Quantitative Finance and Economics

QFE, 8(4): 841–866.
DOI: 10.3934/QFE.2024032
Received: 30 September 2024
Revised: 09 December 2024
Accepted: 17 December 2024
Published: 23 December 2024

https://www.aimspress.com/journal/QFE

Research article

Financial literacy among working adults: The case of Saudi Arabia

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Abstract: We aimed to evaluate the financial literacy of working adults in Saudi Arabia and to examine its correlation with various demographic factors. Data from 1,127 employed individuals were collected through an online survey. Descriptive analysis was used to compare the levels of financial literacy, while chi-square tests and regression analysis were employed to determine the impact of demographic factors. The results indicated that working adults in Saudi Arabia have satisfactory financial knowledge, particularly concerning gender, age, education, and the field of study. These demographic factors had a significant relationship with financial literacy. However, weaker connections were observed between financial literacy, living conditions, marital status, and job sector. This study highlights the importance of collaborative efforts to promote financial education among Saudi Arabian professionals. These findings offer valuable insights for policymakers and stakeholders by improving financial literacy among working adults.

Keywords: financial knowledge; financial education; working adults; Saudi Arabia

JEL Codes: G41, G51, G53

1. Introduction

Financial literacy is a pressing global issue because of the complexity of financial systems. In Saudi Arabia, government intervention is crucial for improving financial literacy in the predominantly young workforce. OECD reports show that adults' financial literacy is particularly low, with an average score of 12.7 out of 21 possible, raising concerns about managing financial risks in the future (Kiril, 2020).

Furthermore, Klapper and Lusardi (2020) findings on a worldwide sample show that only one in three adults is financially literate. Financially literate refers to an individual's ability to understand and effectively use various financial skills, including personal financial management, budgeting, saving, investing, and understanding financial risks. A financially literate person can make informed and effective decisions about their financial resources, ensuring long-term stability and achieving their economic goals. This literacy includes knowledge of basic financial concepts such as interest rates, inflation, debt management, and financial planning principles. In addition, several researchers who focused on young adults, such as (Breitbach and Walstad 2016), (Lusardi, 2012), and (de Bassa Scheresberg, 2013), found that young adults exhibit low levels of financial literacy. However, the increasing complexity and volatility of financial markets and the decreasing financial literacy are becoming global phenomena. However, several studies have focused on older adults, such as (Lusardi, 2012), (James et al., 2012), and (Mitchell and Lusardi, 2022), who show lower financial literacy in the older population. Financial literacy topics among working adults (young and old) have not been studied before in the Saudi population. However, research is limited to Saudi Arabia. Notably, studies were conducted by (Ansari et al., 2023) and (Seraj et al. 2022) and examined investors' perspectives and decision-making processes in the Saudi Arabian context.

Saudi Arabia has seen significant economic growth due to initiatives such as Vision 2030 and the National Transformation Programme. The Financial Sector Development Programme aims to boost financial literacy among citizens. However, there is a need for research on the financial literacy of working adults in the country. Thus, we focus on assessing the level of financial literacy among working adults and identifying the demographic factors influencing it. We examine the level of financial literacy among working adults in Saudi Arabia by reviewing other research. We begin with an introduction to financial literacy and its significance. Then, we delve into the literature on financial literacy among working adults before presenting findings and discussing data collection and analysis methods. The conclusion offers recommendations for regulators, educators, and policymakers to enhance financial literacy education in Saudi Arabia.

2. Literature review

We acknowledge the challenges and knowledge gaps in financial literacy among working professionals in Saudi Arabia. We identify areas that require further research, such as the long-term effects of financial education interventions, the impact of emerging financial technologies on financial literacy, and the effectiveness of workplace initiatives in improving financial literacy levels (Madeira and Margaretic, 2022) (Madeira, 2021).

Financial literacy is essential for the success of working professionals, as it involves understanding key financial principles, such as budgeting, saving, investing, managing debt, and retirement planning.

Financially literate individuals prioritize budgeting and tracking expenses to allocate income towards necessary expenses, savings, and investments, helping them to live within their means and avoid unnecessary debt (Madeira and Margaretic, 2022) (Madeira & Margaretic, 2022).

Financially savvy professionals prioritize saving a portion of their income for retirement, short-term objectives, and unforeseen expenses. They invest their savings in investment vehicles based on risk tolerance and financial goals. By understanding the value of compound interest, they manage debts effectively by prioritizing high-interest debt repayment and maintaining a good credit score for better loan terms and financial opportunities. Financial development is a crucial factor in determining economic growth (Zazili et al., 2017).

Steen et al. (2017) examined the effectiveness of various educational approaches, including workshops, seminars, online courses, workplace financial wellness programs, and employer-provided resources. It evaluates the outcomes of these interventions regarding knowledge acquisition, behavior change, and overall economic well-being.

Suh (2022) analyzed the saving behavior of British adults aged 30–49 not enrolled in state or company pension-saving programs. Salignac et al. (2019) described a conceptual framework for analyzing financial resilience from the viewpoint of financial inclusion.

Bakk and Kuha (2018) examined the importance of financial planning for working professionals, highlighting the benefits of compound interests and the potential for substantial financial growth over time. Their research also explored various investment alternatives, risk management, and portfolio diversification approaches. Coulter (2017) described how family structure and socioeconomic variables affected the rates of private renting among young adults heading to families between 2001 and 2011. This study analyzes the Office for the National Statistics Longitudinal Study of England and Wales.

Walker (2018) studied 448 business students from Canada, Denmark, Germany, and Iceland to assess their financial literacy and how they reflected on their portfolios. The results showed that most respondents displayed strong financial literacy and could accurately assess the risks, returns, and impact on financial well-being. Suh (2020) examined the effects of financial help and parental homeownership on young adults' ability to purchase a home. A cross-sectional logistic regression analysis was used to analyze homeowner characteristics.

Robertson-Rose (2019) examined how employees react to workplace savings plans and determined that fixed-term work negatively affects retirement savings and influences scheme membership and savings. Qualitative interviews were conducted with 25 employees in the UK, focusing on their socioeconomic status.

Payne et al. (2014) looked at 334 working couples to better understand the impact of family socialization processes on financial capacities and financial behaviors. Structural equation modeling was used to analyze both the direct and indirect correlations. Noone et al. (2012) indicated that levels of retirement planning were independently predicted by higher income, future time perspective (FTP), and financial expertise. Regardless of socioeconomic class, FTP and financial literacy affected financial planning similarly.

Karagiannaki (2017) examined how inheritance affected household wealth distribution in Great Britain between 1995 and 2005, a period that saw a significant growth in wealth and a substantial decline in wealth disparity. James et al. (2020) investigated how people anticipate the future when they make decisions about workplace pensions, considering whether they think about later life, how they

conceptualize it, and how these views shape their saving behavior. Grødem and Kitterød (2021) Financial literacy is not a one-time achievement but an ongoing process. Professionals with strong financial literacy habits continue to learn and adapt to the changing economic conditions, investment trends, and financial regulations. They remain informed about new financial products, tax laws, and strategies to make informed financial decisions (Suh, 2022).

