Systematic Review on Factors Associated with Female Age at Marriage

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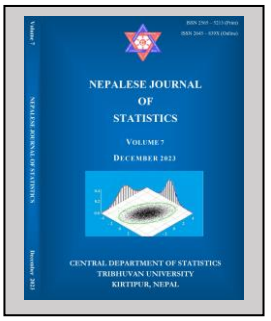

ABSTRACT

Background: Female age at marriage is one of the major indicators of population dynamics associated with age at which marriable couples are united and simultaneously acts of giving new childbirth with new family roles. Occurrence of marriage before the body being physically fit and mentally matured results in many adverse consequences. However, less attentions have been given to the variability of female age at marriage which can be influenced by different factors.

Objective: This review paper is an attempt to explore significant factors associated with female age at marriage, and to mark those factors as explained by model-based statistical effect size.

Materials and Methods: Following the PRISMA-Preferred Reporting Items for Systematic Review and Meta-Analysis guideline, three databases EMBASE, PubMed and Scopus were used to identify relevant articles combining key search terms using Boolean operations. From these databases, a total of 605 eligible articles originally published in English language till the date of 20 November, 2023 were identified. Applying the inclusion and exclusion criteria only 17 papers which had used statistical models were ascertained for final review.

Results: The effect size which was found significant at 0.05 level of significance explored that female's education, place of residence, religion, caste/ethnicity, birth cohort, current age, female's work status, type of occupation, wealth index, husband's education are the major determinants, which are observed to be significantly associated with female age at marriage.

Conclusion: Female age at marriage is found to be varied from place to place, region to region and country to country. As the level of education increased, the possibility of acquiring early age at marriage has been reduced significantly. The demographic, socio-economic, gender and community factors played significant roles at the timing of females age at marriages. Moreover, female age at marriage has a considerable impact on fertility measures and population structure. Hence, policy relating to improving female age at marriage and its associated effective enforcement of law are required to meet the SDGs targets.

Keywords: Age at marriage, determinants, PRISMA, systematic review.

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INTRODUCTION

Marriage can be considered both the formal and informal unions in which individuals live with partner. It could either be formally registered or cohabitation or other kinds of reasonably established relationships, to varying degrees of individuals, social acceptance and the ways of family formation around the world (Rhoades et al., 2009). Female's age at first marriage believe to be inversely related to the number of children ever born (Shrestha & Shrestha, 2008), and is one of the leading determinants of population dynamics, associated with age at which marriable couples are united and simultaneously acts of giving new childbirth with new family roles. Female age at marriage are influenced by number of different factors both at family and societal level (Dixon, 1971) which varies due to many reasons. Female's education (Abalos, 2014; Islam et al., 2013), place of residence (Caltabiano & Castiglioni, 2008; Jayaraman et al., 2009; Kamal, 2011), religion (Pazvakawambwa et al., 2013), ethnicity (Misunas et al., 2021), birth cohort (Rasul et al., 2022), female's work status (Kamal, 2011; Rasul et al., 2022), family economic status (Aryal, 2007; Pazvakawambwa et al., 2013), husband education (Caltabiano & Castiglioni, 2008; Kamal, 2011), father's education (Aryal, 2007; Kamal, 2011), female's age at menarche (Aryal, 2007) and premarital sex (Misunas et al., 2021) have been observed as some of the significant determinants associated with female age at marriage. The role of female's education is shown to be one of the major influential factors to determine their marrying age, since staying in school till to the higher level of educational attainment is expected to get delayed marriage (Glick et al., 2015). Preventing marriage in early age results for more females that they achieve higher level of education, and is associated with marital stability and control of an unintended pregnancy. On the other hand, risk of early marriage, marrying before the age of 18, as defined by the 1979 Convention on the "Elimination of All Forms of Discrimination Against Women" and the 1990 "African Charter on the Rights and Welfare of the Child" with the definition of the "Convention on the Rights of the Child" still in existence in many low-income and lower-middle income economic countries (Jensen & Thornton, 2003). Female age at early marriage is not only linked with demographic structural changes but also one of the major causes of maternal-child mortality and morbidity in many developing countries of Asia and Africa where the practice of early marriage remain widespread (Solanke, 2015). The connection between female age at marriage and the dimensions of socioeconomic development - urbanization, female participation in labor force, gender equality, parent's support for girl's career development believed to be an important reason for females to enter into delayed age at marriage (Singh & Samara, 1996). Females, who grew up in rural places do have the evidences of less educational attainment and poor socio-economic status that prevail them to fall into gender discrimination, violence and stigma (Singh, 1992), and also not been able to take self-decision about their own life.

In order to prevent unintended age at female first marriage there is need to intervene programs like education to all (SDG-4) and gender equality (SDG-5) as indicated by Sustainable Development Goals (SDGs). Over the past few decades female's age at first marriage and socio-economic changes have occurred parallel in many developing economics. The improved social indicators positively impacted in the control of early marriage and early childbearing (Abdullah et al., 2021). On the other hand, increasing autonomy of mate selection of young adult is a major factor to set the time of their age at marriage, however, socio-economic differentials and determinant found to be prevailed in determining the age at marriage (Aryal, 1991). In most of the South Asian countries, marriage decision is still controlled by parents irrespective of female's education even there is a positive association between education and age at marriage (Hussain & Bittles, 1999). The research papers published by Isiugo-Abanihe et al. (1993) and Islam et al. (2013) indicated that female's higher level of education, employment opportunity and empowerment lead to support females for delay marriages. Hence, improving female's school enrolment, employment opportunity and empowerment positively impact to control their early age at marriage, unwanted pregnancy as well as maternal-child mortality. Different studies have reported different factors associated with female age at marriage. The factors vary from country to country, place to place and study to study. It is very difficult to know the important factors associated with female age at marriage without performing systematic studies. The primary studies without capturing the considerable factors associated with the female age at marriage may become inadequate for both research and policy point of view. With the best of our knowledge and extensive review of previous literatures not any comprehensive systematic review studies to identify the factors associated with the female age at marriage was identified. This study is an attempt to identify the most important factors associated with female age at marriage through the systematic review.

METHODOLOGY

Data source and search strategy

This review paper used systematic and explicit methods to identify the published articles available in different database. PRISMA - Preferred Reporting Items for Systematic Review and Meta-Analysis (Page et al., 2021) guidelines were followed to conduct the study. Using Boolean operation "OR" and "AND" a well-constructed key search term was developed to retrieve all relevant published journals to meet the objective of the study. The search strategy: [("factor* associated" OR "factor* affect*" OR "determinant*" OR "differential*") AND ("female* age at first marriage" OR "age at first marriage" OR "age at marriage")] was tested multiple times separately in EMBASE, PubMed and Scopus. The search process applied in EMBASE and Scopus was limited in title, abstract and keywords, but for the PubMed, it was limited in title and abstract. Every time each database had captured the same results published up to 20 November, 2023.

Study selection

Zotero (www.zotero.org), an open-source reference manager software (Courraud, 2014) was used to manage all the search records captured from these different databases. Duplicate records identified in the sources were merged in a single record. Remaining records after removing

the duplicate were exported to Research Information System (RIS) format and imported to Rayyan (rayyan.ai), a web-based application used in systematic review (Wolverton, Jr. & Davidson, 2018). The titles and abstract screening were effectively and quickly managed in Rayyan with the involvement of both authors. The screened records were managed in Rayyan by applying green color tags for included records and red color tags for excluded records. All the included records in Rayyan were exported to authors personal mail ID and again imported into Zotero for its full text download and final assessment.

