A Healthy Mother and Baby through Optimal Timing and Spacing of Pregnancy

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Abstract

One of the strategies that can assist to improve maternal and newborn outcomes in Malawi is the provision of preconception care. Most of the problems that affect the neonates and their mothers occur before pregnancy and during organogenesis. Men and women of childbearing age need appropriate advice and healthcare to assist them to have healthy maternal and newborn outcomes. Persistent use of family planning and healthy timing and spacing of pregnancy could assist in reducing some of the causes of the maternal and infant mortality rate. Preconception health should be promoted through the use of family planning methods at a recommended time to have a healthy pregnancy. A quantitative descriptive non-experimental design was used to examine the use of preconception interventions at health centres in the urban areas of Blantyre, Malawi. Information was collected from 300 men and women of childbearing age between 18 and 35 years that had a pregnancy and intended to get pregnant in five years. The major findings indicated that information on optimal timing and spacing of pregnancy should be provided to men and women of childbearing age and that there should be adequate use of family planning methods. There were mixed messages on healthy timing and spacing of pregnancy as 32.8 per cent of the participants indicated that pregnancy should be spaced in 1 to 2 years and 23.5 per cent indicated that pregnancy should be spaced more than 5 years. About n = 196 (64.9%) had one to two children. Healthcare providers should provide guidelines on healthy timing and spacing of pregnancy through preconception care that would enable men and women of childbearing age to access information and care to improve pregnancy outcomes.

Keywords: healthy timing and spacing of pregnancy; family planning methods; maternal health; newborn health; unintended pregnancy; preconception care

Introduction and Background Information

Preconception care includes reproductive health planning through the use of contraceptives that prevent unintended pregnancy. Preconception care can be achieved in adolescents and women of childbearing age through healthy timing and spacing of pregnancy, which is a concept that assists adolescents and women of childbearing age to have pregnancies at the right time and interval and when there are minimal risks anticipated after the pregnancies (WHO 2015, 1). There have been interventions and strategies to improve maternal and neonatal health in Malawi like antenatal care but there is still a high maternal mortality rate which is 439/100 000 live births (Malawi 2015–16). Preconception care should be provided to all men and women of childbearing age including adolescents to reduce the adverse effects that occur to the mother and baby causing prematurity, small-for-gestation age, preeclampsia, and neural tube defects. Mason et al. (2014, 1) defined preconception care as the provision of biomedical, behavioural and social interventions to women and couples before conception occurs to deal with health problems and behaviours that could cause adverse effects to the mother and the baby. Specific interventions like healthy timing and spacing of pregnancy through the use of family planning methods would improve the health outcomes of the mother and the baby during the preconception period.

One of the strategies that can assist to improve maternal and newborn outcomes in Malawi is the provision of preconception care by optimal spacing and timing of pregnancy. Most of the problems that affect the neonates occur during organogenesis. Some problems like congenital abnormalities and intra uterine growth retardation can be reduced before conception by proper timing and spacing of pregnancies. Babies born to women with intervals that are shorter than six months have adverse neonatal and perinatal outcomes (DaVanzo et al. 2007, 1084; Sridhar and Salcedo 2017, 1; Yakoob et al. 2009, 1). Muganyizi and Mageta (2013, 2) highlight that healthy timing and spacing of pregnancies means that pregnancies are scheduled at an appropriate time, spaced at a recommended interval and limited according to an individual's need. Optimally spaced births should come at intervals of 18–23 months when it is recommended as ideal and reduce the risk of perinatal outcomes (Yakoob et al. 2009, 5).

Women are at lower risk when pregnancies are timed at 18 to 34 years old, birth spacing 2 to 3 years after each birth (Hope through Healing Hands 2019). Optimal timing and spacing of pregnancy is an intervention to help women and their families delay or space their pregnancies to achieve the healthiest outcomes for the women, and their newborns, infants, and children (WHO 2015). Schwandt et al. (2017, 1) highlighted that inadequate birth spacing is rated as riskier than all contraceptive methods as pregnancies that are mistimed before age 18 and spaced less than two years are associated with many risks like stillbirths, preterm births and low birth weights (Reime, Schücking, and Wenzlaff 2008, 1). Healthcare providers should be informed of the benefits of preconception care to assist clients with interventions that would improve birth before conception.