Working adults in all countries often lack knowledge about financial products and services, such as savings accounts, investments, insurance, and retirement plans (Benjamin et al., 2020); (Siegfried and Wuttke, 2021). This lack of understanding can lead to poor decision-making and missed opportunities to build wealth and secure their financial future (Biener et al., 2014); (Van and Henkens, 2020); (Watts et al., 2018). Without proper financial literacy, working adults may not fully understand the implications of debt, such as interest rates, repayment terms, and the impact on their overall financial well-being. This can lead to financial stress and difficulties in effectively managing debt.

Herbert (2023) explored the benefits of paid labor for middle-aged women in rural Ireland, focusing on non-financial advantages often overlooked in the social gerontology literature. While financial motivations, wage disparities, health risks, and longer working lives are commonly discussed for women, the hidden benefits of employment for older women in rural areas are less frequently highlighted.

Financially savvy professionals emphasize saving a portion of their income for retirement, short-term goals, and unexpected costs (Foster and Heneghan, 2018); (Hasmanová and Soares, 2023). They invest their savings in stocks, bonds, mutual funds, or real estate based on their risk tolerance and financial goals and understand the benefits of compound interest (Sun et al., 2020). Employers and educational institutions are crucial in promoting financial literacy among working professionals. Employers can implement initiatives, such as financial wellness programs, access to financial resources, and integrating financial education into the workplace to support employees in making informed financial decisions.

Most respondents demonstrated basic financial literacy and an understanding of concepts such as inflation, the time value of money, and compounding interest (Van Rooij et al. 2011). However, some respondents lacked knowledge of the key distinctions between bonds and stocks, the relationship between bond prices and interest rates, and the basics of risk diversification. (Tavor, Garyn-Tal, 2016). In total, 107 questionnaires were distributed as part of this study. The questionnaire included inquiries about socioeconomic aspects and the respondent's decision-making process. For each respondent, the average risk tolerance was determined. Van Rooij et al. (2011) explored how financial literacy is conceptualized, identifying the core components and skills typically associated with financial literacy among working professionals. They also discuss the different measurement tools and scales employed in studies to evaluate financial literacy levels (Ventura and Horioka, 2020). The above discussion leads to the development of the following hypotheses:

H_{01}: Gender has a significant influence on financial literacy.

H_{02}: Age has a significant influence on financial literacy.

H_{03}: Living has a significant effect on financial literacy.

H_{04}: Marital status has a significant effect on financial literacy.

H_{05}: Region has a significant effect on financial literacy.

H_{06}: Education has a significant effect on financial literacy.
H_{07}: Specialization has a significant influence on financial literacy.
H_{08}: Job Sector significantly influences financial literacy.

3. Methods

In this section, we explain the step-by-step process of conducting this empirical study, including collecting and analyzing data to assess financial literacy's impact on working adults (Figure 1).

3.1. Descriptive statistics

Descriptive statistics provided a clear and concise overview of the data. The mean, median, standard deviation, and percentiles are the key statistics used to summarize the financial literacy scores of working adults. The mean represents the average score, the median indicates the midpoint of the scores, the standard deviation shows variability, and percentiles enable the determination of the percentage of individuals who scored above or below a certain threshold.

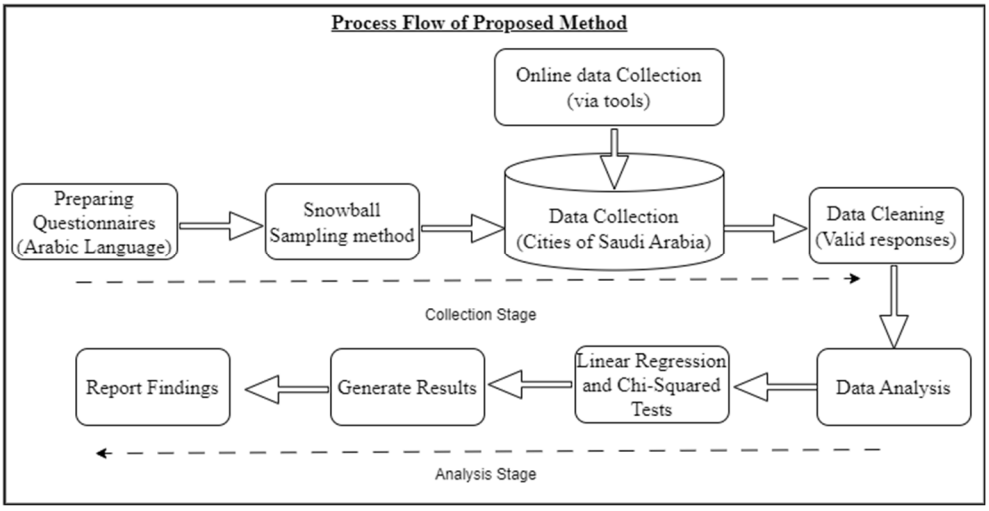

Figure 1. Pictorial overview of the proposed methodology.

These descriptive statistics can provide valuable insights for comparing financial literacy scores among different working-age groups and tracking changes in financial literacy over time. The methodology for studying working adults' financial literacy may vary depending on research questions, objectives, and available resources. Standard research methods have been used to examine working adults' financial literacy.

3.2. Survey search

Surveys are commonly used to collect data on working adults' financial literacy and to provide insights into their economic intelligence. A study in Saudi Arabia used structured survey

questionnaires and online tools to collect data from professionals in various cities, ensuring generalizability by including individuals from different socioeconomic backgrounds. The questionnaire was available in Arabic to accommodate language variety in the community. Snowball sampling was used to collect data from diverse groups within the community, resulting in 1,127 valid responses for data analysis.

We focus on the financial empowerment and literacy of working Saudi adults. The researchers used self-administered survey questionnaires and online data collection tools to gather information from professionals in various cities in Saudi Arabia. The sample selection process included individuals from diverse socioeconomic backgrounds to improve the generalizability of the results. The survey was available in Arabic to ensure all participants fully engaged with and interpreted the questions. Snowball sampling was used to collect data from various groups within the community, involving participants in the data-collection process to identify suitable candidates (Figure 2). Only 1,127 valid responses were received and used for the data analysis because multiple individuals were invited to participate.