Inclusion and exclusion criteria

Studies originally written in English language, original research papers matching to the study objective, the research articles based on both cross-sectional and cohort study design, peer-reviewed journals, published till the date of November 20, 2023 were included for the review. Studies in which full text were not available, not matched with the study objective, not using statistical model, dealing only descriptive measures, discussion and qualitative analysis were excluded. The detail records of excluded papers were presented in PRISMA flowchart in fig 1.

Data extraction

Eligible papers were rigorously assessed to capture relevant information. Discrepancies in the process of extracting information were removed through the discussion and common understanding of both authors. Both the authors thoroughly assessed each included record and extracted the relevant information and verified the extracted information to reduce selection bias and minimize individual error. Microsoft excel sheet was used to arrange all information extracted from the study. The study characteristics included in this review paper is presented in table I namely includes (i) authors and study period (ii) study title (iii) country of study (iv) study design (v) sample size/data source (vi) statistical model (vii) mean/median age at marriage (viii) significant factors associated with female age at marriage. If the reviewed paper has reported the results based on different waves of time separately in a single paper, it has been attempted to consider only the reports based on relatively the latest wave of time.

Quality assessment

AXIS - Appraisal tool for Cross-Sectional Studies (Ma et al., 2020) was used to examine the quality of all included studies. The quality of each study was independently ranked by both authors. The differences marked in the course of appraisal were resolved with the agreement of both authors. More than 84.1% evaluation tools included in AXIS were explained by the included papers. The aims/objectives, study design and target population of all 100% studies were clearly specified in each study. At least 12 (70.6%) studies had strongly justified sample frame and sample size likely to select representative subjects or participants of the target population. All studies (100%) measured the risk factor and outcome variables appropriately to the aims of the study by using appropriate statistical significance and/or precision estimates (e.g., p-values, HR, OR, TR, CIs. etc.). The methods and models used in the studies had described to enable them to be reproducible

for at least 12 (70.6%) papers, however, some other sources of biases including selection of methodology and measurement may affect.

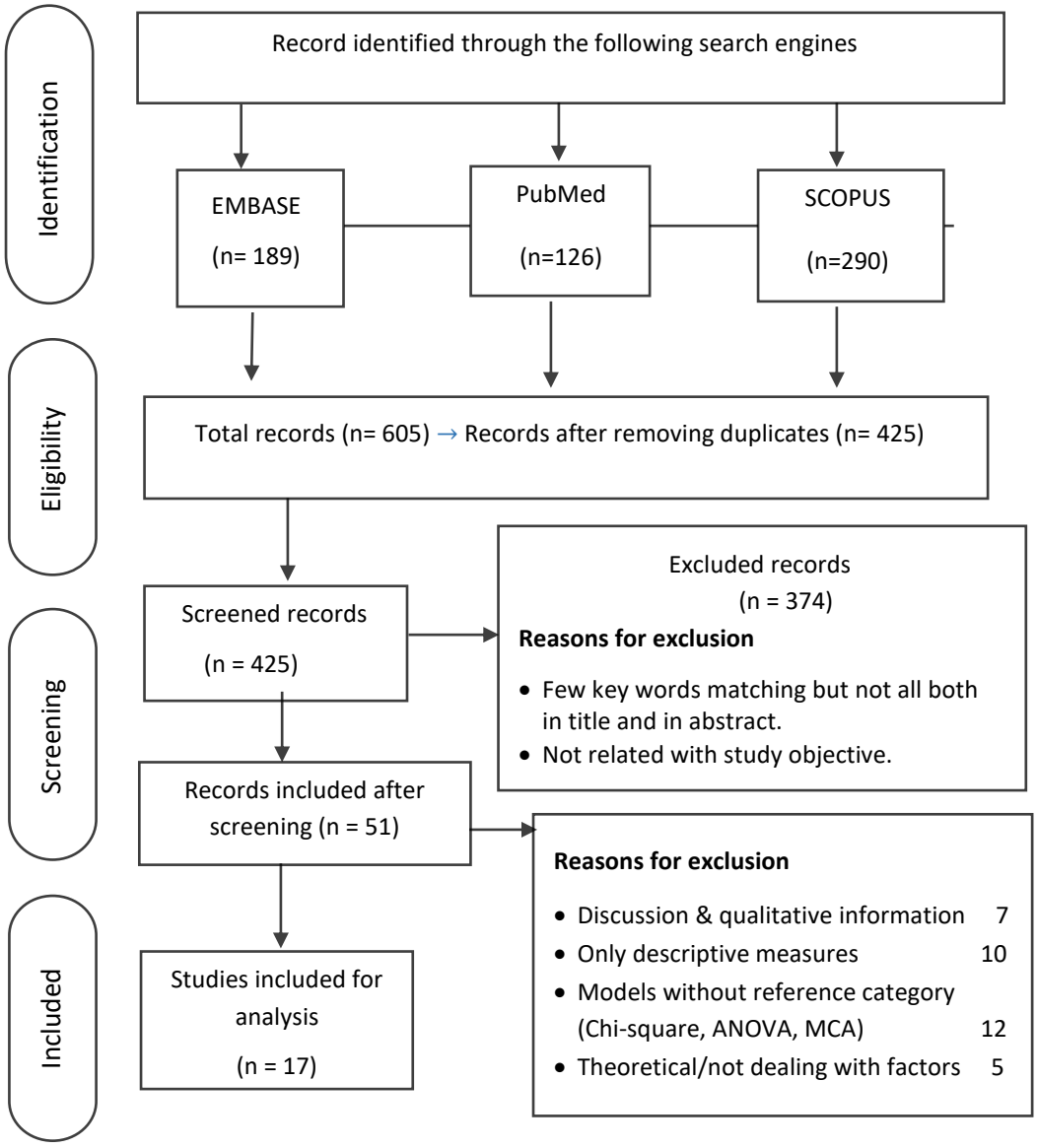

Fig. 1. PRISMA flow diagram for the selection of studies.

Non-response bias was the most prevalent concern in the results for at least 4 (23.5%) papers. Remaining 13 (76.5%) articles based on cross-sectional study using Demographic and Health Survey (DHS) or other nationally representative survey often do not report the information about non-response in their papers. However, there should not be the question of the quality of DHS

data and other nationally representative surveys, since those surveys have been done by recognized research institutions. The findings and results of all 17(100%) papers were analyzed by using the methods described in the papers, and were internally consistent including the discussion and conclusion parts. Limitation and the potential influence of the bias on their estimates or results due to methodological selection and the measurements were discussed more than 41.2% of the reviewed papers. In regard to the funding source and conflict of interest most of the papers were either silence (58.8%) or did not disclose (17.6%) these issues. The ethical approval or consents of participants were found to be attained by all 100% papers. Almost all criteria as indicated by AXIS has been reasonably satisfied by the included papers. The list of assessment ranked done in the AXIS domain of each study has maintained in the excel file.

Registration of systematic review

This study has been registered in an international database, and received the international prospective register of systematic reviews with the PROSPERO number: CRD42023401276. The registration is available on *https://www.crd.york.ac.uk/PROSPERO/#searchadvanced*.

Synthesis of the results

All extracted records were synthesized to present the detail descriptive summary of the results and presented in table 1. It contains different components of the studies, including authors & study period, study title, study country, design of study, size of sample/source, and the study findings. Factors/determinants associated with female age at first marriage were the major findings assessed by different statistical measures using effect size (regression coefficients, odds ratio, hazards ratio, time ratio, estimates based on Bayesian approach) and p-value.

Table.1 Studies characteristics (n = 17).