Preconception care through the use of family planning services would assist women to time and space the pregnancies to have a healthy outcome during the antenatal period. Bazile et al. (2015, 9) conclude that for Malawi to improve maternal and neonatal mortality, one of the strategies to put in place to achieve good health is by ensuring the provision of contraceptive options to all men and women of reproductive age. Men and women of childbearing age would utilise preconception interventions if healthcare providers are able to provide the information to the clients. Unfortunately, there are no preconception guidelines to assist healthcare providers to give optimal care to clients before conception.

Women that have closely spaced pregnancies before 24 months after birth have about 66 per cent more chance of dying during their pregnancy than women that have pregnancies at recommended intervals. Babies have a greater chance of being born premature, with low birth weight and small-for-gestation age if spaced closely before 24 months after birth (Dean et al. 2014, 6). Most pregnancies that are unintended and closely spaced end in miscarriage.

Problem Statement

Preconception care is one of the strategies that would assist men and women of childbearing age to have better outcomes of their pregnancies through optimal timing and spacing of pregnancies. The challenge is that information on healthy timing and spacing of pregnancy that can be achieved through the use of family planning is not provided to men and women of childbearing age. Mistimed pregnancies at the age of less than 18 years are highly associated with risks like preterm births, abortions, preeclampsia and birth injuries to the mother. These problems can be reduced if pregnancies are avoided during the adolescent period through the use of contraception. Pregnancies that come at short and long intervals have some detrimental effects to the mother and the fetus. The appropriate time to space pregnancies is between two to three years after a previous birth when the mother is in optimal health to carry a pregnancy. Health risks to the mother and the fetus are reduced if pregnancies are spaced within the recommended intervals. Men and women of childbearing age need to be aware of the recommended timing and spacing of pregnancy to have better pregnancy outcomes. The consequences of late contact to healthcare lead to adverse effects that are detrimental to maternal and newborn outcomes. The maternal mortality rate for Malawi is 439/100 000 live births, which is still very high (Malawi 2015–16, 8). Some of the deaths can be prevented through proper timing and spacing of pregnancy among men and women of childbearing age. Healthcare providers should be equipped to empower men and woman of childbearing age with healthy timing and spacing interventions that would improve health through the use of family planning methods.

Purpose of the Study

The research purpose was to identify the preconception care that is available in Malawi, to identify the gaps that exist, and to develop appropriate strategies that would assist in reducing the maternal mortality rate that is very high in Malawi. Preconception care is not highly emphasised in the provision of maternal and newborn health that can assist in reducing the detrimental effects during pregnancy to have a healthy mother and baby. One of the interventions of preconception care is the use of family planning methods to assist individuals and couples in timing and spacing their pregnancy optimally to have a healthy outcome after their pregnancy despite other interventions like risk screening, maintaining nutrition and preventing risky behaviours like taking drugs and alcohol.

Definitions of Keywords

Family planning methods: There are different methods of contraception used to time and space pregnancy at the optimal time when risks are reduced, for example pills (*Oxford English Dictionary*, s.v. "family planning methods").

Healthy Timing and Spacing of Pregnancy: An intervention to help women and families make an informed decision about the delay of the first pregnancy and the spacing or limiting of subsequent pregnancies to achieve the healthiest outcomes for women, newborns, infants and children. Clients should have access to free contraceptives and be informed of the contraceptive choices taking into account fertility intentions and desired family size as well as the social and cultural contexts (WHO 2015, 1).

Maternal health: The health of women during pregnancy, childbirth and the postpartum period. It encompasses the healthcare dimensions of family planning, and preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality (WHO 2015, 1).

Neonatal health: The state of the well-being of a baby just born and up to 28 days of life, and the factors during pregnancy that could influence the wellness of the newborn (Sellers 2018, 585).

Preconception care: A set of interventions such as risk screening, nutrition, treatment of infections and spacing and timing of pregnancy that aims to identify and modify biomedical, behavioural and social risks to a woman's health or pregnancy outcome through prevention and management (Dean et al. 2014, 2).

Unintended pregnancy: Unplanned pregnancy is a core concept that is used to better understand the fertility of populations and the unmet need for contraception (birth control) and family planning that would occur owing due to the lack of timing and spacing of a pregnancy (*Oxford English Dictionary*, s.v. "unintended pregnancy").