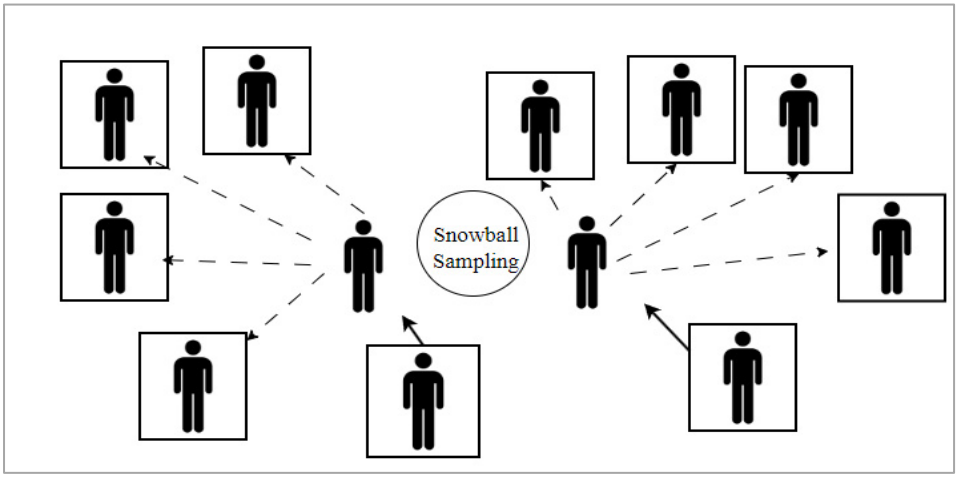

Figure 2. Snowball sampling technique for data collection in the survey.

3.3. Chi2-tests and Linear Regression models

We utilized chi2-tests and linear regression models to analyze financial literacy among working adults in Saudi Arabia. The chi2-test was used to test the hypotheses and examine contingency tables with large populations to determine whether two category variables independently impact the test results. This helps to identify whether differences between categorical variables are due to chance or if there is a connection between them.

Mathematically, the chi2-test formula is given by Equation (1):

$$x_c{}^2 = \frac{\sum(O_i - E_i)^2}{E_i} \tag{1}$$

In Equation (1), c denotes the degrees of freedom, O denotes the observed values, and E denotes the expected values. In this study, chi2-tests were used to determine whether the distribution of answers differed between men and women. These chi2-test findings provide a

mathematical lens through which researchers, policy makers, and trainers can identify and resolve gender-specific gaps in financial literacy.

The dependent variable was the proportion of respondents who correctly answered the financial literacy question. In this study, we designed eight different linear regression models, the equations of which are given in Equation (2–9):

$$Y = C + \beta Gender \tag{2}$$

$$Y = C + \beta_1 Gender + \beta_2 Age \tag{3}$$

$$Y = C + \beta_1 Gender + \beta_2 Age + \beta_3 Living \tag{4}$$

$$Y = C + \beta_1 Gender + \beta_2 Age + \beta_3 Living + \beta_4 Marital\ Status \tag{5}$$

$$Y = C + \beta_1 Gender + \beta_2 Age + \beta_3 Living + \beta_4 Marital\ Status + \beta_5 Region \tag{6}$$

$$Y = C + \beta_1 Gender + \beta_2 Age + \beta_3 Living + \beta_4 Marital\ Status + \beta_5 Region + \beta_6 Education \tag{7}$$

$$Y = C + \beta_1 Gender + \beta_2 Age + \beta_3 Living + \beta_4 Marital\ Status + \beta_5 Region + \beta_6 Education + \beta_7 Specialization \tag{8}$$

$$Y = C + \beta_1 Gender + \beta_2 Age + \beta_3 Living + \beta_4 Marital\ Status + \beta_5 Region + \beta_6 Education + \beta_7 Specialization + \beta_8 Job\ Sector \tag{9}$$

In Equation (2–9), Y denotes a dependent variable; $\beta_1 - \beta_8$ are the coefficients of the model; C is the constant term; and "$Gender$","Age","$Living$","$Marital\ Status$","$Region$", "$Education$", "$Specialization$", and "$Job\ Sector$" are the independent variables. Equation (2) is referred to as "Model-I," Equation (3) is "Model-II," Equation (4) is "Model-III," Equation (5) is "Model-IV," Equation (6) is "Model-V", Equation (7) is "Model-VI", Equation (8) is "Model-VII", and Equation (9) is "Model-VIII", The dataset contains 1127 samples, which correspond to the survey participants. R squared is reported to analyze the results of the regression, error values, model coefficients, t-statistics, significance, and (R^2). More precisely, in a regression model, *R* squared is the coefficient of determination and a statistical measure that denotes the percentage of a dependent variable's variation associated with the independent variable (that is, gender, age, living, marital status, region, education, specialization, and job sector). Mathematically, it is computed using Equation (10)

$$R^2 = 1 - \frac{RSS}{TSS} \tag{10}$$

In Equation (10), RSS denotes the sum of the squares of the residuals, and TSS is the total sum of squares. Additionally, the t-statistic was employed in a t-test to support or reject the null hypothesis. It is also defined as the ratio of a parameter's anticipated value to its hypothesized estimate divided by its standard error. Mathematically, this is computed using Equation (11).

$$t_B = \frac{B - B_0}{SE(B)} \tag{11}$$

In Equation (11), B denotes the estimator of the parameter, B_0 is a known constant (non-random), and $SE(B)$ is the standard error of the estimator. The ideal t-statistic has a statistically significant value, indicating that disparity between the two samples is unlikely to arise by coincidence.

3.4. Data analysis

Table 1 describes the various statistical tools that help to check the basis and fundamental statistical analysis: range, mean, standard deviation, skewness, and kurtosis. With the 1127 data samples, we applied all the required techniques, and the results showed that most of the values qualified the minimum threshold limit and crossed the required values. After these fundamental tools, advanced tools and techniques can be applied.

Table 1. Descriptive statistics for the working professional in Saudi Arabia.

Variables	Range	Min	Max	Sum	Mean	Std. Deviation	Skewness	Kurtosis
Age	3	2	5	3269	2.900	0.734	0.643	0.458
Gender	1	2	3	2987	2.650	0.477	−0.632	−1.604
Living	5	0	5	4830	4.285	1.015	−1.572	2.091
Marital Status	4	1	5	2097	1.860	0.746	1.631	4.672
Kids Under 18	11	1	12	3224	2.860	1.813	1.308	2.921
Region	12	1	13	3625	3.216	2.439	1.206	1.625
Education	4	1	5	3191	2.831	0.980	−0.139	0.103
Major	4	1	5	3167	2.810	1.727	0.183	−1.712
Job Status	3	1	4	2537	2.251	0.810	1.045	0.577
Job Sector	7	1	8	2892	2.566	1.527	0.588	−0.579
Interest Rate	4	1	5	1764	1.565	1.133	1.687	1.187
Inflation	3	1	4	2977	2.641	1.030	0.232	−1.34
Risk Diversification	2	1	3	2440	2.165	0.602	−0.088	−0.396

Although many respondents were invited to participate in the data collection process, only 1127 legitimate replies were collected and included in the data analysis. Based on the most recent recommendations and subsequent pertinent entrepreneurial research studies (Lin et al., 2021), (Ali et al., 2019), linear regression was used as a statistical method to analyze the data in this study. In order to estimate the research model, a structural model that examined the relationships between independent and dependent components, as well as collinearity concerns, was utilized. This model can simultaneously analyze several gender and dummy financial literacy models. A total of 1127 responses were received. Approximately 55% of the respondents were between the ages of 31 and 45, and 29% were between the ages of 25 and 30. More than 39% enrolled in business administration courses, 11% in engineering and humanitarian studies, and 30% in other subjects. Approximately 54% of students were enrolled in undergraduate courses. Almost 66% of the respondents were married, with 37% from Riyadh and 29% from Eastern Province. In addition, 38.42 percent were government employees,

whereas 31.94 percent worked in the private sector. Figure 3 shows a detailed pictorial representation of the participants and respondents of different age groups. For example, 3.19% of individuals were 60 years or older, 12.87% were 40–60 years old, 54.75% were 31–45 years old, and 29.19% were between 25–30 years old. The distribution of the participants' living locations is shown in Figure 4. On average, 3.28% of the participants live in villages (inhabited by fewer than 3000 people), 3.37% live in small governorates (inhabited by 3000–15000 people), 11.18% live in governorates (populated by 15000–100000 people), 25.73% reside in cities (inhabited by 10000–1000000 people), and approximately 56.43% live in large cities.

