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BORROWING FOR HEALTH, SUSTAINABILITY, CREDIT CARD USE AND OWNERSHIP: A STUDY OF 74 COUNTRIES

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Abstract. With the rising cost of healthcare, most households are resorting to out-of-pocket financing or borrowing to finance the high cost of health care. Intuitively, healthcare's rising cost is a global concern and is subject to a thorough economic debate. The Sustainable Development Goals (SDGs) 3 focuses on health care financing for all ages to promote everyone's healthy lifestyle. There are two objectives of this study, and these are as follows: (1) Examine the relationship between borrowing for health or medical purposes and credit card use and ownership, and (2) Explore the significant gender differences concerning borrowing for health or medical purposes. Data for this study was collected from the Global Findex Database and analyzed using the Eviews8 and Microsoft Excel software. The findings from this study confirmed that borrowing for health or medical purposes, primary education, or less (% age 15+) has a statistically significant impact on credit card ownership and usage in high-income countries. There was no relationship of this nature evident in the case of low-income countries. There are significant differences between borrowing for health or medical reasons between males and females in Austria and Lithuania. Both Austria and Lithuania are high-income countries, but in the case of low-income countries, significant gender differences were found for Madagascar and Nepal. This study is timely and has contributed immensely to the existing literature.

Keywords: healthcare; rising cost; low-income countries; high-income countries

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1. Introduction

The accessibility of quality health care services has not only become a national issue, but it has become a global concern. Numerous international discussion forums and meetings continuously emphasize the role of a responsible government in providing access to high-quality and affordable health services to its citizens (Kates et al., 2021; Behzadifar et al., 2020; Chu et al., 2019). Several studies have argued that the provision of health care services is a public good that the state cannot provide alone, and it needs private sector involvement to provide high-quality health services (Yamey et al., 2019; Chu et al., 2019). The primary aim of universal health care coverage is that everyone can access healthcare services without facing financial difficulties while paying for these services. One of the major objectives of private sector involvement in providing health care services is to achieve economies of scale and transfer these savings to consumers (Wagstaff & Neelsen, 2020; Agustina et al., 2019). In September 2015, around 193 countries worldwide agreed to the overly ambitious Sustainable Development Goal 3 (SDG 3) of providing universal healthcare coverage that is feasible and affordable to everyone. The central issue of contention is whether these countries would achieve these goals, if healthcare financing is a costly affair to all households (Rokicki et al., 2021; Fryatt & Bhuwanee, 2017). In these situations, financial innovations, such as credit cards, can act as tools for providing short-term funds for meeting household needs for healthcare expenditure (Spiegel et al., 2020; Xiao & Tao, 2020).

A close examination of the recent statistics on global healthcare spending over the last 20 years shows that the cost of global healthcare has increased over 70%, and this undoubtedly explains the rising cases of health problems reported in hospitals, and the government is spending millions of dollars to tackle these health problems. The recent statistics on government spending on health care coverage is alarming as Vietnam, Indonesia, the Philippines, and Malaysia are spending around 1.1% to 3.8% of GDP on health care (Gildea, 2019). Singapore and Thailand's spending on global healthcare coverage are much greater as it falls in the range of 4.1% to 4.9% of GDP (Gildea, 2019). As far as the global average for the OECD countries is concerned, health care coverage falls in the range of 6% to 7.7% of GDP (Gildea, 2019). In most countries worldwide, individuals and households are borrowing money to finance the rising cost of health care, as their income is not sufficient to meet the financial burden of the rising cost of health care coverage. This study specifically focuses on two crucial research questions: (1) Examine the relationship between borrowing for health or medical purposes and credit card use and ownership, and (2) Explore the significant gender differences in borrowing for health or medical purposes.

Despite the growing cost of healthcare, there are hardly any studies that have examined the relationship between borrowing for health or medical purposes and credit card use and ownership. This is a timely and significant study as it explores the individual's and household's borrowing behavior for health or medical purposes and the use of financial facilities to borrow from bank and non-bank financial institutions. Additionally, this study takes a step forward by exploring significant differences in borrowing for health or medical purposes in high and low-income countries. There are two reasons why this study is timely and significant. Firstly, this study reviews the existing literature and produces research-based evidence to extend the existing literature on the use of credit cards to meet a household's short-term need for health financing. Secondly, the research questions proposed in this study help address a national problem on the rising cost of healthcare by exploring gender differences in people's borrowing behavior in different geographical settings.

This paper is structured as follows. Section two provides the theoretical orientation, and section three reviews the existing literature. Section four outlines the research methodology, and section five presents the research findings. Section six discusses the research findings, and section seven presents the scientific knowledge and practical value. Section eight provides the conclusion, limitations, and directions for future research.