Research Methodology

Design

A quantitative, non-experimental descriptive-correlation design was used in this study using a questionnaire to explore the practices of men and childbearing women in relation to preconception care (Burns and Grove 2009, 237). Polit and Beck (2010, 184) illustrate that cross-sectional studies are appropriate for describing the status of the phenomena at a fixed point in time. In this study, these refer to behaviours and practices of the people of childbearing age between 18 to 35 years before conception like spacing and timing of pregnancy. Polit and Beck (2012, 236) maintain that the purpose of descriptive studies is to observe, describe and document aspects of a situation.

Study Population

In this study, the population comprised men and women of childbearing age intending to get pregnant (Bryman 2012, 187; Burns and Grove 2009, 342; Polit and Beck 2010, 306). The population of people receiving healthcare services in these clinics are: 221 227 from Ndirande, 114 858 from Limbe, and 147 678 from Mpemba (Maoulidi 2013, 21). A sample size was calculated using the number of clients that attended the three clinics. Their ages were between 18 to 35 years. These men and women had to be able to speak Chichewa or English, and had to have their healthcare provided in the Blantyre urban community health facility.

Study Setting

The accessible population in this study was from the three government health centres that provided family planning services, under-five clinics, and treatment of minor ailments. The study was conducted at healthcare clinics in communities surrounding the Blantyre urban city and the data were collected from men and women of childbearing age attending family planning, gynaecological and under-five clinics.

Sample and Sampling Technique

The probability sampling method was used to allow each member to have the chance to be chosen for the sample. Every member or element of the population had a probability higher than zero of being selected to the sample so that there is representativeness of the population (Burns and Grove 2009, 346). To develop appropriate interventions in preconception care that would be applicable to the people before conception there was a need for a representative sample. The inclusion criteria included men and women of the reproductive age that are intending to get pregnant between the ages of 18 to 35 years, and with at least one child. Accordingly, the study used probabilistic sampling where subjects were selected from a large number of individuals that were representative of the population or a representative segment of the population. Subjects were selected randomly so that each individual had a chance of being selected (Creswell and Plano Clark 2011, 174). Since the population of the clients that attend the three

clinics was known, it was possible to use a systematic sampling method. Systematic sampling involved selecting every K^{th} individual on the list (Burns and Grove 2009, 349). A starting point was chosen randomly in a queue as clients report to the clinics. In systematic sampling, each participant had an equal chance of participating in the study; hence sampling bias was minimised (Polit and Beck 2010, 315). A sampling interval was calculated which was the standard distance between the selected elements and was calculated by dividing the population (N) by the sample size (n), for example $I = N/n$ (Polit and Beck 2010, 315).

Size of the Sample

A sample size that is representative to the total population was calculated to have findings that can be generalised to the entire population. In quantitative research, the sample size can be determined by using a statistical computation (Hami 2012, 84). In this study, the accessible population was the clientele of men and women of childbearing age that were attending family planning, under-five and outpatient clinics at community health centres. To calculate the sample size that is representative of the study population Slovin's formula was used. Andale (2012, 1) highlights that a formula helps to calculate a sample from a known population.

Slovin's Formula

$n = N/ (1+ Ne^2)$

n = the sample size

N = the known population

e = the desired margin error or error tolerance which is taken at 95% confidence interval (0.05). The sample is being calculated from the total number of expected population. The calculated sample size was 300.

Data Collection Process

The data were collected using a developed structured questionnaire adapted from a study done in Texas on preconception care (Delissaint 2008, 10). Permission was granted to use the questionnaire and to adapt it according to the parameters that were suitable in Malawi. The instrument used in this study was adapted from a study done in Texas and it was modified into sections of demographic data that included education, gender, religion, age, parity and occupation. Information on healthy timing and spacing of pregnancy that included the period between pregnancies after a live birth, stillbirth and abortion was collected to determine the knowledge that the men and women had. A pretest of the questionnaire was done at Queen Elizabeth Central Hospital and the results were not included in the study results. The data collection was done through face-to-face interviews. The data collectors were recruited from nurses and midwives depending on their availability for training and data collection. Training was done on the purpose of the study and its objectives, how to collect data using the questionnaire, and the ethics

observed when conducting the study (Kothari 2004, 99). The data collectors needed to be fluent in English and Chichewa. A statistician was consulted who refined the questionnaire so that the items can easily be computed using SPSS version 20.0.