Authors & study period	Study title	Country	Study design	Sample size (Data source)	Statistical model	Mean (Median) AAM
(Abalos, 2014)	Trends and Determinants of Age at Union of Men and Women in the Philippines	Philippines	Cross-Sectional	13594 (DHS 2008)	Cox PH	24.4
Significant Factors associated with female age at marriage	**Female education:** secondary with Ref primary and lower (HR = 0.78, p-value < 0.001), above secondary (HR = 0.40, p-value < 0.001); **Ethnicity:** Ilocana with Ref Tagalog (HR = 1.20, p-value < 0.001), Other group (HR = 1.17, p-value < 0.01); **Birth cohort:** 1979-1993 with Ref 1958-1968 (HR = 1.08, p-value < 0.05)					

(Alazbih et al., 2023)	Determinants of time to first marriage and birth intervals among women of child bearing age in Dabat Health and demographic surveillance system site, Northwest Ethiopia	Ethiopia	Cross-Sectional	1683 (Field Survey	Log-Logistic Regression	(15)
Significant Factors associated with female age at marriage	**Current age**: 25-34 with Ref 35+ (TR = 1.05, CI = 1.02 – 1.10, p-value < 0.01), 15 -24 (TR = 1.12, CI = 1.06 – 1.18, p-value < 0.001); **Female education:** primary with Ref to none (TR = 1.05, CI = 1.0 – 1.10, p-value < 0.05), secondary+ (TR = 1.21, CI = 1.14 – 1.28, p-value < 0.001); **Occupation:** student with Ref housewife (TR = 1.53, CI = 1.43 – 1.64, p-value < 0.001), employed (TR = 1.23, CI = 1.15 – 1.33, p-value < 0.001), job seekers (TR = 1.32, CI = 1.23 – 1.43, p-value < 0.001); **Ideal children:** <=4 with Ref 5+ (TR = 1.06, CI = 1.03 – 1.10, p-value < 0.01); **Wealth index:** lowest with Ref middle (TR = 1.12, CI = 1.07 – 1.18, p-value < 0.001).					
(Amoo, 2017)	Trends and determinants of female age at first marriage in Sub-Saharan Africa (1990-2014): What has changed?	3 countries in Sub-Saharan Africa; Ghana, Kenya, Zambia	Cross-Sectional	32712 (DHS 2010-2014)	Cox PH	(17.0)
Significant Factors associated with female age at marriage	**Female education:** primary with Ref no education (HR = 0.9076, p-value < 0.001, 95%C.I = 0.88 - 0.93), secondary (HR = 0.5134, p-value < 0.001, 95%CI = 0.50 - 0.53), tertiary (HR = 0.3599, p-value < 0.001, CI = 0.34 - 0.37); **Religion:** Islam with Ref Christianity (HR = 0.7313, p-value < 0.001, 95%CI = 0.69 - 0.76), others (HR = 0.0.7364, p-value < 0.001, 95%CI = 0.64 - 0.85); **Wealth status:** moderate with Ref poor(HR = 0.9437, p-value < 0.001, 95%CI = 0.92 - 0.97), rich (HR = 0.8667, p-value < 0.001, 95%CI = 0.84 - 0.89); **Females occupation:** sales/services with Ref unemployed (HR = 1.1820, p-value < 0.001, 95%CI = 1.13 - 1.24), farming (HR = 1.0832, p-value < 0.001, 95%CI = 1.04 - 1.13), professional (HR = 1.0559, p-value < 0.040, 95%CI = 1.00 - 1.11); **Residence:** rural with Ref urban (HR = 1.0814, p-value < 0.001, 95%CI =1.06 - 1.11)					
(Aryal, 2007)	Age at First Marriage in Nepal: Differentials and Determinants	Nepal	Cross-Sectional	1566 (Field Survey)	Cox PH	(18.0)

Significant Factors associated with female age at marriage	**Social status:** higher with Ref low (HR = 1.3656, p-value = 0.0001); **Economic status:** higher with Ref low (HR = 1.5188, p-value = 0.0000); **Females education:** primary with Ref none (HR = 0.7900, p-value = 0.0096), secondary & higher (HR = 0.6599, p-value = 0.0001); **Father's education:** primary with Ref none (HR = 0.8337, p-value=0.0162), lower secondary (HR = 0.6323, p-value = 0.0014), secondary & higher (HR = 0.6158, p-value = 0.0000); **Female's occupation:** service with Ref household work (HR = 0.5664, p-value = 0.0.0170), **Ethnicity:** Gurung/Magar with Ref Brahmin (HR = 0.6312, p-value = 0.0001), Kami/Damain (HR = 0.7451, p-value = 0.0130), Newar (HR = 0.7180, p-value = 0.0553); **Female's age at menarche:** 17+ with Ref <13 (HR = 0.5641 p-value = 0.0005); **Year-of-birth cohort:** 1965-1969 with Ref Before 1965 (HR = 0.7637, p-value = 0.0080), 1970-1974 (HR = 0.7359, p-value = 0.0032), 1975-1980 (HR = 0.6664, p-value = 0.0001)					
(Caltabiano & Castiglioni, 2008)	Changing Family Formation in Nepal: Marriage, Cohabitation and First Sexual Intercourse	Nepal	Cross-Sectional	7732 (DHS 2001)	Logistic Regression	15.6
Significant Factors associated with female age at marriage	**Female education:** primary with Ref none (OR = 0.84, p-value < 0.01), secondary (OR = 0.61, p-value < 0.01), higher (OR = 0.25, p-value < 0.01); **Husband's level of education:** >= secondary with Ref <= primary (OR = 0.89, p-value < 0.05); **Age difference between spouses:** wife 0-2 years younger with Ref wife >= 3years younger (OR = 0.84, p-value < 0.01), wife older (OR = 0.50, p-value < 0.01); **Childhood residence:** city with Ref countryside (OR = 0.69, p-value < 0.05); **Current residence/(Region of residence)**: Eastern Mountain with Ref Central Hill: Kathmandu area (OR = 0.38, p-value <0.01), Central Mountain (OR = 0.82, p-value < 0.05), Eastern Hill (OR = 0.59, p-value < 0.01), Western Hill (OR = 0.71, p-value <0.01), Western Terai (OR = 0.67, p-value <0.01); **Ethnicity:** Hill-Chhetri/Sanyashi/Thakuri with Ref Hill-Brahman (OR = 1.18, p-value < 0.05), Terai-Musalman (OR = 1.49, p-value < 0.01), Terai-Tharu/Danuwar, Dhimal/Majhi, Rajbanshi (OR = 0.72, p-value <0.01), Tarai-Advantaged (OR = 1.66, p-value < 0.05), Terai-Others (OR = 0.76, p-value <0.01)					
(Gayawan & Adebayo, 2014)	Spatial Pattern and Determinants of Age at Marriage in Nigeria Using a Geo-Additive Survival Model	Nigeria	Cross-Sectional	34070 (DHS 2008)	Geo-additive Hazard Model	(18.3)

