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Factors related to preterm birth mothers in Bangladesh

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ABSTRACT

Preterm birth has impact on infant and maternal health. In Bangladesh, the rate of preterm birth is around 14.1% of live births and 2nd leading cause of infant mortality and morbidity. Proportion of 45% of new born deaths occurs due to the complications from preterm birth. Maternal nursing care might influence in the reduction of preterm birth and promote maternal and infants health outcomes. The aim of this study is to explore the factors related to preterm birth mothers in Bangladesh. A descriptive correlational design was conducted among 100 preterm birth mothers selected by using convenient sampling method. Descriptive and inferential statistics were used for analyzing the data. Finding shows that approximately 70% participants were from low income family and more than 40% of the participants have no formal education. 26% of them had never prenatal care and mother working experiences outside ($p= .017$) and mother who had burning sensation during urination were significantly ($p = 0.019$) higher gestational age. Housewife might have worse health conditions, which can affect to gestational age, and women who had burning sensation during urination might have close medical attention which could longer gestational age. To identify factors related to gestational age, further study should include not only preterm birth mother, but also all pregnant mother.

INTRODUCTION

Preterm birth is estimated that more than 1 in 10 or 15 million babies born in 2010 worldwide were premature, of which more than 1 million babies died as a result of preterm birth and related complications (Shah et al., 2014; Gebreslasie, 2016; Bekele, Demeke & Dugna, 2017). In 2013, the preterm birth rate in the United States was 12% (Asl, Safari & Hamrah, 2017; Passini et al., 2014). Premature birth is a major health concern in Southern Asia, with 85% of global premature births being attributed to Asia and Africa, of which in South Asia and Sub-Saharan Africa alone contributing to around 60% (Tehranian, Ranjbar & Shobeiri, 2016; Asl et al., 2017). The highest rate of preterm birth was reported in Africa and North America, and the lowest was reported in Europe; 11.9%, 10.6% and 6.2% of live births respectively (Abdel Hady & Abdel Wahid, 2015; Salam Raham, Raihana & Arifeen, 2014).

The rate of preterm birth in Bangladesh is around 14.1% of live birth (Salam et al., 2014). Proportion of new born deaths due to complications from preterm birth is 45% (Begum, 2014). Different studies reported the incidence of preterm birth to be 22.3%, of which late preterm, moderate preterm and very preterm were 12.3%, 7.1% and 2.9% of live births respectively (Banu, 2014). Another study conducted in Sylhet between 2007 and 2009 reported the incidence of preterm birth to be 22.3% of live births. Births and relevant complications accounted for around 11% of neonatal mortalities in 2011. Bangladesh was ranked 7th out of the ten countries with the highest number of preterm births in 2010 (Salam et al., 2014; Banu, 2014).

Preterm birth is defined as delivery occurring before 37 completed weeks of gestation (Banu, 2014; Abdel Hady et al., 2015). This occurrence is the second leading cause of infant mortality, neonatal morbidity (Ricci, 2013; Asl et al., 2017),

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and long term disability among normal formed infant (Cnattingius et al., 2013). Preterm birth is a syndrome induced by multifactorial aetiology (Passini et al., 2014). These factors include sociodemographic, obstetric gynecologic and health related factors (Salam et al., 2014). Sociodemographic factors include smoking, stress, young or advanced maternal age, low maternal BMI, obesity and long standing posture (Sarhan & Anini, 2015). Obstetric gynecological factors include preterm birth hemorrhage, number of pregnancies, interval of pregnancies, pre eclampsia and eclampsia (Passini et al., 2014; Shah et al., 2014; Tehranian et al., 2016). Other study found that medical related factors influence the preterm birth such as urinary tract infection, renal disease, hypertension, obesity, thyroid disorder and diabetes (Salam et al., 2014; Asl et al., 2017).