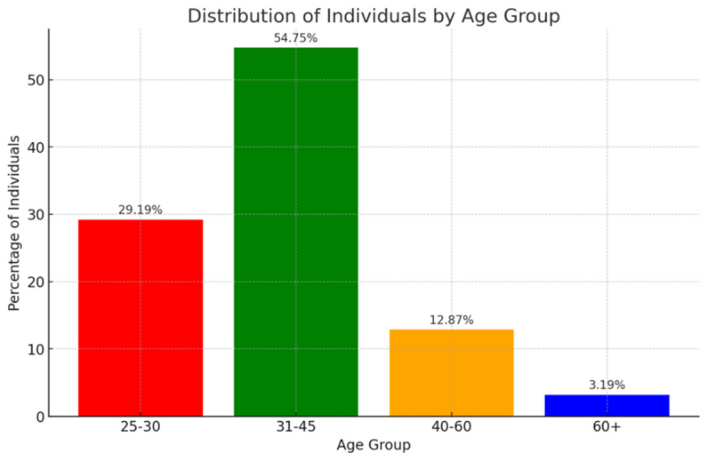

Figure 3. Distribution of age groups in data collection (numbers and percentages).

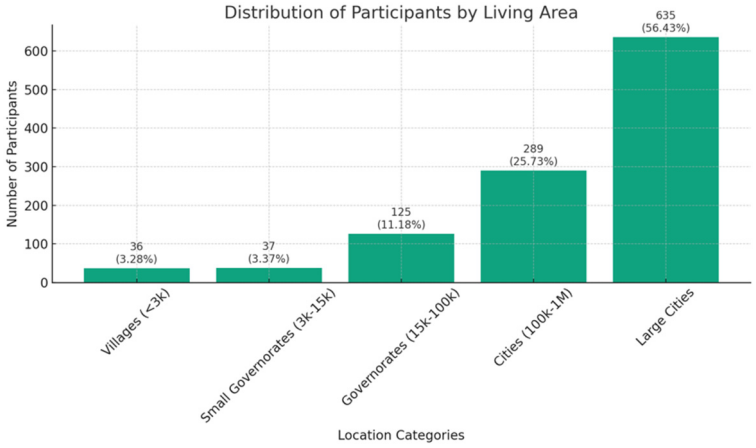

Figure 4. Distribution of locations/areas in data collection (numbers and percentages).

Moreover, the demographic characteristics of the participants are also disclosed in Table 2; 65.04% of the participants were female, and the remaining 34.96% were male.

Table 2. Demographic Characteristics of Participants.

Variable	N= 1127	Percentage, %
Gender		
Male	394	34.96
Female	733	65.04
Marital Status		
Single	309	27.42
Married	745	66.10
Widowed	09	0.80
Divorced	49	4.35
I do not wish to answer	15	1.33

The participants' marital status was as follows: 27.42% were single, 66.10% were married, 0.80% were widowed, 4.35% were divorced, and 1.33% declined to disclose their marital status. This study also reported the distribution of participants by region including Riyadh Province, Makkah Province, Medina Province, Qassim Province, Eastern Province, Asir Province, Tabuk Province, Hail Province, Northern Province, Jizan Province, Najran Province, Al-Baha Province, and Al-Jouf Province, as shown in Figure 5(a); the total number of participants from these regions is about 37.0%, 16.77%, 3.9%, 3.55%, 29.19%, 2.75%, 1.95%, 0.89%, 0.53%, 1.69%, 0.44%, 0.98%, and 0.27%. Figure 5(b) depicts the percentage of participants' academic qualifications: 12.6% have a high school diploma or lower, 15% have a diploma, 54.13% have a bachelor's degree, 13.22% have a master's degree, and 5.06% have a Ph.D. Figure 5(b) shows that most of the participants have a bachelor's degree.

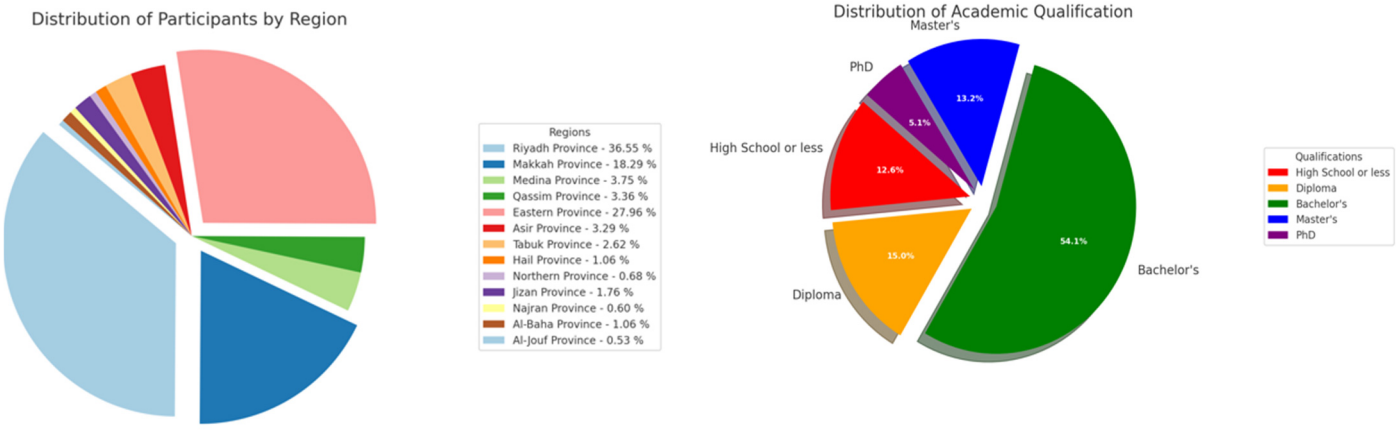

Figure 5. (a) Distribution of participants region by region in Saudi Arabia and (b) Distribution of academic qualifications of participants in the survey.

Table 3 provides additional information for the participants, such as employment status, employer, and specialization. For instance, 9.85% of the participants were students, 68.77% were employed, 7.81% were retired, and 13.58% were engaged in other occupations. Among these, 38.42% were government

employees. Regarding specialization, most participants (39.75%) worked in the administration, as shown in Table 3.