Significant Factors associated with female age at marriage	**Birth cohort (Trend):** 2003 with Ref 1999 (Mean = -0.065, S.E = 0.014, 95% Credible interval = -0.093 - -0.036), 2008 (Mean = 0.089, S.E = 0.011, 95% Credible interval = 0.067 – 0.112); **Residence:** urban with Ref rural (Mean = -0.079, S.E = 0.010, 95% Credible interval = -0.098 - -0.060); **Female education:** primary with Ref no education (Mean = 0.295, S.E = 0.011, 95% Credible interval = 0.273 – 0.317), secondary (Mean = -0.188, S.E = 0.0.012, 95% Credible interval = -0.209 - -0.165), higher (Mean = -0.607, S.E = 0.019, 95% Credible interval = -0.645 - -0.568); **Religion:** Catholic with Ref none/traditional (Mean = -0.151, S.E = 0.019, 95% Credible interval = -0.189 - -0.114), other Christians (Mean = -0.116, SE = 0.015, 95% Credible interval = -0.144 - -0.085), Muslims (Mean = 0.198, S.E = 0.017, 95% Credible interval = 0.165 – 0.232), **Ethnicity:** Hausa with Ref other ethnic (Mean = 0.100, S.E = 0.020, 95% Credible interval = 0.060 – 0.138), Yoruba (Mean = -0.129, S.E = 0.024, 95% Credible interval = -0.175 - -0.079)					
(Islam et al., 2013)	The Pattern of Female Nuptiality in Oman	Oman	Cross-Sectional	2037 (NHS 2000)	Logistic regression	16.1
Significant Factors associated with female age at marriage	**Place of residence:** urban with Ref rural (OR = 0.695, Coef. (β) = -0.116, SE of Coef. = 0.13, p-value = 0.012); **Region of residence:** Dhofar with Ref Al-Dhahirah (OR = 2.496, Coef. (β) = 0.915, SE of Coef. = 0.290, p-value = 0.001), Al-Shrqiah (OR = 1.940, Coef. (β) = 0.662, SE of Coef. = 0.292, p-value = 0.015); **Female educational:** primary/preparatory with Ref no education (OR = 0.702, Coef. (β) = -0.354, SE of Coef. = 0.166, p-value = 0.014), secondary or higher (OR = 0.571, Coef. (β) = -0.561, SE of Coef. = 0.185, p-value = 0.001); **Work status:** not working for remuneration with Ref work for remuneration OR = 0.771, Coef. (β) = -0.260, SE of Coef. = 0.195, p-value = 0.015); **Type of marriage:** non-consanguineous with Ref consanguineous (OR = 0.627, Coef. (β) = -0.467, SE of Coef. = 0.126, p-value = 0.000)					
(Islam & Mahmud, 1996)	Marriage Patterns and Some Issues Related to Adolescent Marriage in Bangladesh	Bangladesh	Cross-Sectional	11906 (BFS 1989)	Logistic Regression	14.8
Significant Factors associated with female age at marriage	**Female education:** primary with Ref higher (OR = 2.9, Coef. (β) = 1.061, SE of Coef. = 0.161, p-value < 0 .01), no school (OR = 2.8, Coef. (β) = 1.040, SE of Coef. = 0.165, p-value < 0.01); **Husband's occupation:** land owners/cultivators/professional, sales/services, production with Ref labourers/farmers (OR = 1.2, Coef. (β) = 0.124, SE of Coef. = 0.162, p-value < 0 .05), workers (OR = 0.7, Coef. (β) = - 0.310, SE of Coef. = 0.149, p-value < 0 .05); **Region of residence:** Dhaka with Ref Chittagong (OR = 1.3, Coef. (β) = 0.277, SE of Coef. = 0.137, p-value < 0 .05), Khulna (OR = 1.6, Coef. (β) = 0.489, SE of Coef. = 0.164, p-value < 0 .05); **Childhood residence:** rural with Ref urban (OR					

	= 1.6, Coef. (β) = 0.476, SE of Coef. = 0.162, p-value < 0 .01); **Female's work status:** no with Ref yes (OR = 1.4, Coef. (β) = 0.346, SE of Coef. = 0.139, p-value < 0 .05); **Husband's education:** primary with Ref higher (OR = 1.4, Coef. (β) = 0.340, SE of Coef. = 0.164, p-value < 0 .05), no school (OR = 1.5, Coef. (β) = 0.437, SE of Coef. = 0.157, p-value < 0 .05)					
(Jayaraman et al., 2009)	Effect of Conflict on Age at Marriage and Age at First Birth in Rwanda	Rwanda	Cross-Sectional	11321 (DHS)	Cox PH	20.1
Significant Factors associated with female age at marriage	**Location grew up/(Childhood residence):** countryside with Ref city (HR = 1.26, p-value < 0.01); **Religion:** Protestant with Ref Catholic (HR = 1.12, p-value < 0.01), Adventist (HR = 1.10, p-value < 0.05), Muslim (HR = 1.46, p-value < 0.01); **Female education:** up to primary with Ref no education (HR = 0.82, p-value < 0.01), post primary (HR = 0.50, p-value < 0.05); **Age cohort:** 15-24 with Ref 35-49 (HR = 0.51, p-value < 0.01), 25-34 (HR = 0.90, p-value = 0.01)					
(Kamal, 2011)	Socio-Economic Determinants of Age at First Marriage of The Ethnic Tribal Women in Bangladesh	Bangladesh	Cross-Sectional	792 (Field Survey)	Cox PH	18.9
Significant Factors associated with female age at marriage	**Tribal identity:** Tripura with Ref Chakma (HR = 1.27, p-value < 0.001, 95%CI = 1.04 –1. 57); **Birth cohort:** 1971-1980 with Ref 1957-1960 (HR = 0.59, p-value < 0.05, 95%CI = 0.37 – 0.94); **Female education:** secondary or above with Ref illiterate (HR = 0.61, p-value < 0.001, 95%CI = 0.46 – 0.82); **Work status:** employed with Ref unemployed (HR = 0.73, p-value < 0.05, 95%CI = 0.51 – 1. 05); **Childhood residence:** urban with Ref rural (HR = 0.63, p-value < 0.001, 95%CI = 0.48 – 0.83); **Father's education:** literate with Ref illiterate (HR = 0.76, p-value < 0.05, 95%CI = 0.53 – 1. 08); **Father's survival status:** living to not alive (HR = 0.67, p-value < 0.001, 95%CI = 0.56 – 0.80); **Food security:** occasional deficit with Ref always deficit (HR = 0.58, p-value < 0.001, 95%CI = 0.46 – 0.73), balance/surplus (HR = 0.46, p-value < 0.001, 95%CI = 0.35 – 0.59); **Birth order:** second with Ref first (HR = 0.83, p-value < 0.05, 95%CI = 0.68 – 1. 01), third (HR= 0.67, p-value < 0.001, 95%CI = 0.52 – 0.85), fourth or higher (HR = 0.51, p-value < 0.001, 95%CI = 0.39 – 0.67)					
(Lai, 2021)	The Changing Educational Gradient in Marriage: Evidence from Malaysia	Malaysia	Cross-Sectional	26710 (LFS 2009)	Binary Logistic Regression	25.7