Despite technological advances in the care of preterm newborns in recent decades, prematurity is still one of the main causes of neonatal morbidity and mortality (Temu, Masenga, Obure, Mosa & Mahande, 2016; Tehranian et al., 2016; Bekele et al., 2017). This is complications inherent to prematurity such as intracranial hemorrhage, retinopathy of prematurity, organ dysfunction and impaired psychological development, are often deadly even with medical care (Salam et al., 2014). One third of even those who survive often suffer from severe long term neurological disabilities (Bekele, Amanon & Gebreslasie, 2015) such as cerebral palsy or mental retardation, hearing impairment, and visual impairment (Tehranian et al., 2016; Asl et al., 2017). Furthermore, preterm infants carry increased risk of a range of neuro developmental impairments and disabilities, including behavioral problems, school learning difficulties (Bekele et al., 2017), chronic lung disease, long term cardio vascular issues, motor dysfunction, and lower growth attainment are among the most common conditions reported as long term sequelaes of preterm births (Ballot, Potterton, Chirwa, Hilburn & Cooper, 2012; Shah et al., 2014; Lu, Qu, Tang, Chen & Mu, 2015; Asl et al., 2017). The risk of cognitive impairment, schizophrenia, autism, attention deficit disorder, anxiety and chronic depression is also higher for preterm infants (Salam et al., 2014; Ballot et al., 2012).

Even though there is ample literature on preterm birth, those focusing on the nursing perspective are not available in Bangladesh. The knowledge gained from the study will thus enhance nurses' abilities to provide better care for pregnant women at risk for preterm. Knowing the most common risk factors contributing to preterm birth will better guide nurses in providing the right medical strategies to prevent worsening of the risk factors and improve intervention programs for specific cohorts and that cohort's risk factors. Moreover, the study will assist health care providers reduce the rates of neonatal and infant mortality by identifying risk factors that should be assessed in every pregnant woman. Therefore, the aim of this study is to explore the factors related to preterm birth mothers in Bangladesh.

MATERIALS AND METHODS

Study Design

A descriptive cross sectional study was used to explore the factors related to preterm birth mothers in Bangladesh.

Study participants

The target population was post-natal mothers who delivered preterm baby (gestational age between 28 to below 37 weeks) at Shaheed Ziaur Rahman Medical College Hospital (SZMCH) Bangladesh. SZMCH is a tertiary level hospital situated at Bogra district in northern part of Bangladesh. This hospital has various health care facilities among those, a busy maternity unit records about 300 deliveries per month. Postnatal mothers usually staying in postpartum ward 2-3 days after delivery. Being a referral hospital SZMCH handling many high risk pregnancies whose outcomes often include preterm birth those duration of hospital stay increasing up to week. This setting provided a good platform to study prevalence and related factors of preterm birth.

All postnatal mothers who delivered preterm baby were included in this study. The convenience sampling technique was used in this study. The sample size of this study was estimated by using G-power software program. The estimated sample

size was calculated for an accepted minimum level of significant (α) 0.05 and expected power 0.80(1-β) and effect size of 0.30(γ) estimated 82. After adding 18% attrition rate due to possible risk of dropout or missing data the total sample size was 100. Participants were selected by using purposive sampling technique based on inclusion and exclusion criteria. The inclusion criteria were preterm birth mother gestational age 28 to before completed 37 weeks, normal vaginal birth, willing to participate, psychologically wellbeing and the exclusion criteria was severe illness.

Instruments

The instrument in this study was face to face questionnaire developed by investigator based on literature review. Questionnaire has consisted of a total 27 items divided into 3 parts: (1) Socio-demographic characteristic questionnaire has 10 items, (2) Obstetric-gynecologic characteristic questionnaire has 12 items; and (3) Health status characteristic has 5 items which had taken 10-15 minutes to answer. The outcome variable preterm birth was measured by gestational age of delivery. This questionnaire was developed in English and translated into Bengali version based on back translation process 'English to Bengali to English' by two bilingual experts.

Data collection

Ethical clearance was obtained from Institutional Review Board (IRB), National Institute of Advanced Nursing Education and Research (NIANER). Permission was also taken from the hospital Director, Nursing superintendent. Written consent was taken from participants. Investigator had respected participants' autonomy and maintained their privacy, confidentiality and anonymity. Researcher assured their voluntary participation, free from harm and right to stop their participation in any time without any penalty.
Data were collected by the investigator through face to face interview in the period of December 2017 to February 2018 through 2 phases: Preparatory phase, and data collection phase.