Table 3. Employment details of participants in data collection.

Variable	N= 1127	Percentage,%
Employment Status		
Student	111	9.85
Employee	775	68.77
Retired	88	7.81
Others	153	13.58
Employer		
Governmental	433	38.42
Military	96	8.52
Private Sector	360	31.94
The charitable and non-profit sector	22	1.95
Do not apply	208	18.46
Others	08	0.71
Specialization		
Administrative	448	39.75
Engineering	124	11.00
Medical	89	7.90
Humanitarian	126	11.18
Others	340	30.17

Tables 4 and 5 show the participants' responses to the scenario question. The first scenario question is, "Suppose you have 100 riyals in a savings account and the annual interest rate is 2%; if we let the money grow for 5 years, then what is the amount in the account." Four options were provided for this question. "More than 102 riyals," "Exactly 102," "Less than 102 riyals," "I don't know," and "I refuse to answer." It was observed that about 78.17% of participants selected the option of "More than 102 riyals, " and 2.75% of participants selected the option of "Exactly 102." Table 4 presents the results.

Table 4. Replies against scenario question No.1; "Suppose you have 100 riyals in a savings account and the annual interest rate is 2%; if we let the money grow for five years, then the amount is in the account."

Responses	N= 1127	Percentage,%
Scenario Question		
More than 102 riyals*	881	78.17
Exactly 102	31	2.75
Less than 102 riyals	57	5.06
I don't know	140	12.42
I refuse to answer	18	1.60

** indicates the correct answer. Source: Authors' calculation.*

Table 5. Replies against scenario question No. 2; "Suppose the interest rate on your savings account is 1% per annum, and the inflation rate is 2% per annum. One year later, you will be able to purchase. Products with the amount available in this account."

Responses	N= 1127	Percentage, %
Scenario Question		
More	108	9.58
Less*	548	48.62
Equal	111	9.85
I don't know	360	31.94

** indicates the correct answer. Source: Authors' calculation.*

Similarly, another scenario question was designed: "Suppose the interest rate on your savings account is 1% per annum, and the inflation rate is 2% per annum. One year later, you will be able to purchase. What will the products be with the amount available in this account?" To answer this question, there are four options: "More," "less," "Equal," and "I don't know." It is observed from Table 5 that about 48.62% participants have selected the option of "less" and only 9.58% participants have chosen the option of "more." In addition to the scenario question, the "True/False" statement-based question is also designed in which a statement "Buying one company's stock usually provides a safer return than a stock mutual fund." is provided to participants with three options "True," "False," and "I don't know." Table 6 shows that 60.96% of participants chose "True" while 11.27% chose "False." After summarizing the data, a thorough examination was conducted to explore the financial literacy levels of working adults in Saudi Arabia. In addition to percentages, the total counts are given in column N of Tables 2, 3, 4, 5, and 6 (i.e., out of 1127 participants).

Table 6. Replies against true/false question; "How true is the following statement? "Buying one company's stock usually provides a safer return than a stock mutual fund."

Responses	N= 1127	Percentage, %
True/False Question		
False*	127	11.27
True	687	60.96
I don't know	313	27.77

** indicates the correct answer. Source: Authors' calculation.*

A study of 1127 participants' true/false answers to questions about inflation and interest rates revealed that 32.74% (Table 7) demonstrated a strong understanding of both concepts, with most (36.47%) answering questions about interest rates correctly. The data showed that, while most respondents understood the concept of interest rates, uncertainty increased with complexity, particularly regarding inflation. Overall, the study indicates a need for educational interventions to improve the understanding of basic economic principles, especially in areas where gaps in knowledge are evident.

Table 7. Other statistics.

Responses	N= 1127	Percentage, %
True/False Question		
All three correct	369	32.74
Two correct (Interest rate and inflations)	411	36.47
One correct (Interest rate)	881	78.17
One I don't know (Interest rate)	140	12.42
Two I don't know (Interest rate and inflations)	94	8.34
Three, I don't know	57	5.06
None, Correct	153	13.58

Source: Authors' calculation.

4. Results

In this section, we provide a detailed analysis of financial literacy among working adults, along with the results acquired after data collection.

4.1. Financial literacy among working adults

After data acquisition, chi2-tests and linear regression models were employed to draw valuable insights from the data and highlight information regarding financial literacy among working adults in Saudi Arabia. Table 8 describes the working population's financial literacy with interest rate questions and the variances between working females and males in Saudi Arabia.

Most female participants answered correctly, approximately 881 out of 1112. Inclusive financial literacy is quite good at 78.2%. A large segment of working Saudis have a good awareness of financial concepts, which is high compared to other Asian and European countries. For example, 78.2% of the respondents correctly responded to the interest rate questions. First, working females are far more likely than males to respond thoughtfully to questions. Of the working females, 83.5% gave the correct answer on interest rate compared to 68.3 percent of male respondents. Females are far more likely than males to say they know the solution to the problem. However, working male respondents give more "do not know" responses than female respondents (59.3% vs. 40.7%). The results of the chi2-test indicate that, with a sample size of 1127, there are appreciable gender differences in the responses to the financial literacy question about interest rates with the relevant degree of freedom. The outcome reveals a gender disparity in the interest rate query. Working males are more likely to respond to questions correctly.

Table 9 lists the discrepancies between men and women in Saudi Arabia and the respondents' answers regarding literacy and inflation. Overall, the financial knowledge related to inflation is quite good at 48.6%. A large number of Saudis are well acquainted with inflation concepts. For example, 48.6%of the respondents answered the inflation questions correctly. In total, 23.9% of males gave the correct answer on inflation compared with 76.1% of working female respondents. Working females are far more likely than males to say they know the solution to a problem. Male respondents were more likely to respond "do not know" (71.4%) than female respondents (28.6%). The results of the chi2-test statistics indicate that the inflation questions' responses significantly differ between working males

and females, with an applicable degree of freedom and a sample size of 1127. The results reveal a gender gap in the inflation question.

Table 8. Statistics for interest rate question with working professionals.

Responses	Working Males	Working Females	Total Sample
More than 102 Riyals*	269	612	881
% within Interest Rate	30.5%	69.5%	100.0%
% within Gender	68.3%	83.5%	78.2%
Exactly 102 Riyals	12	19	31
% within Interest Rate	38.7%	61.3%	100.0%
% within Gender	3.0%	2.6%	2.8%
Less than 102 Riyals	25	32	57
% within Interest Rate	43.9%	56.1%	100.0%
% within Gender	6.3%	4.4%	5.1%
I don't know	83	57	140
% within Interest Rate	59.3%	40.7%	100.0%
% within Gender	21.1%	7.8%	12.4%
I refuse to answer	5	13	18
% within Interest Rate	27.8%	72.2%	100.0%
% within Gender	0.4%	1.2%	1.6%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	46.611[a]	4	0.000

Note: ** indicate the correct answer. Chi2-tests were used to determine whether the distribution of answers differed between men and women. Source: Authors' calculation.*

Table 10 details the financial literacy of the Saudi Arabian population, working hours, and questions on risk diversification. Financial literacy was weakly related to risk diversification (11.3 %). Many Saudis have inadequate knowledge of risk diversification compared to inflation concepts. For instance, 11.3% of respondents responded correctly to the risk diversification questions. Most crucially, working males are more likely to answer questions more accurately than working females. Of the working males, 44.9% gave the correct answer on risk diversification compared to 55.1 percent of the working females. Also, male respondents are more likely to respond "do not know" than Working females. The rate was 37.8%, instead of 22.4%. The results of the chi2-test demonstrate that the responses to the risk-diversification question significantly differ between working males and females with an applicable degree of freedom, with a sample size of 1127. The results show a gender gap in the risk-diversification question. Working males are more likely to respond correctly to risk diversification.

