated tool would provide a means to monitor family planning success. The purpose of this study is to establish a valid and reliable measurement tool.

Chapter 3. A- Methodology

3.1 Introduction

Up to this point, none of the earlier versions of demographic surveys (e.g. DHS) that collect information about pregnancy intention/planning, have validated or standardized an Arabic version of their survey. And, even such surveys have already been deployed in many Arab countries [46]. Given that, there are 476 million Arabic-speaking people around the world, yet no validated measuring tool for demographic surveying, this presents a potential gap in the data collection[47]. Thus, the purpose of this study is to validate an Arabic-translated version of the LMUP and psychometrically validate in order to ensure accurate measurement of unplanned pregnancy in Arabic-speaking settings. These more accurate measurements of unplanned pregnancies in Saudi Arabia will be provided for use in family planning services.

3.2 Population and sample

Arabic-speaking Saudi women who were ever pregnant and of childbearing age (15—49 years) were the target population of this study. A self-administered online survey of the Arabic pretested version of LMUP was conducted. Social media platforms (e.g. WhatsApp) were used to recruit study participants using a non-probability sampling design.

The sample size calculation for psychometric studies is not a frequently applied practice, but is recommended [48]. Therefore, this study conducted sample size calculation and estimated that 383 responses would be an appropriate sample size for this study. The assumptions for sample

size calculation included a 53.5% prevalence of unplanned pregnancy in Saudi Arabia [14], a confidence level of 95%, a design effect of 1, and a 2016 population estimate of 5,950,182 ever-married Saudi women of childbearing age (15—49 years old) [41].

A total of 962 women responded to the survey within a period of 11 days. Of this total, Twelve responses were removed for women who never had a pregnancy and who were not currently pregnant, because the LMUP is designed for retrospective measurement of pregnancy planning status [49]. For the test-retest assessment, women were recontacted after a period of 7 days and asked to retake the survey. A total of 24 women did the retest. A participants' flowchart is presented in Figure 2.

3.3 Research design

A cross-sectional study was conducted among 796 ever-married Saudi women of childbearing age (15—49 years old), who have been pregnant at least once.

The study was approved by Emory University's Institutional Review Board (IRB) following an expedited review (IRB approval number IRB00093915). All participants consented to study participation.

3.4 Instrument

The London Measure of Unplanned Pregnancy (LMUP) was designed in 2002 [5], then validated to be used in the United Kingdom in 2004 [6]. Then, it was translated and validated to be used in multiple countries using the native language of those countries including the United States, Malawi, Iran, India, and Brazil [7-11] [Table 2.]. The scale's simplicity, and its substantial world-wide usage, means that it produces consistent results in the measurement of unplanned pregnancies, and implies its appropriateness as a reliable method in assessing unplanned

pregnancies. The scale measures the circumstances around a woman's most recent pregnancy in regards to contraceptive use, timing, intention, and desire to have a baby, discussion with the partner, and preconception preparation. The questionnaire is preceded by sociodemographic questions for hypothesis testing, to measure respondent diversity and its representation of the desired population. It includes age, level of education (i.e. primary school, intermediate school, secondary school, diploma, bachelor, and post-graduate), area of residence (i.e. urban or rural), region in Saudi Arabia, number of pregnancies, number of children, whether the respondent is currently pregnant or not (gestational age if pregnant), whether currently lactating (postpartum) or not and age of the last child.

The analysis of the LMUP score ranges from 0-12, with a total of 6 questions, and each question (item) categories are scored 0,1, 2. The higher the score, the higher the pregnancy planning and intention. By avoiding dichotomous answers in the scoring of this measure, such as "planned" and "unplanned", the measurement of ambivalence in pregnancy intention is possible. This has been found to be helpful for understanding its associated sociodemographic correlates[13, 33]. Therefore, with the full range of the score displayed, additional information about each individual score is presented. According to Barrett [50], a score cut-point of less than 3 indicates unplanned pregnancy, more than 10 indicates planned pregnancy, and scores in between indicate ambivalence of planning pregnancy[16].

3.5 Procedures

The LMUP tool was translated into Arabic by the principal investigator (PI) who is fluent in English and Arabic. Then, an online questionnaire was prepared by the PI for piloting. The

questionnaires –Arabic and English— are found in Appendix I. They are preceded by a consent form that describes the study purpose, target population, age group, and a complete review of participants' rights. To obtain the consent of participants, women were required to select "agree" in order to be eligible to participate in the study.

The questionnaire included two sections. The first consisted of sociodemographic questions which were included for hypothesis testing, and to measure the sample representation in comparison with the national demographic data. The second section contained the 6 items of LMUP (contraceptive use, timing, intention, and desire to have a baby, discussion with the partner, and preconception preparation).

The Arabic version of the LMUP was then piloted among five Saudi women who were eligible for study participation; they were contacted by phone to ensure accurate wording of questionnaire and its acceptance. Following the pilot, to further review the survey for content, a field epidemiologist from the Hubert Department of Global Health at Emory was recruited to provide additional feedback. This epidemiologist had worked extensively in Arab settings and has familiarity with Arab culture.

The tool was modified based on recommended changes and was back-translated to English by an official translation services office in Saudi Arabia and we ensured that the back translation had consistent structure and content with the original version of LMUP. A few changes were made according to the results of the pretest. First, we altered the choice categories on pregnancy preparation item of the Arabic LMUP by removing "alcohol" and adding "partner smoking outside

of the house" as a culturally acceptable measure for pregnancy preparation. Second, instructions for each question were summed up in the beginning of the tool then changed for the last question to choose all that apply. Furthermore, we evaluated whether the use of "partner" as it appeared in the original LMUP was understandable as "husband". This was confirmed, and accordingly no changes were made to the term. The last change was the introduction of the Arabic word "أُرْزَقْ" / 'blessed' in the desire item of LMUP that asks about desire to have a baby, as this is the term that is used in Arabic for the word "having a baby". The LMUP back translation was consistent with the original English version.

Then, the Arabic survey was disseminated electronically via social media platforms (Facebook, Twitter, and WhatsApp©) to obtain a psychometric evaluation of the LMUP for Arabic speaking women. Electronic surveys were chosen for faster, long-distance, and anonymous data