Significant Factors associated with female age at marriage	**Female education:** secondary with Ref none/primary (AOR = 0.63, 95%CI. = 0.62 – 0.63, M.E. = -0.06, p-value < 0.001), tertiary AOR = 1.20, 95%CI. = 1.19 – 1.21, M.E. = 0.02, p-value < 0.001)					
(Manda & Meyer, 2005)	Age at first marriage in Malawi: a Bayesian multilevel analysis using a discrete time-to-event model	Malawi	Cross-Sectional	13220 (DHS 2000)	Hierarchical discrete-time survival model	17.5 (17.9)
Significant Factors associated with female age at marriage	**Birth cohort:** 1976-1980 with Ref 1981-1985 (Mean = 1.655, SD =0.076, 95%Credible interval = 1.512 – 1.813), 1971-1975 (Mean = 1.692, SD =0.081, 95%Credible interval = 1.539 – 1.851), 1966-1970 (Mean = 1.6708, SD =0.092, 95%Credible interval = 1.533 – 1.894), 1961-1965 (Mean = 1.580, SD =0.087, 95%Credible interval = 1.412 – 1.762), 1956-1960 (Mean = 1.715, SD =0.106, 95%Credible interval = 1.516 – 1.936), 1951-1955 (Mean = 1.311, SD =0.083, 95%Credible interval = 1.161 – 1.1472); **Residence:** rural with Ref urban (Mean = 1.021, SD =0.042, 95%Credible interval = 10.940 – 1.098); **Region:** central with Ref northern (Mean = 0.747, SD =0.036, 95%Credible interval = 0.678 – 0.818), southern (Mean = 0.920, SD =0.029, 95%Credible interval = 0.837 – 1.007); **Education:** no education with Ref primary education (Mean = 4.065, SD = 0.251, 95%Credible interval = 3.585 – 4.573), primary education (Mean = 3.781, SD = 0.196, 95%Credible interval = 3.376 – 4.175)					
(Misunas et al., 2021)	What Influences Girls' Age at Marriage in Burkina Faso and Tanzania? Exploring the Contribution of Individual, Household, and Community Level Factors	Burkina Faso	Cross-Sectional	1010 (Field study)	Logistic regression models	NA
		Significant Factors associated with female age at marriage	**Religion:** Other with Ref Muslim (OR = 0.53, p-value < 0.05); **Female education:** primary with Ref none (OR = 0.34, p-value < 0.001), secondary or higher (OR = 0.05, p-value < 0.001); **Premarital sex before the age of 15:** yes with Ref no (OR = 2.16, p-value < 0.05); **Parents supportive view to her education:** Yes with Ref no (OR = 0.49, p-value < 0.01); **Parent support to girl's future aspiration:** yes with Ref no (OR = 0.64, p-value < 0.05); **Gil's lack of mobility:** yes with Ref no (OR = 1.68, p-value < 0.05); **Girls lacks decision about**				

						marriage: girls choice with Ref parent want (OR = 2.75, p-value < 0.001); **Mother's higher education:** yes with Ref no (OR = 0.25, p-value < 0.01); **Fathers support for girls to marry >= 18 years:** yes with Ref no (OR = 0.56, p-value < 0.01); **Gender equitable views among parents:** yes with Ref no (OR = 2.58 p-value < 0.05)
			Tanzania	Cross-Sectional	823 (Field survey)	Logistic regression models	NA	
		Significant Factors associated with female age at marriage						**Ethnicity:** Sukuma with Ref Nyamwezi (OR = 2.04, p-value < 0.01); **Female education:** primary with Ref none (OR = 0.36, p-value < 0.001), secondary or higher (OR = 0.04, p-value < 0.001); **Premarital sex before the age of 15:** yes with Ref no (OR = 2.50, p-value < 0.001); **Parents supportive view to her education:** Yes with Ref no (OR = 0.61, p-value < 0.05); **Girl's lack of mobility:** yes with Ref no (OR = 0.47, p-value < 0.01); **Parent's force for girl's marriage if she became pregnant:** yes with Ref no (OR = 2.28, p-value < 0.001)
(Pazvakawambwa et al., 2013)	Explaining Marital Patterns and Trends in Namibia: A Regression Analysis of 1992, 2000 and 2006 Demographic and Survey Data	Namibia	Cross-Sectional	9800 (DHS 2006)	Logistic regression	NA		
Significant Factors associated with female at marriage	**Birth cohort (Year):** 1992 with Ref 2006 (OR = 0.54, 95% CI= 0.47 – 0.61), 2000 (OR = 0.81, 95% CI = 0.73 – 0.91); **Female education:** none with Ref sec/higher (OR = 2.24, 95% CI = 1.92 – 2.61), primary (OR = 1.71, 95% CI = 1.52 – 1.93); **Religion:** Protestant with Ref Catholic (OR = 1.39, 95% CI= 1.25 – 1.56); **Employment:** employed with Ref unemployed (OR = 0.95, 95% CI= 0.85 – 1.051); **Wealth index:** poor with Ref poorest (OR = 1.01, 95% CI= 0.86 – 1.18), medium (OR = 1.16, 95% CI= 0.99 – 1.35), rich (OR = 1.05, 95% CI= 0.88 – 1.26),							

	richest (OR = 0.27, 95% CI= 0.22 – 0.34); **Region:** northwest with Ref south (OR = 0.71, 95% CI= 0.61 – 0.82), northeast (OR = 0.38, 95% CI= 0.32 – 0.44), central (OR = 1.21, 95% CI= 1.06 – 1.39)					
(Rasul et al., 2022)	Factors associated with female age at first marriage: An analysis using all waves of the Pakistan Demographic and Health Survey	Pakistan	Cross-Sectional	11590 (DHS; 2017/18)	Multiple Linear regression	19.7
Significant Factors associated with female at marriage	**Age cohort:** 40-44 with Ref 45-49 (Coef. = -0.344, SE = 0.141, p-value < 0.05), 30-34 (Coef. = -0.259, SE = 0.129, p-value < 0.05), 25-29 (Coef. = -0.743, SE = 0.128, p-value < 0.01); **Province of residence:** Sindh with Ref Punjab (Coef. = -0.781, SE = 0.118, p-value < 0.01), KPK (Coef. = -0.950, SE = 0.125, p-value < 0.01), Baluchistan (Coef. = -0.520, SE = 0.141, p-value < 0.01), Gilgit Baltistan (Coef. = -1.540, SE = 0.163, p-value < 0.01), FATA (Coef. = -1.153, SE = 0.173, p-value < 0.01); **Female education:** primary with Ref no (Coef. = 0.537, SE = 0.119, p-value < 0.01), secondary (Coef. = 1.865, SE = 0.111, p-value < 0.01), higher (Coef. = 4.205, SE = 0.136, p-value < 0.01); **Work status:** yes with Ref no (Coef. = 0.939, SE = 0.106, p-value < 0.01); **Husband education:** primary with Ref no (Coef. = .256, SE = 0.126, p-value < 0.05), secondary (Coef. = 0.587 SE = 0.102, p-value < 0.01), higher (Coef. = -0.680, SE = 0.122, p-value < 0.01)					
(Singh et al., 2023)	Patterns in age at first marriage and its determinants in India: A historical perspective of last 30 years (1992–2021)	India	Cross-Sectional	518773 (NFHS-V, 2019-21)	Cox PH	19.2
Significant Factors associated with female at marriage	**Current age:** 20 -24 with Ref 15-19 (AHR = 0.61, CI = 0.60-0.62, p-value <0.001), 25-29 (AHR = 0.50, CI = 0.50-0.51, p-value <0.001), 30-34 (AHR = 0.48, CI = 0.47-0.48, p-value <0.001), 35-39 (AHR = 0.46, CI = 0.46-0.47, p-value <0.001), 40-44 (AHR = 0.47, CI = 0.47-0.48, p-value <0.001), 45-49 (AHR = 0.42, CI = 0.42-0.43, p-value <0.001); **Female Education:** primary with Ref no education (AHR = 0.86, CI = 0.85-0.86, p-value <0.001), secondary (AHR = 0.63, CI = 0.62-0.63, p-value <0.001), higher (AHR = 0.37, CI = 0.36-0.37, p-value <0.001); **Mass media exposure:** any with Ref no (AHR = 0.96, CI = 0.95-0.96, p-value <0.001); **Place of residence:** rural with Ref urban (AHR = 1.05, CI = 1.05-1.06, p-value <0.001); **Caste:** scheduled tribes with Ref scheduled castes (AHR = 0.88, CI = 0.87-0.88, p-value <0.001), others (AHR = 0.98, CI = 0.97-0.98, p-value <0.001); **Religion:** Muslim with Ref Hindu (AHR = 0.86, CI = 0.86-0.87, p-value <0.001), Christian (AHR = 0.80, CI = 0.79-0.80, p-value <0.001), others (AHR = 0.80, CI = 0.80-0.81, p-value <0.001), **Wealth index:** poor with Ref poorest (AHR = 1.06, CI = 1.05-					