Table 9. Statistics for inflation question with working professionals.

Responses	Working Males	Working Females	Total Sample
More	42	66	108
% within Inflation	38.9%	61.1%	100.0%
% within Gender	3.7%	5.9%	9.6%
Less*	131	417	548
% within Inflation	23.9%	76.1%	100.0%
% within Gender	11.6%	37.0%	48.6%
Equal	45	66	111
% within Inflation	40.5%	59.5%	100.0%
% within Gender	11.4%	9.0%	9.8%
I Don't Know	176	184	360
% within Inflation	71.4%	28.6%	100.0%
% within Gender	26.2%	10.5%	36.7%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	62.424a	3	0.000

*Note: * indicate the correct answer. Chi2-tests were used to determine whether the distribution of responses differed between men and women. Source: Authors' calculation.*

Table 10. Statistics for risk diversification question with working professionals.

Responses	Working Males	Working Females	Total Sample
False*	57	70	127
% within Risk Diversification	44.9%	55.1%	100.0%
% within Gender	14.5%	9.5%	11.3%
True	188	499	687
% within Risk Diversification	27.4%	72.6%	100.0%
% within Gender	47.7%	68.1%	61.0%
I do not know	149	164	313
% within Risk Diversification	47.6%	52.4%	100.0%
% within Gender	37.8%	22.4%	27.8%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	44.932	2	0.000

*Note: * indicate the correct answer. Chi2-tests were used to determine whether the distribution of responses differed between men and women. Source: Authors' calculation.*

Table 11 details the results of all three questions on the financial literacy of the working population and the variances between males and females in Saudi Arabia. The financial literacy was very good (67.3%). Many working Saudis are well versed in interest rates, inflation, and risk diversification compared to other leading Asian and European countries. Most notably, more working males than females answered each of the three questions about financial literacy correctly, with a higher percentage of males than females responding correctly to each question. Based on the latter, the

correct interpretation is that among those who answered all three questions correctly, 79.7% were women, and 20.3% were men, not the other way around. Another significant and noticeable gender difference can be observed in the answers to these questions. The most incorrect answer was given by working males (81.0 %), while only 59.9% of the females did so. With a sample size of 1127, the chi2-test results demonstrated a substantial variance in the answers to the three questions between working males and females.

Table 11. Combined Statistics for all three correct questions.

Responses	Working Males	Working Females	Total Sample
Incorrect	319	439	758
% within All three correct	42.1%	57.9%	100.0%
% within Gender	81.0%	59.9%	67.3%
Correct	75	294	369
% within All three correct	20.3%	79.7%	100.0%
% within Gender	19.0%	40.1%	32.7%
Total	394	733	1127
% within All three correct	35.0%	65.0%	100.0%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	51.678	1	0.000

** Note: Chi2-tests were used to determine whether the distribution of answers differed between men and women.*
Source: Authors' calculation.

Table 12 describes the financial literacy of the working population using two correct questions on interest rates and inflation in Saudi Arabia. The financial literacy secured a good percentage (63.5%). A large division of working Saudis has a good knowledge of interest rates and inflation concepts. In addition, 63.5% of the participants answered these two questions correctly. Most notably, males are more likely than females to answer inflation and interest rate questions correctly. For each question, more females than males gave the correct answers. For instance, 44.3% of females correctly responded to both questions, compared to 21.8% of males. Another significant and noticeable gender difference can be observed in the answers to these questions. Males (78.2 %) gave the most incorrect answers, while only 55.7% of females did. The results of the chi2-test revealed that working male and female responses to the two right questions differed significantly.

The differences between working males and females among Saudi Arabian respondents are shown in Table 13, along with a question *to which I do not know the answer*. Financial literacy was quite good at 12.4%. A large proportion of working Saudis have good knowledge of financial literacy questions. Only 12.4% opted for one "*I do not know the question*". Most importantly, males have decided more than females; for one, I do not know the question. For example, 59.3% of working males opted for this option, but 40.7% of working females did. The chi2-test statistics show that the I do not know question significantly differs between working males and females with the applicable degree of freedom, with a sample size of 1127.

Table 12. Statistics for interest & inflation question.

Responses	Male	Female	Total Sample
No	308	408	716
% within two correct	43.0%	57.0%	100.0%
% within Gender	78.2%	55.7%	63.5%
Yes	86_a	325_b	411
% within two correct	20.9%	79.1%	100.0%
% within Gender	21.8%	44.3%	36.5%
Total	394	733	1127
% within two correct	35.0%	65.0%	100.0%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	56.047a	1	0.000

**Note: Chi2-tests are used to determine whether the distribution of the answers between men and women differs.*

Source: Authors' calculation.

The three I do not know questions are summarized in Table 14, along with the distinctions between working males and females in Saudi Arabia. Financial literacy was quite good, with 94.9% saying no to all three questions. A large section of working Saudis have good knowledge of financial literacy questions. Only 5.1% of the population opted for the third option; I did not know the questions. Most importantly, working males opted for more than three females. I do not know of this question. For example, 8.1% of males have opted for this option, but only 3.4% of females opted for it. Working females (96.6 %) gave this question the most common choice, while only 91.9% of males did so. The chi2-test statistics show that all three I do not know questions significantly differ between working males and females with the applicable degree of freedom, with a sample size of 1127.

Table 13. Summary statistics for one I don't know question.

Responses	Male	Female	Total Sample
No	311	676	987
% within One I don't know	31.5%	68.5%	100.0%
% within Gender	78.9%	92.2%	87.6%
Yes	83	57	140
% within One I don't know	59.3%	40.7%	100.0%
% within Gender	21.1%	7.8%	12.4%
Total	394	733	1127
% within One I don't know	35.0%	65.0%	100.0%
Chi2-tests			
	Value	df	Sig.
Pearson chi-2	41.602a	1	0.000

Note: chi2-tests were used to determine whether the distribution of answers differed between men and women.

Source: Authors' calculation.

Table 14. Summary statistics for three I don't know question.