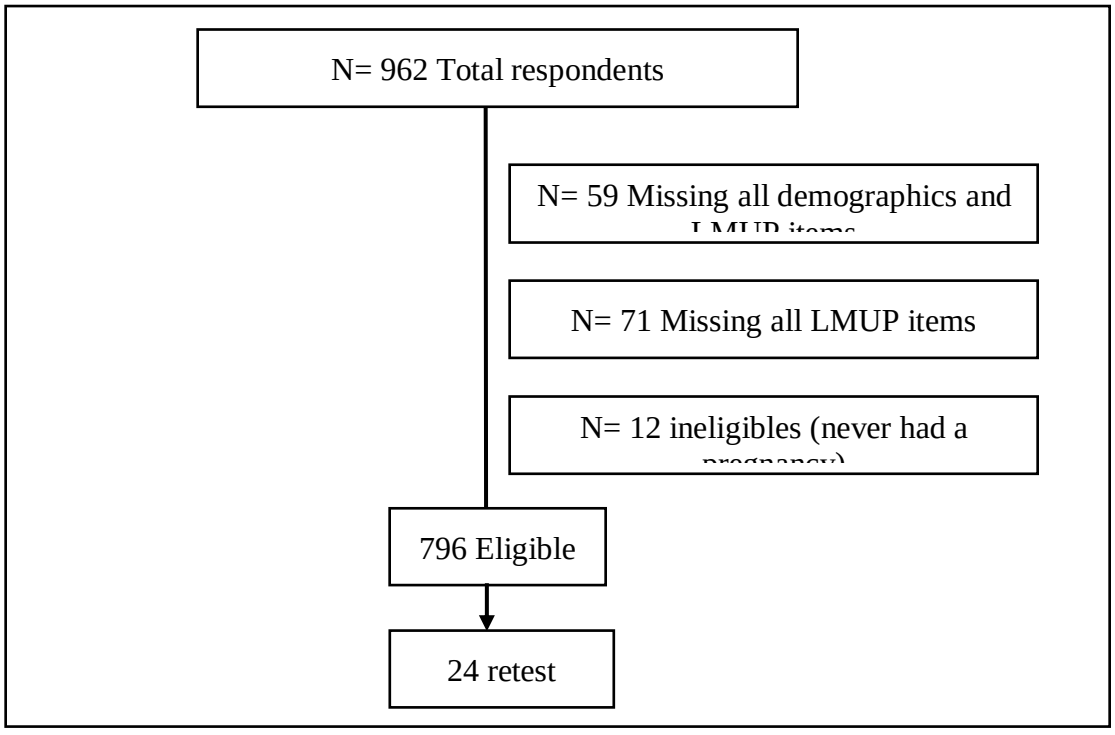

Figure 2. Participant flow chart

collection. Data was collected between February 11—22, 2017.

To assess content validity, another online questionnaire found in the Appendix III. was developed for specialists in family planning to rate the LMUP questions according to relevance in the Arabic context. The rating was structured on a four-point Likert scale (totally relevant, relevant, slightly relevant, not relevant).

3.6 Validity assessment and statistical analysis

Patient reported outcome (PRO) tools have to be psychometrically validated in order to be usable in clinical research [48]. The analysis of the psychometric properties of the Arabic LMUP was done through content, structural, substantive, as well as the generalizability aspects of validity [51].

A. Content validity: is "the ability of an instrument to reflect the domain of interest and the conceptual definition of the construct" [48]. The scale content relevance and representation to the pregnancy planning is determined by face validity, and technical quality of the items and their relationship to the content validity. Evidence of face validity and technical quality of the items determine content validity. Face validity achieves the acceptability of the tool in the context of a woman's country [48]. We established face validity by pilot-testing the Arabic version of the LMUP in a group of five Saudi women and modifying the wording of the instrument according to the results of the pilot. The technical quality of the tool was established by using experts' judgment. We asked multiple Saudi family planning (FP) experts from the department of the Obstetrics and Gynecology to rate the LMUP items according to the item relevance, using social media platforms to reach out for specialists' names, specialty and their hospital affiliation. Twelve specialists gave their items rating, two were excluded (one was from general surgery and

not a FP expert, and the other one provided ratings but commented that he/she did not understand the required task). These experts' rating provided feedback regarding suitability and the compatibility of the items in the validated measure[52].

We measured the content validity index for individual items (I-CVI) and for the whole scale (S-CVI). For I-CVI, the Likert scale was scored as 4= totally relevant, 3= relevant, 2= slightly relevant, 1= not relevant. Then, the score was dichotomized (3 or 4= relevant; 1 and 2= not relevant). I-CVI was calculated by computing the number of expert-rated relevance divided by the total number of raters. Ideally I-CVI should not be less than 0.78 if there are 6 or more raters [53]. The S-CVI was calculated using the averaging method, where the average I-CVI was divided by the number of raters, as it reflects more on the averaging of the quality of item agreement rather than average rater's performance. S-CVI should have a value of 0.8 at minimum. Also, the range (maximum-minimum) for I-CVI gave accurate assessment about the overall agreement of each individual item included in the validated tool [53].

B. Structural validity: judges the scoring coherence between scoring structure and the structure of the target domain. And this is established by collecting evidence that reflects the correlation of the tool items and the tool scores [51]. In other words, collecting evidence that measures the ability of the (LMUP) items' construct to measure planned pregnancy status as one item and to be correlated to the LMUP structure. Exploratory factor analysis (EFA) was used with the principal axis factoring (PAF) extraction method. In EFA, if items load on one factor (eigenvalue >1) this means that we are measuring one factor, which is the planning status of pregnancy (LMUP). The underlying latent structure would be explained by the extracted shared

variance. Also, the strength of individual item relatedness to the scale in factor matrix was measured. Each item in the factor matrix ranges from 0 to 1. The closer the item to 1, the stronger the relatedness to the measured scale [54]. When the score nears 0, this can mean that 1) the item is too easy to be answered or too difficult; "item endorsement" should be > 10% and < 80%, or 2) it may not measure the target construct. Additionally, item communality in the EFA established the data's strength in the factor analysis (i.e. showing unified high communalities without cross item loading among factor analysis); it also showed strong variables loading on each factor(s). Communalities are essentially item correlation, with >.8 meaning high and between .7 to > .4 reflecting moderate to low communality. If an item scored < .32, the item may not be related to the rest of items in the scale, or more factor exploration is recommended [55].

C. Substantive validity examines the ability of the tool (LMUP) score to reflect a literature evidence or theoretical framework to be in coherence with the target population attitudes [52]. This was established by hypothesis testing. Hypotheses testing is determining whether the respondent score is compatible with the literature evidence or not, regarding the planning of a pregnancy. We tested two hypotheses: 1) that highly educated women tend to plan for pregnancy [22], i.e. they have high LMUP scores; and 2) that women with higher parity tend to report their pregnancy as unwanted [28], i.e. they have low LMUP score. Kruskal-Wallis test was used to evaluate differences in median LMUP scores by education and parity.

D. Generalizability: is the ability of the scale to be generalized among different populations with variable characteristics and in different settings. Establishing generalizability by collecting evidence of contextual stability and reliability. Contextual stability is the ability of an instrument

to achieve consistent results in different time periods and/or in different settings, which are called situational and cross-sectional consistency, respectively [51]. Situational consistency tests whether answering the tool in different time would change the score results. We assessed situational consistency of the LMUP by calculating linear weighted Kappa (the non-parametric equivalent for intra-class correlation coefficient) for the test-retest reliability. In the test-retest reliability, we asked the respondents to retake the questionnaire on any day the following week after the first administration). The anonymous data linkage between first and second administration was done via deterministic data linkage, using unique identifiers, including: age, parity, level of education, residency, and region. We could not assess long-term reliability (i.e. to test if women in postpartum may change her LMUP score from unplanned to planned or to wanted pregnancy, due to time constraints). Kappa score was interpreted as follows: moderate agreement (scores 0.4 - < 0.6), substantial agreement (scores 0.6- < 0.8), and almost perfect agreement (scores 0.8-1.00) [29].

Cross-sectional consistency tested whether women in different settings, i.e. residing in urban or rural areas, would have different score distribution. We assessed cross-sectional consistency by testing the difference of the LMUP score between urban and rural settings. Mann-Whitney U (the non-parametric equivalent of t-test) tests the median change of the LMUP score, between the two-residency locations.

Finally, reliability represents the tool's ability to give a constant outcome every time. That was done by assessing Cronbach's alpha statistics, which assumes that the average correlation of the set of items was a good estimate of the scale we were trying to measure. Cronbach's alpha (> 0.7) would be acceptable. Analysis were carried out using IBM SPSS Statistics Grad Pack 24 for

Mac (SPSS Inc.: *SPSS for Mac,* Version 24).

Chapter 3. B- Results

Pilot, main sample and retest sample characteristics:

The pilot sample included 5 women, their mean age was 32.4years, from eastern province of Saudi Arabia. Where the main sample had a total of 962 responses was collected, out of which 796 with complete data were analyzed. The majority of the respondents were from the eastern province of Saudi Arabia (87%); their median age was 32 years (IQR 28,38); most of them had at least a degree level of education (65%); around 60% were not pregnant nor nursing; and the median number of children the women had at the time of the study was 2 (IQR 1,4). The distribution of the LMUP score according to the sample characteristics is shown in [Table 3].