	1.06, p-value <0.001), middle (AHR = 1.03, CI = 1.02-1.04, p-value <0.001), richer (AHR = 0.97, CI = 0.96-0.98, p-value <0.01), richest (AHR = 0.91, CI = 0.90-0.91, p-value <0.05), **Region:** west with Ref East (AHR = 0.88, CI = 0.87-0.88, p-value <0.001), north (AHR = 0.87, CI = 0.86-0.87, p-value <0.001), south (AHR = 0.88, CI = 0.87-0.89, p-value <0.001), central (AHR = 1.05, CI = 1.04-1.06, p-value <0.001), northeast (AHR = 0.70, CI = 0.70-0.71, p-value <0.001).					
(Zahangir et al., 2008)	Determinants of Age at First Marriage of Rural Women in Bangladesh: A Cohort Analysis	Bangladesh	Cross-Sectional	7536 (DHS 2004)	Logistic regression	14.8
Significant Factors associated with female at marriage	**Female education:** primary with Ref no education (OR = 1.187, Coef. (β) = 0.171, p-value < 0.01), secondary and higher (OR = 3.820, Coef. (β) = 1.340, p-value < 0.01); **Access to media:** have access with Ref no access (OR = 1.159, Coef. (β) = 0.147, p-value < 0.01); **Religion:** Muslim with Ref others (OR = 1.466, Coef. (β) = 0.382, p-value < 0.01); **Husband's education:** primary with Ref no education (OR = 1.208, Coef. (β) = 0.189, p-value < 0.01), secondary and higher (OR = 1.340, Coef. (β) = 0.293, p-value < 0.01); **Childhood residence:** urban with Ref countryside (OR = 1.596, Coef. (β) = 0.468, p-value < 0.01); **Region:** Dhaka with Ref Rajshahi (OR = 1.245, Coef. (β) = 0.219, p-value < 0.01), Barisal (OR = 1.368, Coef. (β) = 0.319, p-value < 0.01), Chittagong (OR = 1.913, Coef. (β) = 0.649, p-value < 0.01), Sylhet (OR = 3.073, Coef. (β) = 1.123, p-value < 0.01); **Husband's occupation:** business with Ref agriculture (OR = 1.174, Coef. (β) = 0.161, p-value < 0.05), service (OR = 1.221, Coef. (β) = 0.200, p-value < 0.001).					

AAM = Age at Marriage, AOR = Adjusted Odds Ratio, BFS = Bangladesh Fertility Survey, Coef. = Coefficient, CI= Confidence Interval, DHS = Demographic Health Survey, HR= Hazard Ratio, LFS = Labour Force Survey, ME = Marginal Effect, NA = Not available, NFHS = National Family Health Survey, NHS = National Health Survey, OR= Odds Ratio, SD = Standard Deviation, SE = Standard Error, Ref.: Reference Category, TR = Time Ratio.

RESULTS

Search outcomes

Our search strategy initially captured a total of 605 records from EMBASE, PubMed and Scopus. PRISMA flowchart presented in Fig. 1 shows overall selection procedure and specific reasons of exclusion. Of the initially captured records, a total of 425 unique records were remained after removing 180 duplicate records. Following title and abstract screening, 374 records were rejected from the review. The main reasons for excluding 374 papers out of 425 were few key words matching either in title or in abstract, but those papers were not related with our study objective while going through the thorough screening of each title and abstract.

Fifty-one records were taken for full-text appraisal. Among them 34 were rejected due to different reasons. For example; 7 papers were qualitative in nature, 10 papers used descriptive statistics, 12 were based on statistical model but not dealt with reference categories (Chi-square, ANOVA, Multiple Classification Analysis (MCA) and regression coefficients) and 5 papers were completely based on theoretical aspect, not dealt with the factors. Following the PRISMA guideline, a total of 17 articles from 17 countries fulfilling the inclusion criteria are thoroughly reviewed and presented in table 1. Of the reviewed papers, 29.4% were published in between 2020 to till 2023, 35.3% were in between 2011 to 2019 and 29.4% were in between 2001 to 2010. Only one paper was published before 2000.

Study characteristics

The included studies were based on cross-sectional survey data relied on DHS or national data or the field surveys conducted by authentic source of respective countries as indicated in table 1. Among these data, 3 were captured from Bangladesh, 2 were captured from Nepal, and one study each from the remaining countries; India, Pakistan, Malaysia, Philippines, Oman, Sub-Saharan Africa, Burkina Faso and Tanzania, Malawi, Ethiopia, Nigeria, Namibia, Rwanda were captured. However, one study from Sub-Saharan Africa had combined the data of 3 countries - Kenya, Ghana and Zambia and another one study had taken the data set of Burkina Faso and Tanzania.

Fig. 2 represents the proportion of studies representing the regions according World Health Organization (WHO) regional classification. In the study, a total of 6 (35.3%) were captured from South-East Asian region including 3 studies from Bangladesh, 2 from Nepal and 1 from India. Likewise, 7 (41.2%) studies were from African region including one study each from Sub-Saharan Africa, Burkina Faso/Tanzania, Malawi, Ethiopia, Nigeria, Namibia and Rwanda. Similarly, 2 (11.7%) studies were captured from Eastern Mediterranean region including one study from Pakistan and one from Oman. The remaining 2 (11.7%) studies were captured from Western Pacific region including one study from Malaysia and one from Philippines.

Studies by WHO regional classification

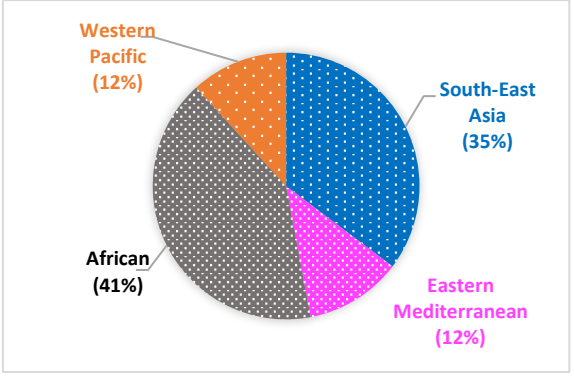

Fig. 2. Studies included in the review from different regions (n=17).

Factors associated with female age at marriage

This study accumulated 32 different significant factors associated with female age at first marriage. All 17 (100%) studies reported that female's education is a major significant determinant associated with age at marriage. The factor region of residence was explored in 8 (47.1%) studies. Other two factors ethnicity and religion were explored in 7 (41.2%) studies. The factor birth cohort was identified in 6 (35.3%) studies. Factors such as place of residence, place of childhood residence and female's work status were identified in 5 (29.4%) studies, and the factors like current age, wealth index and husband's education were identified in 4 (23.5%) studies. Similarly type of occupation was identified in 3(17.6%) studies, and husband's occupation, media exposure and father occupation were identified in 2(11.8%) studies. Other remaining factors identified in the studies were not found to be matched to each other study. Fig. 3 describes the factors distribution by the number of studies.