Preparatory phase

The investigator has met and introduced her with hospital Director and Nursing Superintendent and explained the study purpose and asked for their cooperation. After obtaining their permission, investigator visited with nurse in charge in postpartum ward where postpartum mothers stayed after preterm delivery. Hospital staying for preterm mothers was usually 5-7 days.

After preparation phase, the investigator introduced her and explained the study purpose and asked for their voluntary participation. Among the willing participants, samples were recruited purposively based on inclusion criteria and taken written consent. Then investigator provided Bengali version questionnaire and collected data through face to face interview. During interview, investigator had made clear the items if participants asked to understand. After finishing the answer, the investigator has collected all filled questionnaires and check for making sure the absence of missing items. In this study, the response rate was cent percent. Information of filled questionnaire were entered in computer database.

Data analysis

Data were analyzed by using Statistical Package for Social Science (SPSS) version 19. Descriptive statistics frequencies, %, means and standard deviations were used to describe the postpartum mothers' demographic characteristics, obstetric and gynecological characteristics, and health status. Inferential statistics, two sample t-test, correlation and ANOVA was used to test difference between demographic variables and gestational age.

RESULTS

The study explored the factors related to preterm birth mothers and relationship between gestational age and socio-demographic characteristics; obstetrics-gynecology and health status characteristics of preterm birth mothers in Bangladesh

Socio demographic characteristic

The mean age 23.66 years (SD = 7.74). Most of the participants were muslim, married and housewives and percentages were 80%, 70% and 75% respectively. Approximately 70% participants were low income family and more than 40% of the participants have no formal education. All of the participants have no history of smoking cigarette (100%) and more than 40% of participants have family history of preterm birth. The mean of BMI = 25.44, SD = 5.42 (Table 1).

Obstetric-gynecologic characteristic

Near about 40% of the participants were second gravida and 35% of the participants have only one child. The mean gestational weeks of birth was 32.80 (SD =1.95) and interval between birth was 28.46 (45.18). Only 14% of the participants were one-two times attended at ANC visit and 26% participants were didn't attended ANC visit during this pregnancy period and more than 40% of the respondents have history of preterm birth in previous pregnancy. Nearly 70% of the participants have multiple pregnancy of last pregnancy and 47% of the subjects have previous adverse perinatal outcome. Among them abortion 29%, IUD 9% and still birth 9%. Near about 20% of the subjects were suffering from fibroid uterus and 50% of the participants don't know that she has suffering from fibroid uterus or not. More than 40% of the participants reported that they admitted in hospital during pregnancy period for different causes like bleeding (9%). HBP (3%), and others (30%). Among others cause of admission like convulsion, PROM, oligohydramnios and fever and 28% of the subjects have history of trauma during this pregnancy period (Table 2).

Table 1: Distribution of Socio-demographic Characteristics of Preterm Birth Mothers (N = 100)

Variables	Category	n (%)	M±SD
Age (Max – Min= 40-14)			23.66 ± 7.74
Religion	Muslim	80 (80.0)	
	Hindu	19 (19.0)	
	Christian	1 (1.0)	
Marital status	Married	70 (70.0)	
	Separated	30(30.0)	
Level of education	No formal education	41(41.0)	
	Primary school	21(21.0)	
	Secondary education	25(25.0)	
	College education	13(13.0)	
Occupation	House wife	75(75.0)	
	Service	11(11.0)	
	Labored	11(11.0)	
	Others	3(3.0)	
Monthly Family income(taka)	10000-15000/-	67(67.0)	
	>15000-20000/-	26(26.0)	
	>20000-25000/-	3(3.0)	
	>25000	4(4.0)	
Smoked a cigarette	No	100(100.0)	
Family history of preterm birth	No	56(56.0)	
	Yes	44(44.0)	
BMI (Max-Min =33.78-15.15)			25.44 ± 5.42
	Under weight	23(23.0)	
	Normal weight	13(13.0)	
	Over weight/Obese	64(64.0)	

Table 2: Distribution of obstetric-gynecologic characteristics of preterm birth mothers (N = 100)