For the retest sample, the majority resided in the eastern province (95%), two thirds had at least a degree level of education, 25% were pregnant and most of the pregnant women were in the last trimester, the median age of the last child was 3 years, and the median number of children was 2. On average, they sent the second response 5.4-days after the first response.

LMUP Score

The distribution of LMUP scores is shown in Figure 3. The median score was 8 (IQR 4,11). Twenty three percent (n=180) of the participants had unplanned pregnancy in the last or the current pregnancy (LMUP score 0-3), 36% (n=283) were in the ambivalent group (LMUP score 4-9), and 42% (n=333) had their pregnancy planned (LMUP score 10-12).

Table 3. Difference in the London Measure of Unplanned Pregnancy (LMUP) score by characteristics of the study sample of Saudi women.

	N (%)	Median (IQR)	P value
Residence			0.179/0.461*
Urban	606 (76)	8 (3,11)	
Rural	190 (24)	8 (4,11)	
Pregnant	107 (13)	9 (4,11)	
Nursing/ postpartum	214 (27)	8 (4,11)	
Not pregnant nor nursing	475 (60)	10 (6,12)	
Parity			<0.0001**
Currently pregnant with the first child 0	18 (2)	10 (6,12)	
1	186 (23)	10 (4,11)	
2	222 (28)	8 (4,11)	
3	159 (20)	6 (3,10)	
4	122 (15)	6 (2,10)	
5	47 (6)	5 (2,9)	
6 or more	37 (5)	4 (2,7.5)	
Age (years)			0.352**
20-24	66 (8)	9 (5,11)	
25-29	179 (22)	8 (4,11)	
30-34	259 (33)	9 (4,11)	
35-39	145 (18)	8 (3,11)	
40 and more	147 (18)	8 (3,10)	
Educational attainment			0.011**
Primary school	6 (1)	9.5 (4.25,10.50)	
Intermediate school	10 (1)	8 (5.75,10.25)	
Secondary school	149 (19)	7 (3,10)	
Diploma	111 (14)	7 (4,10)	
Bachelor	422 (53)	8 (4,11)	
Post graduate	99 (12)	10 (5,11)	

* Mann-Whitney p value (median/ distribution) of LMUP are the same across residency categories (urban, rural).
** Kruskal-Wallis test showed the distribution of the LMUP is not the same across education categories.

Validity Measures

A. Content validity

The scale's content appropriateness was confirmed by experts rating, 10 family planning practitioners with an average experience of 8 years (SD 9 years). The content validity index was acceptable for both individual items (I-CVI > 0.78) and the overall scale (S-CVI > 0.8). The I-CVI range (maximum-minimum) was 0.4, reflecting the low index for the partner discussion item which was rated as not relevant by 4 out of the10 raters [Table 4].

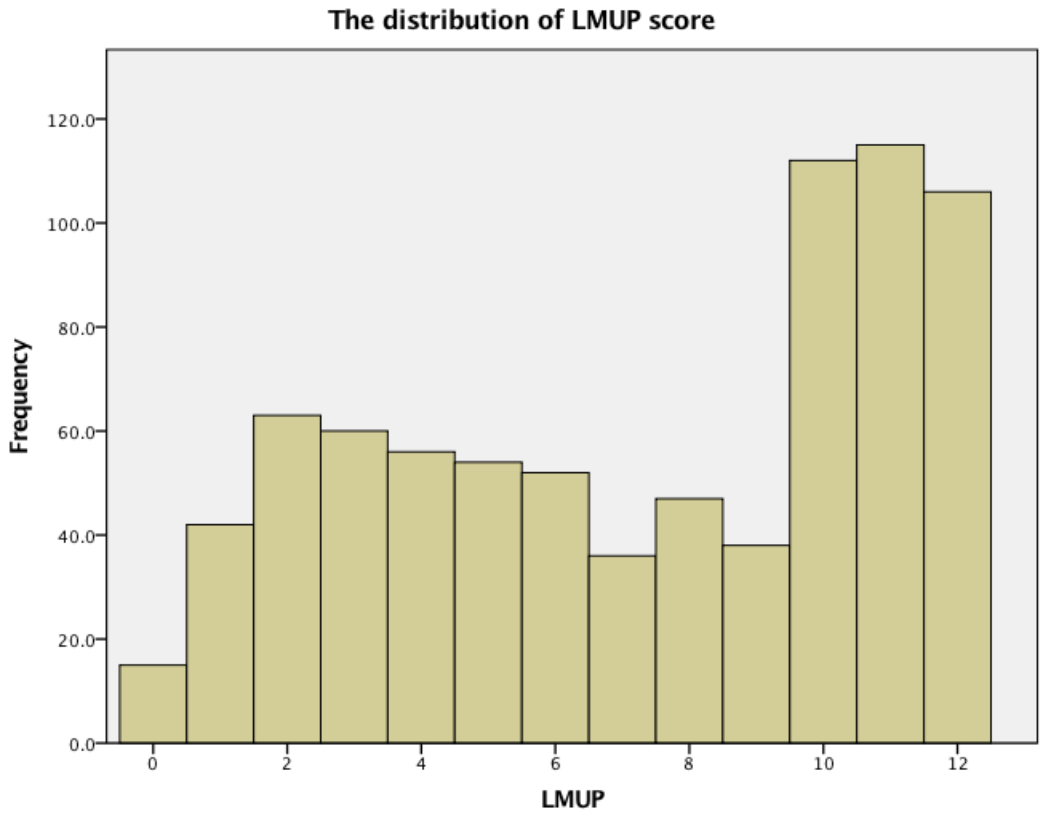

Figure 3. Distribution of the London Measure of Unplanned Pregnancy (LMUP) score for ever-married Saudi women. LMUP score*: 0 unplanned pregnancy, 12 unplanned pregnancy.*

Table 4. Expert rating of the six items in the Arabic version of London Measure of Unplanned Pregnancy (LMUP).

Experts Items/	1	2	3	4	5	6	7	8	9	10	Total agreement	Item CVI
Contraceptives	1	1	1	1	1	1	1	1	1	1	10	1.0
Timing	1	1	1	1	1	1	1	1	1	1	10	1.0
Intention	0	1	1	0	1	1	1	1	1	1	8	0.8
Desire	0	1	1	1	1	1	1	1	1	1	9	0.9
Partner	0	1	1	0	0	1	0	1	1	1	6	0.6
Preparation	1	1	1	1	1	1	0	1	1	1	9	0.9
Expert's proportion	0.5	1.00	1.00	0.67	0.83	1.00	0.67	1.00	1.00	1.00	I-CVI= S-CV/Ave=	0.87 0.87

I-CVI, item-level content validity index.
S-CVI/Ave, scale-level content validity index, averaging calculation method.

B. Structural validity

The data was suited for EFA based on tests of sampling adequacy; the Kaiser-Meyer-Olkin (KMO) test had a value of 0.885, and the Bartlett's for Sphericity was statistically significant with a p-value <0.0001. Principal axis factoring for factors extraction confirmed that we extracted only one factor with all items in the scale loaded on 3.779 eigenvalue. The total shared variance was 63% for the extracted factor. Also, the factor matrix confirmed items correlation with the measured scale, with contraception and preparation having lesser correlation [Table 5]. Furthermore, investigating item endorsement revealed that all items met the endorsement criteria, except for contraceptive which had less than 10% observation, representing women who were using contraceptive before the last pregnancy [Table 6.].