Validity and Reliability

The questionnaire was reviewed by a language and reproductive health specialist to ensure that the questions were clear and collected the data intended. The questionnaire was adapted from a study done in Texas and components of existing data were used such as demographic data, risks screening and behaviours during the preconception period. A pretest showed that that the instrument was reliable, with good predictive validity and sensitivity. Cronbach's alpha coefficient was 0.657 for all the items and a Spearman rank correlation coefficient was 0.817 ($p < 0.001$), which indicated the reliability of the instrument. The tool was translated to the Chichewa language for clarity of the content that was corrected.

Ethical Consideration

The Higher Degrees Committee of the Department of Health Studies at the University of South Africa and the College of Medicine Ethical Committee reviewed the proposal and granted permission to conduct the study. Permission was also granted to conduct the study at the study sites by the Deputy Hospital Director of Queen Elizabeth Hospital where the pilot study was done and the District Health Officer for Blantyre urban health centres where the study was done.

Recruitment of research assistants was done and these were nurses and midwives who were trained on the proper handling of respondents with respect and dignity. During the data collection the respondents were informed of the purpose of the study and its benefits. The respondents were provided with an informed consent form to participate in the study. They were informed that they were free to withdraw from participating in the study at any time in the course of the interview without any penalty. Each respondent was provided with a lunch allowance and transport. All records were put in a lockable cupboard to ensure safety and confidentiality.

Data Analysis

The numerical data were analysed using the computerised statistical Package for Social Sciences (SPSS) version 20.0. The findings were displayed in tables, charts, frequency distribution tables, proportions and percentages. Cross tabulations were done in order to visualise the summarised data related to two variables within the study sample. The significance of association between variables was done using the chi-square (X^2) test as P-values were calculated to evaluate whether a relationship between the variables was statistically significant. The level of significance was set at .05 or .01. The Fisher exact test and the Kruskal Wallis test were used to assess whether there is a significant association between a specific variable and the clients' knowledge on preconception

care. An analysis of variance was used to investigate the association between a continuous variable and knowledge on preconception care.

Results of the Research Study

Table 1 presents the results regarding the demographic data of the participants in relation to their knowledge of preconception care (healthy timing and spacing of pregnancy).

Table 1: Association of demographic data in relation to preconception care knowledge

Item	Statistics (X^2)	Df	P	Md
Age group	3.077	2	.21	22
Gender	1.803	1	.18	22
Marital status	5.233	4	.26	22
Tribe	13.661	7	.05*	22
Religion	24.166	14	.04*	22
Health centre	22.166	2	< .001*	22
Number of children	0.429	3	.93	22
Number of pregnancies	5.295	4	.26	22
Education	28.75	5	< .001*	22
Occupation	25.741	7	< .001*	22

Df = degrees of freedom, X^2 = Chi square, P = probability, Md = median, F = Fisher's exact test, * = significant result

The results indicated that regarding healthy timing and spacing of pregnancy the following biodata showed some statistical significance to knowledge on healthy timing and spacing of pregnancy: Tribe, religion, health centre, education and occupation.
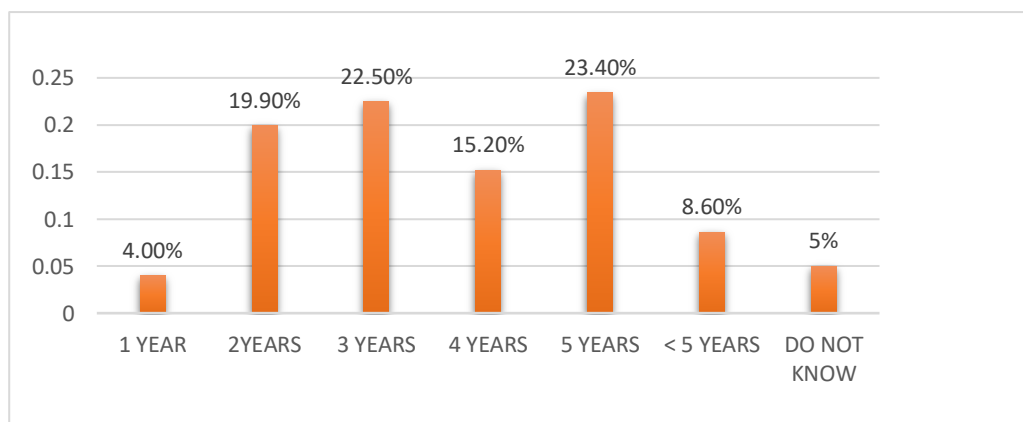