Thematic factors

All 32 identified factors have been classified into five thematic categories namely;

i. ***Demographic factor (21.9%)****:* Birth cohort, birth order, current age, age difference between spouse, ideal children, father survival status.
ii. ***Socioeconomic (34.4%)****:* Family social status, economic status, wealth index, female's education, parents supportive view to education, female's work status, type of occupation, father's education, mother's education, husband's education, husband's occupation, media exposure.
iii. ***Gender (18.7%):*** Gender equitable views among parents, girl's lack of mobility, girls lack in decision about marriage, parent's force for girl's marriage if she became pregnant, fathers support for girls to marry ≥18 years, parent support to girl's future aspiration.
iv. ***Socio-culture (15.6%)****:* Cast/ethnicity, religion, type of marriage, female's age at menarche, premarital sex before age of 15.
v. ***Community factor (9.4%)****:* Place of residence, region of residence, place of childhood residence.

Common factors by WHO regional classification

According to WHO regional country classification, 12 factors are observed to be common for at least two regions. Female's education is common for South East Asia, Africa, Eastern Mediterranean and Western Pacific regions. Place of residence, female's work status, region of residence and current age are common in South East Asia, Africa, Eastern Mediterranean regions. Ethnicity and birth cohort are common in South East Asia, Africa and Western Pacific regions. Wealth index, type of occupation, place of childhood residence and religion are common in South East Asia and Africa. Husband's education is common in South East Asia and Eastern Mediterranean regions. The stacked bar chart presented in Fig. 4 indicates the number of studies observed to be common in different regions based on the WHO regional classification.

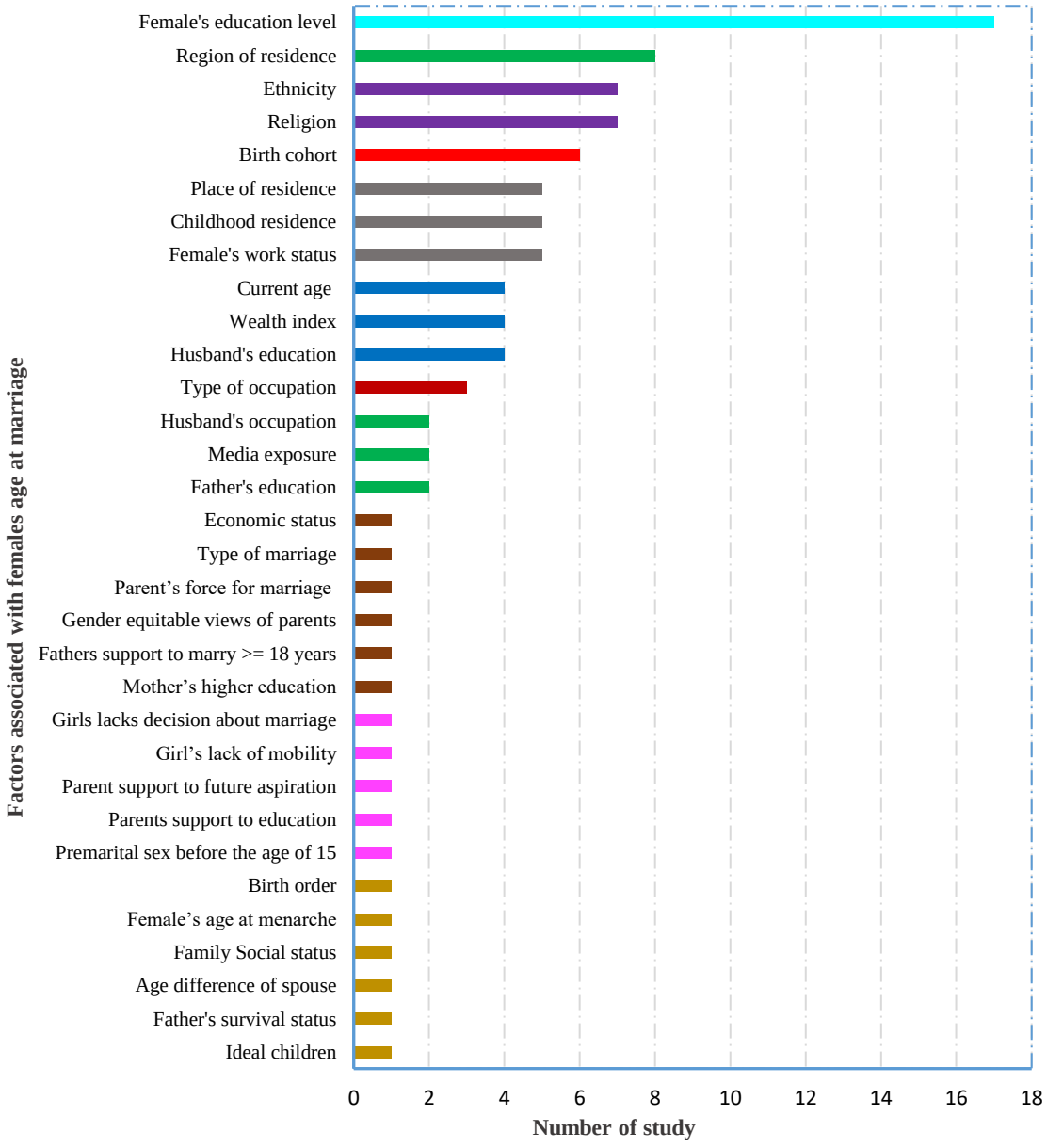

Fig. 3. Factors associated with female age at marriage (n=17).

Fig. 4. Common factors associated with females age at marriage by WHO classification.

Factors explored in the Western Pacific Region

Two studies captured in this region; one in Philippine and another in Malaysia (Abalos, 2014; Lai, 2021) explored that education, ethnicity and birth cohort were significant for influencing female age at first marriage. However, the impact of these factors had prevailed among the cohorts who had born before 1993. The importance of age at first marriage, roles in new family formation, family values and career development were discussed in these papers.

Factors explored in the African Region

Seven studies conducted in this region (Alazbih et al., 2023; Amoo, 2017; Gayawan & Adebayo, 2014; Jayaraman et al., 2009; Manda & Meyer, 2005; Misunas et al., 2021; Pazvakawambwa et al., 2013) explored twenty-one different factors that were associated with female age at marriage. Education, birth cohort, current age, ethnicity, religion, region of residence, place of urban-rural residence, place of childhood residence, females work status, type of occupation that the female engaged, ideal children, wealth index, premarital sex, parents supportive view to education, parent support to girl's future aspiration, girl's lack of mobility, girl's lacks on decision about her marriage, mother's education level, fathers support for girls to marry after the age of 18 years, gender equitable views among parents, parent's force for girl's marriage are observed to be influenced as major covariates for female age at marriage.

Factors explored in the South East Asian Region

Six studies conducted in this region (Aryal, 2007; Caltabiano & Castiglioni, 2008; Islam & Mahmud, 1996b; Kamal, 2011; Singh et al., 2023; Zahangir et al., 2008) explored twenty-one different factors that were associated with female age at marriage. Education, birth cohort, current

age, ethnicity, religion, region of residence, place of residence, place of childhood residence, wealth index, females work status, female's type of occupation, father's education, father's survival status, husband education, husband's occupation, age difference of spouse, family economic status, family social status, birth order, age at menarche, media exposure are observed to be influenced as major covariates for female age at marriage.

Factors explored in the Eastern Mediterranean

Two studies conducted in this region, one study in Pakistan and one study in Oman (Islam et al., 2013; Rasul et al., 2022) explored seven different factors associated with female age at marriage. Education, birth cohort, region of residence, place of residence, female's work status, husband's education and type of marriage are observed as major covariates for influencing female age at marriage.