Factor communalities showed strong data, that the factor analysis demonstrated with unified loading on one factor only, and there was no cross loading among other factors. The strength of

Table 5. Reliability testing and exploratory factor analysis

Factor Matrix* -(EFA)	Factor 1	Factor Communalities	Cronbach's alpha
			.878
Contraception	.544	.296	
Timing	.804	.712	
Intention	.930	.842	
Desire	.889	.803	
Partner	.778	.686	
Preparation	.482	.331	

*Extraction Method: Principal Axis Factoring. 1 factor extracted. 6 iterations required.

Table 6. Item endorsement for London Measure of Unplanned Pregnancy (LMUP) items

Items	Categories	Frequency	Percent
Contraceptive use	0. Always using contraception	69	8.7
	1. Non-consistent use, or failed at least once	206	25.9
	2. Not using contraception	521	65.5
Timing	0. Wrong time	145	18.2
	1. Ok, but not quite the right time	240	30.2
	2. Right time	411	51.6
Intention	0. Did not intend pregnancy	262	32.9
	1. Intentions kept changing	154	19.3
	2. Intended pregnancy	380	47.7
Desire	0. Did not want baby	188	23.6
	1. Mixed feelings about having baby	204	25.6
	2. Wanted baby	404	50.8
Partner discussion	0. Never discussed having children together	194	24.4
	1. Discussed but I did not agree to get pregnant	188	23.6
	2. Discussed, and agreed to be pregnant	414	52.0
Preparation	0. Did no preparatory behaviors	426	53.5
	1. Did 1 preparatory behavior	211	26.5
	2. Did 2 or more preparatory behaviors	159	20.0
	Total	796	100.0

the data was shown as the following: intention and desire had a high correlation to other items in the scale; timing and partner had moderate communality, and contraceptive use and preparation had low communality [Table 5]. We conducted multiple factor extraction models for further factor exploration to investigate the relationship of the lesser communality items. However, all types of extraction models (analysis not shown) resulted in one factor extraction, which confirms that the scale items are measuring one factor "LMUP" i.e. unplanned pregnancy. The large sample size allowed for valid interpretation of the factors structure and inclusion of the items in the scale [55].

C. Substantive aspect of validity

Hypothesis testing was met for both hypotheses. For the first hypothesis high education attainment was associated with a higher LMUP score (bimodal relationship Table 3). For the second hypothesis, a trend for lower LMUP score with higher parity was observed [Figure 4].

D. Generalizability aspect of validity

Stability

We had substantial agreement as measured by linear weighted kappa (0.776) in the test-retest reliability. There was no significant difference in the median LMUP score between the first (median=5.5; IQR 3.25-9.75) and the second administration (median=5; IQR 4-10.75; p-value <0.0001). Cross-sectional stability for LMUP scores was established with both rural and urban areas having almost the same median score distribution and interquartile range of (Rural: median=8 IQR 3,11 for rural; and Urban: median=7 IQR 4,11, respectively; p-value= 0.461) [Table 3].

Reliability

Cronbach alpha test was above acceptable [Table 5].

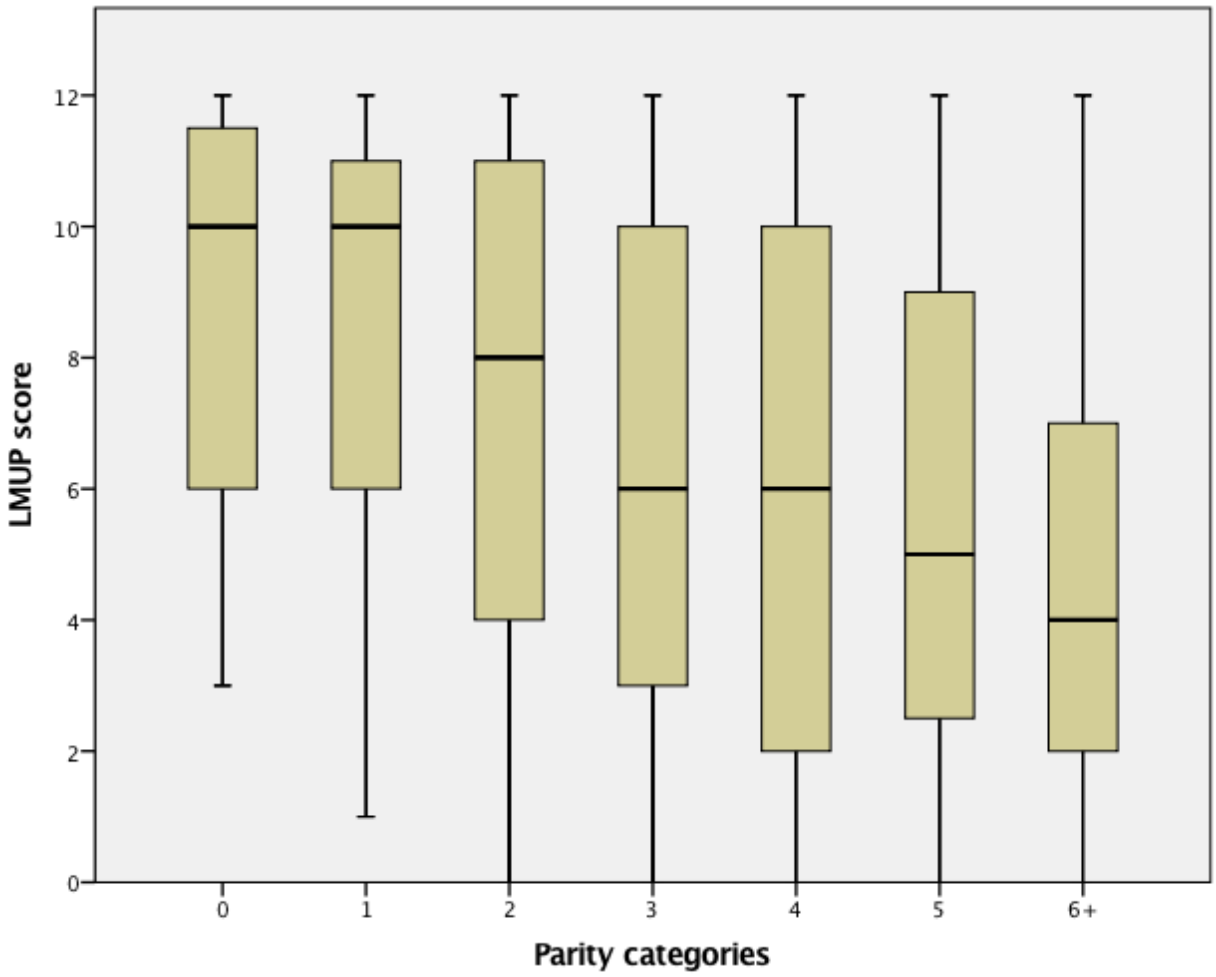

Figure 4. Distribution of London Measure of Unplanned Pregnancy (LMUP) score of Saudi women parity. *0 parity consisted of women who are had no prior born child, and/or currently pregnant with the first one.*

Chapter 4 Findings

Discussion

This study translated and validated the LMUP, a well-validated tool that can measure intention/planning for pregnancy. It captures behaviors and attitudes that have been associated

with pregnancy planning. Tools used to measure unintended pregnancy have been developed and applied mostly outside the Arabic world, where they address specific needs and desired outcomes (such as lowering the number of unintended pregnancies and unsafe abortions), aspects that may be different or inapplicable in an Arabic context. Furthermore, these tools are not sensitive to different contexts where, for example, contraception use is low and pregnancy planning is not as important in a family's reproductive goals, apart from ensuring a reasonable spacing of around 24 months between pregnancies. In a previous evaluation of DHS data from 30 countries, a wide discrepancy in unwanted and mistimed pregnancy statistics was illuminated, and part of this discrepancy was attributed to statistics not being representative of actual values and circumstances due to the use of unstandardized translated tools, which might also be inappropriate for a population whose attitudes and beliefs on pregnancy have a complex, socially-embedded dimension [26]. Therefore, while proper tools that measure pregnancy planning behaviors by a multi-item questionnaire do exist, they have not been translated to Arabic and validated, leaving a gap in the data for surveillance programs and reproductive health needs assessment necessary for policy decisions.