Figure 1: Healthy timing and spacing of pregnancy

Figure 1 shows the results on the healthy timing and spacing of pregnancy, in which n = 12 (4.0%) of the respondents thought the best time to space the pregnancy is one year. In contrast, n = 60 (19.9%) of the respondents thought it could be two years. Over two-thirds (n = 68; 22.5%) of the respondents thought it to be four years. Moreover, the majority (n = 72; 23.4%) of the respondents thought the best timing to have the pregnancy is five years. Those that responded that the best time should be more than five years were n = 26 (8.6%), and n = 17 (5%) did not know the best timing for pregnancy (see Table 2 and Figure 1). This shows a knowledge gap in preconception care and that clients needed specific information on timing and spacing of pregnancies.

Use of Family Planning Methods

Figure 2 indicates the family planning methods used by clients to practice healthy timing and spacing of pregnancies and to achieve the provision of preconception care.
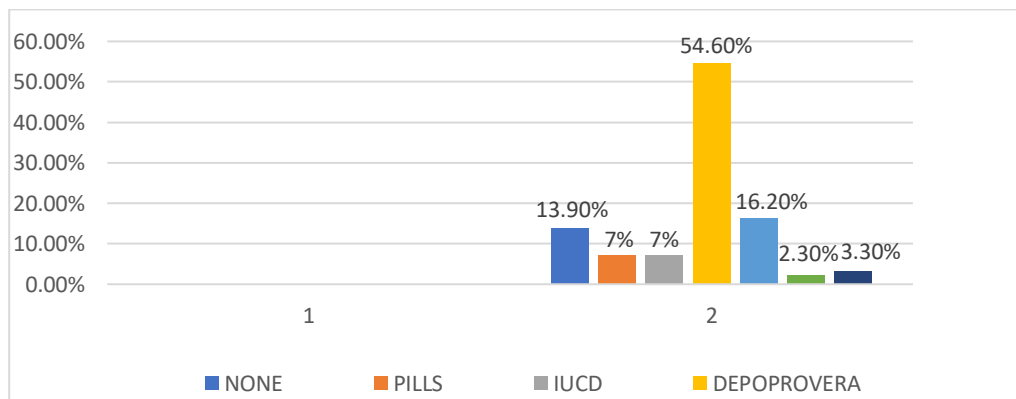

Figure 2: Family planning methods

Table 2: Reproductive health data

Preparation before pregnancy	Yes	No
	n (%)	n (%)
Want to get pregnant again	208 (69.3)	92 (30.6)
Had a sex encounter during the last six months	233 (77.6)	67 (22.3)
Used a condom during the last sex encounter	93 (31)	207 (69)
Use a family planning method	228 (76)	72 (24)
Would your partner like more information about planning a pregnancy	228 (76)	72 (24)
Benefits of family planning:		
• Mother has good health before pregnancy	245 (81.6)	55 (18.3)
• Baby grows well with enough care	272 (90.6)	28 (9.3)
• Income of the home is saved	144 (48)	29 (9.6)
• Responsibilities are reduced	136 (45.3)	164(54.6)
• Social services are enough for the country	130 (43.3)	170 (56.6)

Most of the respondents were sexually active and wanted to have more information on reproductive health as 228 (76%) of the partners wanted more information on family planning methods.

Discussion of Research Results

The number of respondents was 300 men and women of childbearing age that consented to participate in the study. Tribe, health centre, religion, occupation and education had a significant value to the level of preconception knowledge among respondents (see Table 1). Some demographic characteristics are to be taken into consideration when providing preconception care messages. Healthy timing and spacing of pregnancy as a strategy to promote a healthy pregnancy should be provided while considering some of the demographic characteristics that are significant to the provision of preconception care. (See Figure 3.)