Variables	Category	n(%)	M ± SD
Gravida	First	34(34.0)	
	Second	38(38.0)	
	Third	17(17.0)	
	Fourth or more	11(11.0)	
Para	None	48(48.0)	
	One	35(35.0)	
	Two	12(12.0)	
	Three	5(5.0)	
Gestational age (weeks) (Max-Min= 36-28)			32.80 ± 1.95
Births space (Months) (Max-Min=204-00)			28.46± 45.18
Ante natal checkup	Never	26(26.0)	
	One - Two times	39(39.0)	
	Three - Four times	21(21.0)	
	More than four times	14(14.0)	
H/O preterm birth	No	57(57.0)	
	Yes	43(43.0)	
Multiple pregnancy	No	67(67.0)	
	Yes	33(33.0)	
Previous adverse perinatal outcome	Abortion	29(29.0)	
	Intra-uterine death	9(9.0)	
	Stillbirth	9(9.0)	
	None	53(53.0)	
Suffering from fibroid uterus	No	31(31.0)	
	Yes	19(19.0)	
	Don't know	50(50.0)	
Hospital admission in antenatal period	No	58(58.0)	
	Yes	42(42.0)	
Causes of admission	Bleeding	9(9.0)	
	High blood pressure	3(3.0)	
	Others	30(30.0)	
Trauma during last pregnancy	No	72(72.0)	
	Yes	28(28.0)	

Health status characteristic

More than 20% of the subjects were suffering from anemia and 36% of the subjects didn`t know that she were suffering from anemia or not. 21% of the subjects were suffering from diabetes and 35% respondent didn`t know that she has suffering from diabetes or not. More than 40% of the participants have HTN and 30% didn`t know that she have HTN or not. 34% of the subjects burning sensation during urination throughout this pregnancy and 34% of the subjects didn`t know that she took iron supplement or not (Table 3).

Relationship between socio demographic, Obstetric gynecologic, Health status characteristics and Gestational age of preterm birth mothers is stated in Table 4.

The non-muslim participants had longer gestational age than muslim participants, but the result is statistically not significant. Even though

the result is not statistically significant, but the participant's those who are separated from husband were longer gestational age than the married participants those who live with husband. There is a significant relationship between occupation and gestational age where participants whose who housewife, they were shorter than those who are work outside (t = -2.42, p=.017) (Table 4).

Table 3: Distribution of health status characteristic of preterm birth mothers (N = 100)

Variables	Category	n (%)
Anemia	No	41(41.0)
	Yes	23(23.0)
	Don't know	36(36.0)
Diabetes	No	44(44.0)
	Yes	21(21.0)
	Don't know	35(35.0)
Hypertension	No	29(29.0)
	Yes	41(41.0)
	Don't know	30(30.0)
Burning sensation during urination	No	57(57.0)
	Yes	43 (43.0)
Taking iron supplement	No	42(42.0)
	Yes	24(24.0)
	Don't know	34(34.0)

Table 4: Relationship between socio-demographic characteristics and gestational age of preterm birth mothers (N = 100)

Variables	Category	Gestational age M ± SD	F/t/r	P value
Age			.010	.920
Religion	Muslim	32.72 ± 2.03	-.766	.445
	Non- Muslim	33.10 ± 1.61		
Marital status	Married	32.71 ± 1.91	-.668	.506
	Separated	33.00 ± 2.06		
Level of education	No education	32.73 ± 1.85	-.290	.772
	Education	32.84 ± 2.03		
Occupation	House wife	32.53 ± 1.97	-2.42	.017
	Work outside	33.60 ± 1.68		
Family income(taka)	10000-15000/-	32.80 ± 1.91	.486	.693
	>15000-20000/-	32.73 ± 1.95		
	>20000-25000/-	34.00 ± 1.00		
	>25000	32.25 ± 3.30		
Family history of preterm birth	No	32.46 ± 1.96	-1.96	.052
	Yes	32.97 ± 1.87		
BMI	Under weight	32.34 ± 2.08	.813	.447
	Normal weight	32.84 ± 2.33		
	Over weight/Obese	32.95 ± 1.82		

Table 5: Relationship between obstetric-gynecologic characteristics and gestational age of preterm birth mothers (N = 100)