Arabic and Islamic cultures show gratitude and spiritual delight for a pregnancy. Birth control is considered acceptable primarily for the purpose of birth spacing so as to protect the health of the mother and alleviate the burden of frequent pregnancy on her and the rest of the family [38, 56, 57]. These feelings toward pregnancy shape women's behavior regarding birth control use, which may explain the low contraceptive use and knowledge in countries such as Saudi Arabia [22, 58-60].

The evidence of technical validity and face validity confirms the content validity of the Arabic version of LMUP. However, there were some discrepancies between the specialists' rating and the respondents' LMUP score regarding the partner discussion item in the LMUP, which might be explained by two theories. The first is that the wording of the partner discussion item was confusing in the tool. For instance, the question asks the participant in the beginning about the circumstances around the current or most recent pregnancy, but then when the participant is asked whether or not they discussed having children together with their partner, the item choice listed "we *never* discussed having children together". The second theory on this discrepancy is that couples might have discussed this and agreed on it a long time before pregnancy occurs, as observed in the UK [16]. Similarly, discussions of family size may occur at the beginning of a relationship, then subsequent discussion may follow according to the partner's health and life constraints. We suggest future wording modification for the partner item for a consistent clear measurement of partner discussion.

Factor analysis established that all LMUP items were extracted as one factor. However, we had lowered communalities for preparation and contraceptive use. So, we looked at the item difficulty to investigate. All items in the scale achieved the desired criteria of item difficulty similar to what was found in the UK [28] and the US for both English and Spanish speakers [29]; all items had $\leq$80% observations. However, our study had contraceptive use <10% observation and had lower contraceptive item variability (Var.=0.42) with 66% of the respondents were not using contraception before their latest pregnancy (score 2) [Table 2.]. This might be explained by the fact that Saudi women had a low prevalence of contraceptive use of around 29% [41].

Hypothesis testing established substantive validity for the Arabic LMUP. Similar to the original

LMUP in UK [28] and to the translated versions as in India [30], Malawi [31], and some other developing countries [12], our study found that women with higher parity are more likely than women with low parity to report their latest pregnancy as unplanned. Also, when comparing the results of this study with the original UK LUMP version [28], both showed that highly educated women are more likely than less educated counterparts to plan for their latest pregnancy. Also, the Brazilian version of the LMUP found that women with low education often do not plan for pregnancy [17]. However, the results of this study based in Saudi Arabia found different results than the Brazilian LMUP, as Saudi women with less education do indeed tend to plan for pregnancy. In fact, this study found that women with less education (primary and intermediate school) to be on the upper end of the LMUP score, with medians of 9.5 and 8 respectively, compared to a median of 10 in post graduate counterparts. This result might be explained by the fact that women with low educational attainment tend to invest in their fecundity as a tool for their social empowerment and personal satisfaction [9]. The tool scoring coherence with the population contraceptive attitude provides more evidence of the tool substantive validity. It might also explain the high trends of women who didn't use contraceptive use in the previous versions of the LMUP, as seen even in US (English 70.6%, Hispanic 68.5%)[29], India 90.5% [30], and Brazil 64.3% [17] .

Though the sample had almost the same urban /rural distribution as the population level (76% urban and 24% rural), this study did not find significantly different LMUP score in our analysis between women who live in rural and urban settings. This finding might be due to different factors, one being that contraceptive accessibility might be the same in both settings, as the Saudi Health care system services are free for citizens and most contraception is accessible over the

counter [59]. In addition, the distribution of educational levels is nearly the same in both settings, which seem to influence pregnancy planning behavior.

In this study's validation process, it is important to highlight the consequential aspect of validity, i.e. this validated tool output score should be interpreted cautiously [51]. For example, when measuring pregnancy planning, women who have no concern about the "right" timing or the number of children they have, and who also accept their pregnancy as God's will, should be considered fatalistic (believing in fate), rather than counting these pregnancies as unplanned or ambivalent [4]. For in the case of fatalistic women, they believe there is no need for planning in general, and therefore, when they have unplanned pregnancies, they do not perceive the negative consequences related to their lives, pregnancy and birth. Women of this belief system were seen in this analysis (not shown), and replied with answers such as: "I did not plan but I got pregnant and I'm happy "الحمدلله"/ "thank God." It should be noted that this perception of pregnancy was also noticed in settings other than Saudi Arabia [59], such as Latina and non-Hispanic white women in Texas [22], and from white and African American female study participants in Pennsylvania [21]. Further study should be conducted on whether or not to categorize these attitudes as risky and whether they could result in negative maternal and fetal outcomes.

The most important strength of this study is that it is the first to validate and utilize a tool that measures pregnancy planning in Arabic. This will facilitate the investigation of circumstances around pregnancy planning in the Arabic-speaking context and then correlate whether or not unplanned pregnancy has negative consequences. Furthermore, it will help identify women-at-risk and inform policy makers and family planning programs, thereby helping to improve maternal

health in the Arab world. The pilot and the data collection of the LMUP in Arabic was determined acceptable for two reasons. First, a large number of responses were received in a relatively short period of time. Second, no critiques or comments were received by email or phone. Also, there were no missing data in any of the items of the LMUP for individuals who were able to reach all questionnaire parts.

Another strength of this study is that it was the first validation of LMUP tool to use self-administered electronic data collection using social media platforms. The use of electronic data collection eased the data collection burden and costs on researchers. Also, electronic collection allows women to answer the survey in the setting of their choice, allowing them to feel more at ease while they are sharing their pregnancy planning behaviors. It also allows them to have as much-needed time for introspection. Also, this study may have avoided social norm bias by introducing electronic data collection. Therefore, the participant may feel more comfortable sharing sensitive information.

Our study had some limitations. First, the number of test-retest participants (24) was very low, accounting for only 2.5% of the total sample (796). With this small number, it is difficult to establish stability (i.e. weighted kappa) for all participants given that the limited number of people who did a retest could be attributed to the fact that we used highly specific deterministic data linkage (to ensure true person linkage), and it might be because of resource and time shortage e.g. they don't have time, internet, etc.

While limitation of the sample methodology mainly due to the convenience sample that would prevent generalizing the LMUP patterns to the overall population. However, compared to findings from other studies based on probability samples, our convenience sample was found to

have similar validity and reliability [Table 2.]. Also, the sample consisted of highly educated participants, which is not representative of the education levels of the Eastern Province 65% vs. 16% [41] who had at least bachelor degree. While having a sample of highly educated women may have resulted in an underestimation of unplanned pregnancy prevalence[9], it is beyond this study's objectives to measure the pregnancy planning rate.

Furthermore, the electronic data collection method introduced some limitations. For example, the study could not calculate the participation rate and the sample is limited only to people who have internet access. Also, we did not ascertain the pregnancy outcomes of the latest pregnancy as the US LMUP study did[29], and participants who ended their pregnancy with abortion might be more likely to report or participate in the study than women who had a live birth outcome. This might underestimate the frequency of unplanned or unwanted pregnancy. However, we had one participant who reported her pregnancy outcome in the preparation item by "I lost latest pregnancy, I didn't know I was pregnant" and other one said: "I had severe depression to the degree I wanted to have abortion". This illuminates the tool's ability to capture pregnancy outcomes in some instances.