Intervention/strategy: HEALTHY TIMING AND SPACING OF PREGNANCY

HTSP message to achieve healthy pregnancy outcome:

- Delay the first pregnancy by using FP method of choice until 18 years old before trying to get pregnant.
- Couples should use effective FP method of choice continuously for two years before trying to get pregnant after a live birth.
- Couples can use effective FP method of choice continuously not more than five years as there are adverse effects.

Figure 3: Summary of healthy timing and spacing of pregnancy messages

Healthy Timing and Spacing of Pregnancy

Most of the respondents in the study believed that the appropriate healthy timing and spacing of pregnancy is more than three years and less than two years. This indicated a knowledge gap among the participants. From a study conducted in Tanzania, Muganyizi and Mageta (2013, 4) indicated that healthcare providers should intensify educational messages on timing and spacing of pregnancy to promote healthy outcomes. Literature concurs that babies born to women with intervals that are shorter than six months, have an increased risk of many adverse neonatal and perinatal outcomes (Sridhar and Salcedo 2017, 1). When pregnancies are scheduled at an appropriate time, spaced at a recommended interval and limited according to an individual's need, the outcome is with minimal risks. Sarkar et al. (2015, 1) highlight the importance of having community-based interventions that consist of counselling of young married women, family and community on effective measures like increasing contraceptive use, timing pregnancy and improving pregnancy care.

Couples and individuals of a reproductive health age should acquire important messages on spacing and timing of pregnancies. Conversely, optimally spaced births which should come at intervals of 18–23 months were recommended as ideal and reduce the risk of perinatal outcomes (Yakoob et al. 2009, 5). Short inter-pregnancy intervals cause an increase in preterm births, low birth weight and small-size-for gestation age. The postnatal period provides a specific opportunity for counselling on family planning that would assist mothers to have time to rest before another pregnancy. Malawi has an increase in preterm births because of closely spaced pregnancies, especially after an abortion or a stillbirth. The common practice of men and women of childbearing age is that there is a need to have another pregnancy as soon as they experience pregnancy loss. Tilahun, Dadi, and Shiferaw (2017, 4) found that frequent abortions happen to women that have had a previous abortion. Family planning programmes will help women who want to delay a pregnancy or avoid meeting these stated fertility desires (Speizer and Lance 2015, 10). The use of contraceptives among women of childbearing age will assist them with planned pregnancies and reduce complications associated with childbirth.

Lassi et al. (2014, 2) highlight that a shorter inter-pregnancy interval less than six months is associated with higher preterm births, low birth weight, foetal death, and small-for-gestation age. Figure 2 indicates that the family planning methods used by clients, and mostly Depo-Provera and implants, are long-term family planning methods ideal for timing and spacing of pregnancy. Men and women of childbearing age should have their pregnancies at recommended birth intervals. There is still evidence that risks of adverse pregnancy effects were higher if the pregnancy was conceived after an interval of 60 months or more.

Limitations of the Study

The study was conducted at only three clinics of the southern part of Malawi in an urban area despite the majority of the Malawian population being concentrated more in rural areas. Time and financial constraints limited the researcher to conduct the study at a larger scale as the study was conducted to fulfil the requirements of pursuing a doctor of philosophy degree in health studies at Unisa. However, the findings cannot be generalised to the whole Malawian population to obtain the factors that could influence the provision of preconception care.

Recommendations

There should be an availability of wellness care clinics where individuals, couples and families could access the information and care on spacing and timing of pregnancy and the use of reproductive health services. Some of the interventions and information should be provided during any encounter with clients that come to the healthcare facility for antenatal care, under-five clinics, the family planning clinic and the postnatal clinic to create an awareness of preconception care. The provision of preconception care

should include adolescents and adults to improve the health of the mother and the baby. The same study should be done in Malawi on a large scale to initiate preconception services that include timing and spacing of pregnancy.

Conclusion

The study findings indicated that men and women of childbearing age did not have adequate knowledge on timing and spacing of pregnancy and reproductive health planning. The use of family planning methods would assist couples to time and space their pregnancy in order to have a healthy outcome of the mother and the baby, but the family planning methods were used by only a few respondents. The guidelines on preconception care should include the optimum use of family planning methods that can assist clients to time and space pregnancies optimally.

Acknowledgements

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