Variables	Category	Gestational age	F/t/r	P value
		M ± SD		
Gravida	First	32.61 ± 1.80		
	Second	32.57 ± 2.27	.927	.431
	Third	33.35 ± 1.53		
	Fourthormore	33.27 ± 1.73		
Para	None	32.56 ± 1.96		
	One	32.94 ± 2.11		
	Two	33.25 ± 1.13	.521	.669
	Three	33.00 ± 2.44		
Births space (Months)			.073	.472
Antenatal checkup	Never	32.92 ± 2.01		
	One - Two times	32.33 ± 1.95	1.51	.217
	Three - Four times	33.04 ± 1.88		
	More than four times	33.50 ± 1.82		
Previous history of preterm birth	No	32.66 ± 1.95	-.784	.435
	Yes	32.97 ± 1.95		
Multiple pregnancy	No	32.68 ± 2.01	-.826	.411
	Yes	33.03 ± 1.82		
Previous adverse perinatal outcome	Abortion/IUD/stillbirth	33.14 ± 1.93	.884	.093
	None	32.49 ± 1.93		
Fibroid uterus	No	32.96 ± 2.22	.210	.811
	Yes	32.84 ± 1.83		
	Don't know	32.68 ± 1.84		
Hospital admission in antenatal period	No	32.72 ± 1.86	-.454	.651
	Yes	32.90 ± 2.09		
Causes of admission	Bleeding	32.55 ± 1.72	.326	.723
	High blood pressure	33.00 ± 1.73		
	Others	33.03 ± 2.17		
Trauma during pg.	No	32.77 ± 2.00	-.181	.856
	Yes	32.85 ± 1.84		

Table 6: Relationship between health characteristics and gestational age of preterm birth mothers (N = 100)

Variables	Categories	Gestational age	F/t	P value
		M ± SD		
Anemia	No	33.21 ± 1.90		
	Yes	32.52 ± 2.06	1.62	.203
	Don't know	32.50 ± 1.90		
Diabetes	No	32.75 ± 1.97		
	Yes	33.57 ± 1.80	2.45	.091
	Don't know	32.40 ± 1.92		
Hypertension	No	32.31 ± 2.12		
	Yes	33.31 ± 1.73	2.64	.076
	Don't know	32.56 ± 1.95		
Burning sensation	No	32.40 ± 1.79	-2.39	.019
	Yes	33.32 ± 2.05		
Taking iron supplement	No	33.09 ± 2.03		
	Yes	32.45 ± 1.99	.913	.405
	Don't know	32.67 ± 1.82		

Although this findings is not statistically significant, but those participants had previously adverse perinatal outcome, they were longer gestational age (t = .884, p = .093) (Table 5). Mother who had burning sensation during urination (t = -239, p = .019) were significantly higher gestational age (Table 6).

DISCUSSIONS

The problem of preterm births (PTB) is a multidimensional public health concern affecting not only maternal and child health but also reflects on the society. Preterm delivery is the chief problem in obstetrics today.

Socio-demographic characteristics

It was found that the age of the mothers ranged from 14-40 years with mean age 23.66 years (SD =7.74). Most of the mother's religion was muslim. In this study muslim mothers were 80%, hindu 19% and Christian 1%. These findings revealed that among the respondents 30% were separated (stay without husband) and 70% respondents were married (stay with husband).

The current study revealed that maximum participants have no formal education. On the other hand the study by Kaewluang (2015) women who had higher levels of education had increased gestational age at birth whereas women of low educational attainment were more likely to have preterm birth. Education is an indicator of socio-economic status of a person. The socio-economic status as well as maternal education influence one's ability to access and use health care. Limited access to health care can cause preterm birth. Similar study observed that education is the dimension of socioeconomic status which most strongly and consistently predicts health status. A low level of education limits a person's access to employment and other social resources, which in turn limits her capacity to integrate within society and thereby increases the risk of subsequent poverty (Shah et al., 2014).

The present study revealed that most of the women's (75%) occupation were housewives followed by labor (11%) and 3% maidservant.

The socio-economic conditions of the women varied according to their income of the family. It is observed that most of the participants had low monthly family income (67%) between1000-15000/-. Similar study was reported by Bekele et al. (2015) who found significant association between income and preterm birth. Mothers who have family income <600 birr/month (<15 USD/month) are 2.6 times more likely to have preterm birth than mothers who had income ≥ 600 birr/month (≥ 15 USD/month). However smoking a cigarette is one of the factor of preterm birth of developed country, but the society of our country perspective the women's don't smoked a cigarette and this study proved that 100% respondent were none smoker. As we know some diseases occur genetically from one generation to another generation. As we know some diseases occur genetically from one generation to another generation. Similarly that those who have family history of preterm birth of mothers they are more vulnerable to occur the preterm birth. In this study more than 40% respondents have family history of preterm birth.