Responses	Male	Female	Total Sample
No	362	708	1070
% within Three, I don't know	33.8%	66.2%	100.0%
% within Gender	91.9%	96.6%	94.9%
Yes	32	25	57
% within Three, I don't know	56.1%	43.9%	100.0%
% within Gender	8.1%	3.4%	5.1%
Total	394	733	1127
% within Three, I don't know	35.0%	65.0%	100.0%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	11.845a	1	0.001

Note: Chi2-tests were used to determine whether the distribution of answers differed between men and women.

Source: Authors' calculation.

Table 15. Summary statistics for all incorrect questions.

Responses	Male	Female	Total Sample
No	310	664	974
% within None Correct	31.8%	68.2%	100.0%
% within Gender	78.7%	90.6%	86.4%
Yes	84	69	153
% within None Correct	54.9%	45.1%	100.0%
% within Gender	21.3%	9.4%	13.6%
Total	394	733	1127
% within None Correct	35.0%	65.0%	100.0%
Chi2-tests			
	Value	df	Sig.
Pearson Chi-2	30.963a	1	0.000

Note: Chi2-tests were used to determine whether the distribution of answers differed between men and women.

Source: Authors' calculation.

The incorrect questions and distinctions between working males and females in Saudi Arabia are shown in Table 15. Very few people lacked financial literacy, with less than 13.6% answering all the wrong questions. Most importantly, males opted more than females for all the incorrect questions. For example, 21.3% of males opted for this option, while 9.4% of females opted out. This is the most important opportunity to answer this question. The chi2-test statistics show that all incorrect questions significantly differed between working males and females with an applicable degree of freedom, with a sample size of 1127.

4.2. Linear Regression model findings

In the previous section, we present the findings by considering how men and women differ in financial literacy by employing chi2-tests on responses acquired by posing different scenario-based questions to the participants. However, these inequalities persist when considering the demographic and economic traits of men and women. To answer this, regression models are designed and defined in equation (2–9), the results of which are given in Table 16. The previously stated theoretical models serve as the driving forces behind the variables used in the regressions. The dv dummy variable in Table 16 was set to one for respondents correctly answering all three financial literacy questions. These regressions are referred to as additional descriptive statistics to help identify whether gender variations in financial awareness are primarily caused by differences in education or income between men and women. To measure the gender effect, we added controls to the blocks of variables. More precisely, in Table 16, the first column shows the variable names used in the different models, starting from I–VIII.

The column labeled "B" represents the coefficients of the independent variables in the regression model. These coefficients estimate the change in the probability of the dependent variable being one (or the event occurring) for a one-unit increase in the independent variable, holding all other variables constant.

Similarly, t denotes the t-statistic, Sig denotes significance, N is the total number of samples, and R^2 is the R-squared value of the model in Table 16. It is observed from Table 16 that the lowest R^2 is attained with Model VI, in which all dependent variables are involved, including *gender, age, living, marital status*, *education*, and *job sector*, while the highest R^2 is attained with Model II, with only two independent variables, i.e., "gender" and "age." Similarly, almost all the models produced the lowest error values when analyzing the errors.

We have discussed the differences in financial literacy between working men and women and their numerous influences on financial literacy. However, we ask the following question: Do these inequalities persist when considering the different demographic and economic traits of males and females? We present a set of multiple linear regressions using data from working professionals in Saudi Arabia (Table 16). The previously stated theoretical models serve as the driving force behind the variables used in the regressions. The dummy variable in this table is set to 1 for working respondents who correctly answered all three financial literacy questions. These regressions are intended to serve as additional descriptive data that may be used to determine whether gender differences in financial awareness are primarily a result of educational or economic disparities between working males and females. To measure the gender effect, we added controls to the blocks of the variables.

To account for the gender gap in financial literacy, we added a new dummy variable and a set of controls to each regression model from I–VIII. Working Saudis have good financial awareness, inflation, and knowledge of risk diversification. According to our research, gender was highly associated with all three correct answers; the coefficient value was 0.214. Age, education, and specialization have been linked statistically significantly to financial literacy, awareness, and risk diversification. Having perfect financial knowledge causes living, marital status, and region to be insignificant factors. The job sector also has a bearing on financial literacy and awareness.

Table 16. Results of Linear Probability Model: Dependent variables All Correct.

Variable	B	Std. Error	Beta	t	Sig.	N	R^2
Model I							
(Constant)	−0.231	0.077	0.081	−2.994	0.003	1127	0.214
Gender	0.211	0.029	0.214	7.353	**0.000**		
Model II							
(Constant)	−0.361	0.090	0.081	−3.999	0.000	1127	0.229
Age	0.051	0.019	0.080	2.755	**0.006**		
Gender	0.203	0.029	0.207	7.085	**0.000**		
Model III							
(Constant)	−0.372	0.106	0.081	−3.525	0.000	1127	0.229
Age	0.051	0.019	0.080	2.746	**0.006**		
Gender	0.203	0.029	0.207	7.078	**0.000**		
Living	0.003	0.013	0.006	0.211	0.833		
Model IV							
(Constant)	−0.378	0.109	0.081	−3.471	0.001	1127	0.232
Age	0.050	0.020	0.078	2.519	**0.012**		
Gender	0.204	0.029	0.207	7.056	**0.000**		
Living	0.003	0.013	0.006	0.214	0.831		
Marital Status	0.004	0.019	0.007	0.220	0.826		
Model V							
(Constant)	−0.356	0.119	0.081	−2.992	0.003	1127	0.271
Age	0.054	0.020	0.084	2.686	0.007		
Gender	0.204	0.029	0.207	7.048	0.000		
Living	0.001	0.015	0.002	0.070	0.944		
Marital Status	0.007	0.020	0.011	0.366	0.714		
Region	−0.001	0.006	−0.003	−0.100	0.920		
Model VI							
(Constant)	−0.528	0.123	0.081	−4.293	0.000	1127	0.271
Age	0.050	0.020	0.078	2.495	0.013		
Gender	0.212	0.029	0.215	7.388	0.000		
Living	−0.006	0.015	−0.013	−0.409	0.683		
Marital Status	0.007	0.019	0.011	0.359	0.720		
Region	0.001	0.006	0.005	0.141	0.888		
Education	0.068	0.014	0.142	4.861	**0.000**		

Continued on next page

Variable	B	Std. Error	Beta	t	Sig.	N	R^2
Model VII							
(Constant)	−0.391	0.130	0.081	−3.007	0.003		
Age	0.052	0.020	0.081	2.597	0.010		
Gender	0.195	0.029	0.199	6.732	0.000		
Living	−0.012	0.015	−0.025	−0.784	0.433		
Marital Status	0.009	0.019	0.014	0.464	0.643	1127	0.286
Region	0.000	0.006	−0.001	−0.031	0.975		
Education	0.065	0.014	0.136	4.676	**0.000**		
Specialization	−0.026	0.008	−0.094	−3.185	**0.001**		
Model VIII							
(Constant)	−0.476	0.146	0.081	−3.251	0.001		
Age	0.068	0.021	0.106	3.179	**0.002**		
Gender	0.208	0.030	0.211	6.928	**0.000**		
Living	−0.014	0.015	−0.030	−0.930	0.352		
Marital Status	0.005	0.019	0.008	0.246	0.806	1127	0.293
Region	−0.020	0.006	0.000	0.000	1.000		
Education	0.071	0.014	0.148	4.968	**0.000**		
Specialization	−0.024	0.008	−0.089	−2.988	**0.003**		
Job Sector	0.020	0.010	0.065	2.012	**0.044**		

Notes: This figure shows the results of numerous linear regressions performed on diverse datasets. The dependent variable is the proportion of respondents correctly answering the three financial literacy questions. The percentage of respondents who correctly answered the three questions regarding financial literacy is the baseline for all regression models.
Source: Authors' calculation.