Conclusion and Recommendations

In conclusion, in this study, the Arabic LMUP translated version for Saudi's Arabic-speaking women is valid and reliable according to internationally-accepted psychometric criteria [48, 51, 53, 61]. This LMUP version can be used with confidence in research studies as a measure of unplanned pregnancy. The translation was done based on formal Arabic and therefore can be easily understood in any Arabic setting.

Future research is needed to evaluate the association of pregnancy planning and pregnancy and other health outcomes in the Arabic context. A simple starting point would be to link medical records with the LMUP score [9] to investigate unplanned pregnancy and maternal and fetal outcomes. However, medical records may lack consistently recorded information on all outcomes of interest. As a matter of public policy, Saudi Arabia provides family planning consultation for each postpartum woman and documents follow-up information about pregnancy on antenatal cards at each primary healthcare (PHC) center. Also, using these community level PHC's antenatal clinics for measuring LMUP would be a great access point for women to confide their feelings about pregnancy and other more sensitive issues [9], such as intimate partner violence (IPV), which has been found to be associated with unintended pregnancy [35]. The LMUP can be used as a tool for purposes other than pregnancy planning. For example, it can be used to probe unmet family planning needs, contraceptive accessibility, acceptability, and knowledge. Though it should be noted, there might be limitations in using the LMUP as a tool for other purposes, i.e. the rate of unplanned pregnancy might be underreported by this measure (i.e. LMUP score varies as pregnant women tend to change their wantedness status after delivery) [20]. Furthermore, considering contraceptive use behavior might have cultural/societal attributes, or relationship/gender impact that would reflect barriers to family planning services [20].

Using qualitative research methods of in-depth interviews and focus group discussions may elucidate nuanced information about pregnancy planning that cannot be obtained from routine medical records. Furthermore, the prospective approach seems better for ascertaining planning; whereas the retrospective may be better for describing acceptance or happiness with pregnancy.

Women accepting a pregnancy may try to have a healthy pregnancy, and this can be done by asking women about whether or not they engaged in pregnancy preparation after finding out their current pregnancy status. Based on the answer to this question, studies can determine a woman's attitude toward planning rather than emotional acceptance/wantedness attitude, which might yield different pregnancy outcomes [12].

Further, future investigation of the association of unplanned pregnancy with voluntary or involuntary abortion is recommended. As unwanted pregnancy would be estimated clearly by including a Likert scale for wantedness; the higher level of unwantedness would reflect a deep rejection for the pregnancy. Also, such study would account for social factors, i.e. family support, community recourses, economic burden, as women who lack social support would opt for abortion or having mental impact. Additionally, assessing relationship stability, intimate partner violence, and women reproductive autonomy, would estimate risk of abortion as an outcome, as women in a non-cohabitating or in unstable relationship would not want her pregnancy and opt or induced or unsafe abortion.

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Appendix I. Translation and back translation of LMUP questionnaire

Below some questions about the circumstances surrounding the pregnancy and the time you felt about it. Please put the current pregnant or the last one (Choose the most appropriate phrase)

11. In the month in which I became pregnant me and my partner...

- ○ we didn't use contraception
- ○ we have been using contraceptives but not at all intimate practices.
- ○ we always use contraceptives but I know it failed (crackling, moved from his place , dislocated from his place , it doesn't work , etc..)
- ○ we always use contraception

12. I feel that my pregnancy was happening...

- ○ In the suitable time
- ○ good , but not in suitable time
- ○ not suitable time

13. Completely before pregnancy

- ○ I intend to be pregnant
- ○ my intention was unsteady
- ○ I didn't intend to be pregnant

14. Completely before pregnancy

- ○ I wanted to have a baby
- ○ I had mixed feelings to have a baby
- ○ I didn't want to have a baby

15. Before the pregnancy....

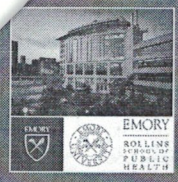
- ○ Me and my partner were agreed to become pregnant
- ○ we discussed to have children but , I didn't agree
- ○ we didn't discuss this issue

16. Before your pregnancy did you do anything to improve your health to prepare you ?

- ☐ I took Folic acid
- ☐ I stopped or reduced smoking

- [ ] My husband stopped smoking when I'm inside the house
- [ ] My Meals become healthier
- [ ] I searched for medical and health advices
- [ ] I didn't do anything from what is written above
- [ ] Other (please specify)

Thank you for filling the questionnaire, please refill this next week (after 7 days) if possible for once.



مقياس لندن للحمل غير المخطط له

إدناه بعض الأسئلة حول الظروف المحيطة بالحمل وشعورك بتوقيت حدوث الحمل **نرجو وضع الحمل الحالي (أو آخر حمل)** بالاعتبار عند الإجابة على الأسئلة التالية
(الرجاء اختيار العبارة **الأنسب**)

* 11.
في الشهر الذي اصبحت به حاملا، انا وشريكي...

- ◯ لم نستخدم مانع للحمل
- ◯ كنا نستخدم مانع للحمل , لكن ليس في كل الممارسات الحميمية
- ◯ دائما نستخدم مانع للحمل , لكنني أعلم ان المانع فشل (تشقق, تحرك من مكانه, انخلع عن مكانه, لم يعمل, إلخ)
- ◯ دائما نستخدم مانع للحمل

* 12. أشعر أن حدوث حملي كان ....

- ◯ في الوقت المناسب
- ◯ جيد, لكنه ليس في الوقت المناسب تماما
- ◯ في وقت غير مناسب

* 13. تماما قبل حدوث الحمل

- ◯ كنت أنوي أن أحمل
- ◯ نيتي بالحمل كانت متذبذبة
- ◯ لم أكن أنوي أن أحمل

* 14. تماما قبل حدوث الحمل

- ◯ كنت أرغب أن أرزق بطفل
- ◯ كانت لدي مشاعر مختلطه بأن أرزق بطفل
- ◯ لم كنت أرغب أن أرزق بطفل

في السؤال التالي, المتعلق حول شريكي

قبل حدوث

- ◯ أنا وشريكي كنا متفقين على أن أصبح حاملا
- ◯ أنا وشريكي تناقشنا على أن ننجب أطفالا ما بيننا، ولكن لم أوافق أن أصبح حاملا
- ◯ لم نناقش مطلقا أن ننجب أطفالا فيما بيننا

* 16. قبل حدوث الحمل، هل قمتي بأي شيء لتحسين صحتك لتهيئتك للحمل؟

(الرجاء اختيار كل ما هو مناسب من العبارات)

- ☐ أخذت حمض الفوليك
- ☐ توقفت أو قللت من التدخين
- ☐ توقف زوجي عن التدخين بوجودي او داخل المنزل
- ☐ أكلي أصبح صحيا أكثر
- ☐ بحثت عن نصائح صحية/طبية
- ☐ لم أفعل أي مما تم ذكره أعلاه قبل حملي
- ☐ اتخذت إجراء آخر، الرجاء الشرح

نشكر لك تعبئة الاستبيان، الرجاء إعادة تعبئة الاستبيان الاسبوع المقبل (بعد ٧ أيام) ان امكنك ذلك لمرة واحدة فقط

Appendix II. Consent form translation and back translation

جامعة إيموري

الموافقة على موضوع البحث

العنوان : التحقق من مقياس لندن لقياس الحمل الغير مخطط له للمرأه في الوطن العربي .

الباحث الرئيسي : ايمان المغاسله MBBS,MPH2017 قسم هوبرت للصحة العالمية , جامعة إيموري .

المقدمة :

انت مطلوب لتكون في دراسة بحثية , تم تصميم هذا النموذج ليخبرك بكل شي تحتاجه للتفكير قبل ان تقرر الموافقه لتكون ضمن الدراسة او لا تكون ضمنها. كليا هو اختيارك واذا قررت المشاركة يمكنك تغيير رأيك لاحقا والانسحاب من البحث .