Uncommon factors

In spite of common significant (p-value < 0.05) factors discussed in South-East Asia, Africa, Eastern Mediterranean and Western Pacific regions there were also found some uncommon and significant factors associating with female age at first marriage. Interestingly, factors such as; type of marriage, parent's force to marriage, economic status, father's support to marry after the age of 18 years, ideal children, parent's equitable view in gender, female age at menarche, mother's education, girl's role in her marriage decision, girl's mobility control, parent's support to girl's future aspiration, parent's support to girl's education, premarital sex before the age of 15, female's birth order, family social status, age difference of spouse, father's survival status are observed uncommon for the studies conducted in aforementioned countries and regions.

DISCUSSION

More than half of the studies 9(52.9%) were based on DHS data, 3(17.6%) National Health Survey and Fertility survey, and 1(5.8%) based on Labor Force Survey of respective countries. Remaining 4(23.5%) studies were based on primary data collected through field survey. Though the study design used in these papers was cross-sectional, some papers had treated the data as that of longitudinal considering the outcome as time to event applying survival modeling. Among the reviewed papers, one paper had analyzed the data in three waves of time period (1990-1999; 2000-2009; 2010-2014), and reported the effect size of different factors separately for each time wave. However, in this paper we have incorporated the effect size reported based on relatively the latest wave of time period (2010-2014). Among seventeen studies reviewed, 15 studies had reported the female mean/median age of marriage. Among those 15 studies, six studies had reported that the female mean/median age at marriage was below 18 years. The outcomes of early marriage are considered harmful for early pregnancy or early child bearing and adverse consequences for female's overall wellbeing (Jensen & Thornton, 2003). There are many reasons connected to female's age at marriage, though the most predominant factor is education. Level of education positively associated with female age at marriage, where the risk of early marriage is lower for female who had completed secondary and above secondary level of education in compared with those with primary education

or lower level of education (Abalos, 2014; Amoo, 2017; Gayawan & Adebayo, 2014; Hussain & Bittles, 1999). As the level of education increased the probability of child marriage and early marriage reduced significantly (Male & Wodon, 2018). Higher level of education associated with delayed age at marriage, which are more pronounced among female, especially in least developed or developing countries (Klat & Khudr, 1986). Furthermore, longer time spending in educational attainment create more opportunities to meet new friends, peoples and get modern ideas. It improves girl's decision-making capacity about their own life, and support to control early age at marriage (Abdullah et al., 2021). Females who spent shorter time in her educational attainment became backward, poor ability to engage in the labor market, and alternatively enter in early marriage and early pregnancy (Delprato et al., 2015). These are the major drawbacks associated with extended public health and socio-economic development.

In addition, current place of residence, region of residence and place of childhood residence are other kay factors identified in relation to female age at first marriage. These factors also observed as cross-cutting issues interrelated to education, employment and socioeconomic issues both in urban and rural area. Females grew up in the rural areas of the countries such as Nepal, Pakistan, Bangladesh, Oman, Nigeria and Rwanda identified significantly lower age at first marriage. Person's overall careers development and other facilities utilization in the countryside are comparatively less than that of urban cities (Lapierre-Adamcyk & Burch, 1974), since urban cities usually have better chance of multiple opportunities. Females residing in major urban areas have significantly less change of getting early age at marriage as compared to those who live in rural regions (Shahzad, 2021). Physical infrastructure, employment opportunities, access to education vary according to different geographical variation and their development (Gayawan & Adebayo, 2014; Islam, 2012). Geography and region of residence is, therefore, identified as one of the significant factors associated with female's age at marriage. Similarly, socioeconomic factors such as; family's economic condition, wealth index, social status are also identified as the significant determinants associated with female age at marriage. Likewise, parents or families having with lower social, economic and income status marry off their daughters sooner at the lower age (Streatfield et al., 2015). Thus, socioeconomic status is found to be the most influential factors in deciding the timing of female's age at marriage. On the other hand, access to media, gender equality, right to take self-decision, freedom of mobility help female to strengthen their empowerment. These factors are linked with social and economic upliftment, which ultimately work to control female's age at early marriage (Ko et al., 1985). In the developing countries of South East Asia and Africa poor socioeconomic condition is one of the major contributors for the cause of lower age at marriage (Singh, 1992), which are still in existence in the families and the society having with weak economic condition.

In addition, caste/ethnicity and religious values become institutionalized values of the society that impact on the timing of female's age at marriage, however, it could not find as an absolute reason for the people obeying different religion such as; Hinduism, Buddhism, Muslim, Islam and Christian. Various socioeconomic and socio-culture factors are interrelated to

caste/ethnicity and religion. The co-factors like social status, wealth, economic condition, employment are simultaneously connected to female age at marriage, early marriage and early motherhood (Kim Choe et al., 2005). Type of marriage is also another significant factor found to be impacted on female's age at first marriage. Arrange marriage, love marriage, own choice, living together, monogamous, polygynous and consanguinity are different types of marriage discussed in different papers (Ghrayeb & Rifai, 2015; Isiugo-Abanihe et al., 1993). Usually, consanguinity exist in the poor family, lack of education and social insecurity (Bakoush et al., 2016), where the marriage decision made by parent's or other family members. Female with no education or lower level of education do not object their parent's decision, and more likely to fall in consanguineous marriage as compared to those with higher level of education. Some specific factors such as access to mass media, parent's views about gender perspective, also played significant role on female age marriage. Female who had no access to any media marriage significantly at lower age (Zahangir et al., 2008). Other factors such as; sex before marriage (Isiugo-Abanihe et al., 1993), food security and father education, father's survival status also significantly impacted on female's age marriage. Father's education had a positive association with their daughter's age at marriage. Females whose fathers were alive at the time of her marriage married on average of 1.6 years later compare to those whose fathers were not arrived (Kamal, 2011). Likewise, family having balanced or surplus food and those who occasionally suffered from food insecurity have significant different of their daughters age at marriage. Those families who had occasionally food insecurity marriage off their daughter in lower age than that did not suffered by food scarcity.

Limitations

This paper is not free from limitations, since all this review relied on cross-sectional study design captured from only three database search engines. Relevant studies published in other sources may have missed. The Web of Science is one of the popular databases, however, in our case, we could not use it because of access limitation. Other gray literatures, mostly the reports, policy literatures, newsletters, government documents, etc. were not incorporated since the factors were not indicated using statistical models while going through such reports through manual process during screening of the studies. Therefore, it was not attempted to consider such gray literatures in this particular study. Our search was confined only for the papers published in English language, hence eligible papers published in other languages may be excluded. Our search did not consider the studies based on clinical factors such as; depression, anxiety and others clinical parameters like anemia, blood pressure, diabetics, breast cancer etc., generally measured biochemical and other medical considerations.

CONCLUSION

The articles presented in this review study identified numbers of factors and reasons connected with female age at first marriage. This paper has collected multiple similar studies and been able in clustering more common factors that have interconnected to existing socio-cultural system and socioeconomic dimensions. The effect sizes measuring in AOR, HR, CI, TR with p-value < 0.05 explored level of education, place of residence, religion, caste/ethnicity, birth cohort, current

age, female's work status, type of occupation, wealth index, husband's education are the major determinants significantly associated with female age at marriage. As the level of education increased the possibility of acquiring early age at marriage has been reduced significantly. The demographic, socio-economic, gender and community factors played significant roles at the timing of females age at marriages. Female age at marriage has also a considerable impact on fertility measures and population dynamics. Hence, policy relating to improving female's age at marriage and effective enforcement of law concerned to age at first marriage are required to address better public health issues, and also to meet SDGs targets. Furthermore, this paper would be immensely helpful for researchers for planning new study based on primary data capturing maximum number of variables from wider domain in a specific location or country.

CONFLICT OF INTEREST

The author(s) confirmed that there is no conflicts of interest in relation to the research, publication, and/or authorship of this article.

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