According to Table 17, gender was positively related to financial literacy. Therefore, Hypothesis H_{01} is supported. This finding implies that gender is significantly associated with financial literacy. Moving forward, those aged 25–30 and above 60 were positively related to basic financial knowledge. Hence, hypothesis H_{02} is supported. This finding indicates that age has a significant relationship with financial literacy. Regression analysis showed that living, marital status, and region had no significant relationship with financial literacy. Hence, Hypotheses H_{03}, H_{04}, and H_{05} are not supported.

Additionally, working adults' educational level and specialization were significantly correlated with their financial knowledge. This signifies that an individual's education level and area of specialization influence their financial knowledge. This result leads to the acceptance of Hypotheses H_{06} and H_{07}.

Additionally, working adults' job sectors share direct relationships with financial knowledge. This indicates that an individual's job sector influences their level of financial literacy. Therefore, Hypothesis H_{08} is supported.

Table 17. Relationship between demographic factors and financial literacy.

Null Hypothesis	Relationship	Test Result-Null Hypothesis
H_{01}	Gender>Financial Literacy	Supported
H_{02}	Age>Financial Literacy	Supported
H_{03}	Living->Financial Literacy	Not Supported
H_{04}	Marital status->Financial Literacy	Not Supported
H_{05}	Region->Financial Literacy	Not Supported
H_{06}	Education->Financial Literacy	Supported
H_{07}	Specialization->Financial Literacy	Supported
H_{08}	Job-sector->Financial Literacy	Supported

5. Discussion

Employer and institutional initiatives, employers, and educational institutions are vital to promoting financial literacy among working professionals. In this section, we explore the initiatives employers can undertake, such as offering financial wellness programs, providing access to financial resources, and integrating financial education into the workplace. We also discuss the importance of incorporating financial literacy into the educational curricula. Moreover, we summarize the key points discussed in the manuscript, emphasizing the importance of financial literacy among working professionals. This reiterates the impact of financial literacy on financial well-being and highlights the role of various stakeholders in fostering financial literacy. It encourages working professionals to embrace continuous learning and proactive financial management.

We included a working population sample of 1,127 respondents. Approximately 35% of the respondents were male, and 65 % were females from different age groups. 55% belong to the 31–45 age group, and 13% are from the 46-60 age group. In addition, 56% live in large Saudi Arabia, while 26% live in cities. However, only 3% of the working respondents lived in villages or small governorates. Almost 27% of the respondents had a bachelor's degree, and 66% were married. In addition, more than 37% belonged to the Riyadh Region and 29% to the eastern province. Moreover, 68% were employed, 38% were government employees, and 32% were from the private sector. However, 78% of working professionals responded appropriately to the interest rate query, and 48% were given the correct answer to the inflation question.

The results of the symmetry analysis show that demographic factors, including gender, education, and specialization, strongly influence tendencies toward financial literacy. A few demographic variables, such as living, marital status, and job sector, were not strongly linked to the emergence of financial literacy among working Saudi professionals. (Burcher, Serido et al. 2021) According to this study, financial education programs can favor working financial knowledge and behavior. Financial literacy also has a substantial impact on financial decision-making. However, further investigation is required to comprehend a few barriers to accessing financial education and to develop effective strategies to address these barriers (Fan, Babiarz 2019).

6. Conclusions

Financial literacy among working professionals in Saudi Arabia is limited but can be improved through formal financial education and awareness campaigns. Working adults must possess this skill mainly because they manage their finances for the first time. Many professionals enhance their financial literacy through workshops, seminars, online courses, reading, seeking expert advice, and staying informed of economic changes. Financial literacy is an ongoing process, and professionals must continue to adapt to changing conditions and regulations. Employers, policymakers, and educational institutions should collaborate to promote financial literacy and provide accessible resources to working professionals.

In this study, we comprehensively evaluate financial literacy among working adults in Saudi Arabia and identify significant demographic factors influencing financial knowledge. The findings reveal that while financial literacy is generally satisfactory among employed individuals, specific demographic variables such as gender, age, education level, and field of study play a pivotal role in shaping financial knowledge. These insights underscore the need for targeted financial education programs tailored to different demographic groups, particularly focusing on enhancing the financial literacy of underrepresented segments.

The weaker associations observed between financial literacy and variables such as living conditions, marital status, and job sector suggest that financial education initiatives may benefit from a broader, inclusive approach that addresses a wider range of socio-economic factors. Policymakers and stakeholders should collaborate to design and implement sustainable financial education strategies, integrating these into professional development frameworks. By addressing gaps in financial literacy, this study emphasizes the potential for improved financial decision-making and economic well-being among Saudi professionals. Furthermore, these findings serve as a foundation for future research to explore deeper causal relationships and assess the effectiveness of financial literacy programs, thereby contributing to a more financially empowered workforce in Saudi Arabia.

This study highlights the significant impact of financial literacy on the quality of self-reported financial information among working adults in Saudi Arabia. The findings reveal that individuals with higher levels of financial literacy tend to report more accurate and comprehensive financial information, reflecting a deeper understanding of personal finance concepts. Key demographic factors such as gender, age, education level, and field of study are strong predictors of financial literacy, underscoring the importance of targeted educational interventions to enhance financial knowledge. The benefits of financial literacy extend beyond accurate self-reporting; individuals with higher financial literacy are better equipped to manage debt, make informed investment decisions, and renegotiate mortgages more efficiently. These competencies contribute to improved financial stability, reduced financial stress, and better long-term planning. Furthermore, financial literacy enhances individuals' ability to assess risks, prioritize savings, and navigate complex financial products, fostering greater economic resilience.

For policymakers and stakeholders, these findings emphasize the need for tailored financial education programs that address specific knowledge gaps and demographic disparities. Such initiatives can empower individuals to make informed financial decisions, leading to a more financially literate population capable of contributing to broader economic development. Future research could explore

the longitudinal effects of financial literacy programs on financial behavior and decision-making, offering actionable insights for improving financial education strategies.

Author contributions

M.S.A.-, Project Administration, Formal Analysis, Resources, Supervision, Writing — Review & Editing

S.A.A.- Data Curation, Investigation, Visualization, Validation

Y.A.- Conceptualization, Methodology, Software, Writing — Original Draft

Use of AI tools declaration

This research does not utilize any AI tools.

Conflict of interest

The Authors declare that there is no conflict of interest.

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