قبل ان تأخذ قرارك

- الرجاء قراءة هذا النموذج بعناية او توكيل شخص اخر لقرائته
- الرجاء الاستفسار عن اي شي غير واضح

يمكنك طباعة نسخة من نموذج الموافقة للإحتفاظ به , واخذ الوقت الكافي للتفكير في ما اذا كنت ترغب بالمشاركة . اذا قدمت موافقتك لن تخسر اي شي من حقوقك القانونية .

نظرة عامة للدراسة :

تم تعريف الحمل الغير مقصود " الغير مرغوب " بالحمل الذي لم يتم التخطيط له مسبقا . ارتبط الحمل الغير مقصود بتأخير المتابعه للحامل في عيادة الأمومة , او بقلة زيارتها لمتابعة الحمل قبل الولادة او بالإجهاض المتعمد .وارتبط ايضا بنتائج سلبية سواء كان على الحامل او على الطفل حديث الولادة مثلا : تأخر النمو او زيادة مخاطر اكتئاب ما بعد الولادة .

حتى الآن لا يوجد طريقة موحدة في تقدير مستوى الحمل غير المقصود بة للنساء اللاتي يتحدثن العربية والتي اذا وجدت من الممكن ان تسهل قياس الحمل الغير مخطط له بدقة

من خلال هذه الدراسة نعتزم للتحقق من النسخة العربية لـ " مقياس لندن للحمل الغير مخطط له " حول 383 من نساء المملكة العربية السعودية اللاتي يتحدثن العربية وكان لهن حمل واحد على الأقل.

الإجراءات :

إذا وافقت على المشاركة في هذه الدراسة سيطلب منك استكمال 11 سؤال بشأن الظروف الحيطة بالحمل الأخير واستخدام وسائل منع الحمل والتوقيت والنية والرغبة في انجاب طفل والنقاشات مع الشريك والاستعدادات ما قبل الحمل وبعض الإحصائيات السكنية .

ننصح بتعبئة هذا الاستبيان الآن او في اي يوم من الاسبوع المقبل هذا سوف يساعدنا بقياس دقة المعلومات وذلك من خلال ادخال رقم المشتركين الذي سوق يظهر في الصفحة الأولى من الاستبيان . يرجى تصوير الشاشة لحفظ ذلك .

المخاطر والمشكلات:

المشاركة في هذه الدراسة تطوعي تماما وإجاباتك ستكون مجهولة.سوف تستغرق مشاركتك 3-5 دقائق . يمكنك عدم المشاركة وذلك لن يؤثر سلبا على حقوقك بأي شكل من الأشكال .

الفوائد:

تهدف هذا الدراسة الى المنفعة المباشره

تهدف هذه الدراسة للتحقق من صحة النسخة العربية من مقياس لندن لقياس الحمل الغير مخطط له (LMUP) لمساعدة الباحثين المهتمين بهذا الإجراء بالمستقبل في قياس الحمل الغير مخطط له للدول الناطقة باللغة العربية .

السرية :

بعض المكاتب واخرين غير الباحثين قد يطلعون على سجل الدراسة . ستقوم الجهات الحكومية وموظفين إيموري بالإشراف على سير الدراسة السليم لذا قد يطلعون على سجل دراستك .

هذه المكاتب تشمل مجلس جامعة ايموري للمراجعه المؤسسية ومكتب الإمتثال .

ستقوم ايموري بحفظ اي سجلات للبحوث وانشاء الخصوصية الى المدى المطلوب وذلك بموجب القانون.

سوف تستخدم رقم الدراسة بدلا من الاسم في تسجيل الدراسة كلما كان ذلك ممكن . لن نقوم بسؤالك عن اسمك او اي حقائق اخرى تشير اليك سوف تظهر البيانات مجهولة عند عرض الدراسة او نشر النتائج .

التطوع بالمشاركة والإنسحاب من الدراسة :

لديك الحق للإنسحاب من هذه الدراسة في اي وقت بدون عقوبه او مخالفة.

معلومات التواصل:

تواصل مع ايمان المغاسلة على الرقم 2219-825-404(001)

- اذا كان لديك استفسارات حول الدراسة او جزء منها
- اذا كان لديك اسئلة , قلق او شكاوي

تواصل مع مجلس جامعة ايموري للمراجعة المؤسسيه على الرقم 0720-712-404(001)

او على الايميل irb@emory.edu :

- اذا كان لديك استفسارات حول حقوقك كمشارك بالبحث
- اذا كان لديك اسئلة , قلق او شكاوي حول البحث
- يمكنك ايضا اخبار (IRB) بتجربتك كمشارك بالبحث من خلال تعبئة استبيان مشارك البحث

الموافقة:

يرجى الضغط على خانة الموافقة في حال موافقتك بالمشاركة في هذه الدراسة . يمكنك عدم المشاركة وذلك لن يؤثر سلبا على حقوقك بأي شكل من الأشكال.

Agree

Emory University
Consent to be a Research Subject

Title: Validation of the London Measure of Unplanned Pregnancy for Women of Arab Nations.

Principal Investigator: Eman Almaghaslah *MBBS, MPH 2017.* Hubert Department of Global Health, Emory University.

Introduction

You are being asked to be in a research study. This form is designed to tell you everything you need to think about before you decide to consent (agree) to be in the study or not to be in the study. **It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the research study.**

Before making your decision:

- Please carefully read this form or have it read to you
- Please ask questions about anything that is not clear

You can print a copy of this consent form, to keep. Feel free to take your time thinking about whether you would like to participate. By providing your consent, you will not give up any legal rights.

Study Overview

Unintended pregnancy is defined around pregnancy intendedness, wanted-ness, timing and planning considerations. It has been associated with late presentation to antenatal clinic, less antenatal care visits, or induced abortion. Also, maternal unhealthy behavior, adverse neonatal and birth outcome, developmental delay, and increase risk of postpartum depression. (Gipson et al., 2008; Abajobir et al., 2016).

Yet there is no unified method in estimating the level of unintended pregnancies for Arabic speaking women. Which if existed would help unintended pregnancy measurement accurately.

By this study we want to measure the accuracy of the Arabic version of the London Measure of Unplanned Pregnancy (a measure of pregnancy intention developed in United Kingdom), for 383 participant representing the Arabic speaking population world-wide who had at least one pregnancy.

Procedures

If you agree to participate in this study you will be asked to complete 11 questions concerning the circumstances around the last pregnancy in regards to contraceptive use, timing, intention, and desire to have a baby, discussion with the partner, preconception preparation and some demographic information.

You are advised to fill out the survey now and in any day of the next week, that will help us in measuring the data accuracy. That will be through entering the participant number, which will appear in the first page of the questionnaire. Please screen picture it on order to memorize it.

Discomforts

pation in this study is completely voluntary and your answers will be anonymous. It will take around 3-5 minutes. lure to participate will not adversely affect your rights in any way.

Benefits

This study is not designed to benefit you directly. This study is designed to validate the Arabic version of the London Measure of Unplanned Pregnancy (LMUP) to help interested researchers in the future measure unplanned pregnancy in Arabic-speaking nations.

Confidentiality

Certain offices and people other than the researchers may look at study records. Government agencies and Emory employees overseeing proper study conduct may look at your study records. These offices include the Emory Institutional Review Board, and the Emory Office of Compliance. Emory will keep any research records we create private to the extent we are required to do so by law. A study number rather than your name will be used on study records wherever possible. We will not ask you about your name or any other facts that might point to you, anonymous data wi appear when we present this study or publish its results.

Voluntary Participation and Withdrawal from the Study

You have the right to leave the study at any time without penalty.