Obstetrics-gynecological characteristics

Gestational age means preterm or term birth. Birth after 28 to before 37 completed weeks of gestation is called preterm birth. Termination before 28 weeks of gestation is called abortion and after 37 completed weeks called term birth. The mean of gestational age is 32.80 week and standard deviation 1.9. These findings revealed that 26% participants never attended to ante natal checkup (ANC), 39% participants were one-two times and only 21% participants were three-four times attended to ante natal checkup. Similar study was done by Shah et al. (2014) in developing countries, who found that "no ANC visit" was a significant risk factor for preterm birth, ranging from 1.3 times to 7 times higher than women with ANC visit. Visits to ANC centers and/or receiving ANC may raise awareness for skilled delivery care or give women and their families familiarity with the health services available at health centers. Thus enabling them to navigate and receive necessary care when a crisis arises.

In this study, about 26% of respondents didn't attend ANC at all. Antenatal care visit is one of

most effective interventions in avoiding adverse pregnancy outcomes. When it is sought early in the pregnancy it is possible to detect reproductive health risk factors. This increases the likelihood of pre-term birth. Similar findings have been reported by Mahapula et al. (2016) where attendance to public prenatal care unit was found to be protective factor against pre-term birth.

The present study identified that women who had a previous history of preterm birth was more than 40% at risk of another preterm birth. This study is in accordance with the study of Kaewluang (2015) who stated that previous preterm birth is major risk factor for preterm birth. Murad et al. (2017) found that 38% had not history of preterm birth previously whereas 62% had previously history for preterm birth In the present study multiple pregnancies was one third of the total participants. In a study the relationship between multiple pregnancy and preterm labor was found to be significant, which is consistent with the result of Tehranian et al (2016).

Fibroid uterus may leads to preterm birth whereas 50% of participants didn't know that she has suffering from fibroid uterus or not while 20% participants had suffering from fibroid uterus observed in this study. More than 40% of the respondents reported that they were admitted in hospital for underlying causes; bleeding 9%, high blood pressure 3% and others 30%. Among 30% others causes of admission consist of convulsion 9%, PROM 14%, oligohydramnios 5% and fever 1%.

The study revealed that 28% of participants have history of trauma during pregnancy in different ways. Maximum participants told that they were violent from others and fall down, someone had road traffic accident during pregnancy.

Health status characteristics

These findings revealed that 23% of respondent were anemic and 36% participants didn't know that she had been suffering from anemia or not. On the other hand maternal morbidity, especially anemia was associated with the development of PTBs (Preterm births) because it interferes with intra-uterine fetal growth. The same result may be obtained if blood supply of the fetus was interfered by any cause of hemorrhage or hypertension. Common reasons contributing to preterm births include anemia, pre-eclampsia or eclampsia (Abdel Hady & Abdel Wahid, 2015).

In the study, more than 20% women had diabetes. One study reported that mothers with gestational diabetes had an increased risk of spontaneous preterm birth (Kaewluang, 2015). The present study found that gestational hypertension was more than 40% which is in accordance with the study of Kaewluang (2015).

The bivariate analysis results of this study revealed that women who had education and worked outside their gestational age increased compared to those stay at home (housewives) because of their active movement, healthy, conscious and close medical attention. These observed is supported by a Japanese study where part-time workers delivered preterm babies more frequently than full-time workers (Abdel Hady & Abdel Wahid, 2015).

CONCLUSION

Preterm birth is a leading cause of neonatal and infant mortality as well as short- and long- term disability. Identifying pregnant women at the risk of preterm delivery and proving quality healthcare, community health education and awareness campaigns may decrease the rate of preterm birth and its consequences. In this studies housewife might have worse health conditions, which can affect to gestational age, and women who had burning sensation during urination might have close medical attention which could came longer gestational age.

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CONFLICT OF INTEREST

There is no conflict of interest.

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