Contact Information

Contact Eman Almaghaslah at (001) 404-825-2219:

- if you have any questions about this study or your part in it,
- if you have questions, concerns or complaints about the research

Contact the Emory Institutional Review Board at (001) 404-712-0720 or irb@emory.edu:

- if you have questions about your rights as a research participant.
- if you have questions, concerns or complaints about the research.
- You may also let the IRB know about your experience as a research participant through our Research Participant Survey at http://www.surveymonkey.com/s/6ZDMW75.

Consent

Please, click on agree button if you agree to be in this study. By providing your consent to participate, you will not give up any of your legal rights in any way.

☐ Agree

Appendix III. Expert rating questionnaire

التحقق من تلائم مقياس "لندن لقياس الحمل غير المخطط له" للمرأة بالمملكة العربية السعودية

Welcome to My Survey

الاستبيانة التالية ستكون حول الظروف المحيطة بالحمل للنساء الاتي انجبن طفل واحد على الاقل
وفيما يلي نستعرض معلومات الدراسة من ثم الرجاء تقييم ملائمة السؤال مع قياس التخطيط للحمل

· يُعرف الحمل الغير مقصود (الغير مرغوب) بالحمل الذي لم يتم التخطيط له مُسبقاً

· ارتبط الحمل الغير مقصود بتأخير المتابعة للحامل في عيادة الأمومة، او بقلة زيارتها لمتابعة الحمل قبل الولادة، أو بالإجهاض المتعمد.

· وارتبط ايضاً بنتائج سلبية سواء كان على الحامل او على الطفل مثلاً: تأخر في النمو، وزيادة مخاطر الإصابة باكتئاب ما بعد الولادة. (Gipson et al., 2008; Abajobir et al., 2016)

· حتى الآن لا توجد طريقة موحدة في تقدير مستوى الحمل غير المقصود به للنساء الاتي يتحدثن العربية. والتي إذا وجدت من شأنها أن تسهل قياس الحمل غير المخطط له بدقة.

· من خلال هذه الدراسة نعتزم للتحقق من ملائمة "مقياس لندن للحمل غير المخطط" للنساء بالمملكة العربية السعودية اللاتي كان لهن حمل واحد على الأقل.

· المشاركة في هذه الدراسة طوعي تماما وسوف تستغرق مشاركتك ٣-٥ دقائق، خلالها يُطلب منك اكمال قسمين من الاسئلة: الاول يتعلق ببعض البيانات الشخصية والثاني بالظروف المحيطة بالحمل الاخير. استرجاع الظروف المحيطة بالحمل من الممكن ان يشعرك بعد الراحة، يمكنك عدم المشاركة وذلك لن يؤثر سلبا على حقوقك بأي شكل من الأشكال.

فريق البحث:

اسم الباحث: إيمان المغاسلة M.B.B.S. MPH
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اسم المشرف: روجر روشا M.D.
أستاذ باحث ومدير الدراسات العليا، قسم هوبرت للصحة العالمية / جامعة إيموري.

التحقق من تلائم مقياس "لندن لقياس الحمل غير المخطط له" للمرأة بالمملكة العربية السعودية

البيانات
الشخصية

* 1 المرتبة العلمية

- أطبيب مقيم أمراض نساء وولادة
- أخصائي أمراض نساء وولادة
- استشاري أمراض نساء وولادة
- أخرى (يرجى التحديد)

* 2 المنطقة

- الرياض
- مكة المكرمة
- المدينة المنورة
- القصيم
- المنطقة الشرقية
- عسير
- تبوك
- حائل
- الحدود الشمالية
- جازان
- نجران
- الباحة
- الجوف
- أخرى (يرجى التحديد)

* 3 سنوات الخبرة

التحقق من تلائم مقياس "لندن لقياس الحمل غير المخطط له" للمرأة بالمملكة العربية السعودية

Welcome to My Survey

شكرا لك على المشاركة في استطلاع الرأي

الاستبيانة التالية ستكون حول الظروف المحيطة بالحمل للنساء الاتي انجبن طفل واحد على الاقل
الرجاء تقييم ملائمة السؤال مع قياس التخطيط للحمل

الظروف المحيطة بالحمل

ادناه بعض الأسئلة حول الظروف المحيطة بالحمل وشعورك بتوقيت حدوث الحمل. **نرجو وضع الحمل الحالي (أو آخر حمل)**بالاعتبار عند الإجابة على الأسئلة التالية
(الرجاء اختيار العبارة **الأنسب** لك)

* 4 في الشهر الذي اصبحت به حاملا، انا وشريكي...

- لم نستخدم مانع للحمل
- كنا نستخدم مانع للحمل، لكن ليس في كل الممارسات الحميمية.
- (دائما نستخدم مانع للحمل، لكنني أعلم ان المانع فشل (تشقق، تحرك من مكانه، انخلع عن مكانه، لم يعمل, إلخ
- دائما نستخدم مانع للحمل

- ذات صلة وثيقة
- ذات صلة
- ذات صلة قليلة
- ليست ذات صلة

يرجى إدخال تعليق.ان وجد

* 5 أشعر أن حدوث حملي كان .....

- في الوقت المناسب
- جيد، لكنه ليس في الوقت المناسب تماما
- في وقت غير مناسب

- ◯ ذات صلة وثيقة
- ◯ ذات صلة
- ◯ ذات صلة قليلا
- ◯ ليست ذات صلة

يرجى إدخال تعليق.ان وجد

* 6 تماما قبل حدوث الحمل

- كنت أنوي أن أحمل
- نيتي بالحمل كانت متذبذبة
- لم أكن أنوي أن أحمل

- ◯ ذات صلة وثيقة
- ◯ ذات صلة
- ◯ ذات صلة قليلا
- ◯ ليست ذات صلة

يرجى إدخال تعليق.ان وجد

7 * تماما قبل حدوث الحمل

كنت أرغب أن أرزق بطفل

كانت لدي مشاعر مختلطة بأن أرزق بطفل

لم أكن أرغب أن أرزق بطفل

- ذات صلة وثيقة
- ذات صلة
- ذات صلة قليلا
- ليست ذات صلة

يرجى إدخال تعليق.ان وجد

-في السؤال التالي، المتعلق حول شريكك... ،

8 * قبل حدوث الحمل

- انا وشريكي كنا متفقين على أن أصبح حاملا
- انا وشريكي تناقشنا على أن ننجب أطفالا ما بيننا، ولكن لم أوافق أن أصبح حاملا
- لم نناقش مطلقا أن ننجب أطفالا فيما بيننا

- ذات صلة وثيقة
- ذات صلة
- ذات صلة قليلا
- ليست ذات صلة

يرجى إدخال تعليق.ان وجد

9 * قبلحدوث الحمل، هل قمتي بأي شيء لتحسين صحتك لتهيئتك للحمل؟

(الرجاء اختيار كل ما هو مناسب من العبارات)

- أخذت حمض الفوليك
- توقفت أو قللت من التدخين، المعسل، او الشيشة
- توقف زوجي عن التدخين بوجودي او داخل المنزل
- أكلي أصبح صحيا أكثر.
- بحثت عن نصائح صحية/طبية
- اتخذت إجراء آخر، الرجاء الشرح_____

أو

- لم أفعل أي مما تم ذكره أعلاه قبل حملي

- ذات صلة وثيقة
- ذات صلة
- ذات صلة قليلا
- ليست ذات صلة

يرجى إدخال تعليق.ان وجد

تقيمك ورأيك مهم لصحة عمل الدراسة

لأي رأي او استفسار يرجى التواصل عن طريق

الايميل: e.almaghaslah@gmail.com

آو 00966503833226

0014048252219

وشكرا