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2. Theoretical Orientations

A thorough examination of the existing literature shows that several theories have been used to explain the reasons why individuals own and use credit cards (Arango et al., 2021; Santos et al., 2019; Greenacre and Akbar, 2019; Nugroho et al., 2018; Singh et al., 2018). One of the hotly debated and researched areas related to credit card ownership and use is the need for credit cardholder to have good financial knowledge and engage in responsible financial behavior when purchasing goods and services by using credit cards (Xiao et al., 2011; Zinman, 2009; Robb, 2011). This study's core issue is to examine if borrowing for health and medicine purposes influences credit card ownership and use by individuals. One of the theories that have been used in the academic literature to explain peoples buying and purchasing behavior is the Theory of Planned Behavior (Arango et al., 2021; Santos et al., 2019; Greenacre and Akbar, 2019; Nugroho et al., 2018; Singh et al., 2018). This theory is an expansion of the Theory of Reasoned Action that explains an individual's behavior at any point in time.

Drawing from the Theory of Planned Behavior and applying this theory directly to the research question proposed in this study, it can be argued that individuals borrow for several reasons and from several sources. People may borrow to meet their consumption, needs for necessity, or luxury goods and services. The first research question proposed in this study argues that borrowing for health or medical purposes is categorized as borrowing for necessity, as good health is the source of natural wellbeing and survival. The eclectic mix of studies that have applied the Theory of Planned Behavior to different research questions has helped us understand and comprehend individuals purchasing behavior in a different geographical context.

Operationally, the Theory of Planned Behavior can be used to explain why there may be significant gender differences in explaining the borrowing behaviour of gender groups in different geographical settings. De Mooij (2019) and Nunkoo & Ramkissoon (2010) argued that male and female consumption and buying behavior differ across geographical settings. Thus, this study uses the gendered Theory of Planned Behavior to explain the differences in borrowing patterns of different gender groups in unique geographical settings.

Theory of Planned Behavior: Icek Ajzen

The Theory of Planned Behavior is merely an extension of the Theory of Reasoned Action as it includes the attributes related to perceived behavioral control, which was not captured by the latter (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). The primary difference between these two theories is that the former provides a holistic picture of the consumer's behavioral intentions and their decision to engage in purchasing behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). Undoubtedly, social scientists are grateful to Icek Ajzen, who first proposed the Theory of Planned Behavior and paved the way for future researchers to apply this new theory to different fields of study, such as health care, finance, accounting, and economics, to understand consumer behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). Several theories are developed by applying the Theory of Planned Behavior to different fields of study, and some of these theories are learning, attribution, and consistency theories.

The Theory of Reasoned Action argues that an individual's attitudes and subjective norms contribute to behavioral intentions that lead to actual behavior. It is argued in this study that the socioeconomic context faced by males and females justifies the differences in the borrowing behavior noted in a different geographical context (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). For example, disadvantaged women in low-income countries may intend to borrow due to their inability to meet the high cost of health care financing, but they may not be able to borrow as borrowers need to meet the financial requirements stipulated by the bank. As Zhang et al., (2020) and Narain (2009) argues, women are less likely to have access to formal financing channels than men. Drawing from Zhang and Narain's study, this study contends that there are significant differences in borrowing for health and medical purposes in certain geographical regions.

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With the introduction of perceived behavioral control as an important component used to assess an individual's behavior at any point in time, the propositions proposed by the Theory of Reasoned Action were challenged as Ajzen (1991) emphasized that the basic link between behavioral intention and actual behavior may not be present when individuals decide to exercise personal control. As an example, consumers may perceive that a credit card is one of the best facilities that they can use to borrow short-term finance for health and medical purposes, but with the recent increase in fraudulent activities involving credit cards, consumers may perceive it as a risky facility and may not use it for short-term finance. Drawing from Ajzen's work, this study argues that consumers from the disadvantaged socioeconomic background may use a credit card to mitigate unpredictable health care financing costs.

A Conceptual Model Linking Theory of Planned Behavior to Health, Gender Dimensions and Credit Card Ownership and Use: An Overview

As always, human behavior is complex, sophisticated, and difficult to understand, and out of natural curiosity, social scientists have undertaken numerous studies to understand human behavior (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). Due to the unpredictable nature of human behavior, predicting current and future events has always been difficult, but social scientists have not left their relentless quest to examine, scrutinize, and predict human behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). As an example, it is complex to explain the phenomenon of why people may use a credit card to borrow for health or medical purposes in some geographical regions, but credit cards may not be a trustworthy financial instrument in other geographical regions. Additionally, it is also complex to explain the gender disparity in using a credit card as a short-term financial instrument in different countries. This paper contends that the Theory of Planned Behavior can explain credit card use and ownership as it incorporates the factors associated with perceived behavioral control in explaining the intention to own and use credit cards.

Drawing from the Theory of Planned Behavior and applying this theory to this study, it can be argued that intentions may not always lead to actual behavior due to attributes related to perceived behavioral control influencing the intention to commit to the actual behavior (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). For instance, a credit card is a lucrative facility provided by financial institutions, and customers have a positive attitude towards the ownership and use of the credit card. One of the major advantages of owning a credit card is that it will act as a major financial backup and suffice immediate, short-term financial needs during needy times (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). However, this does not necessarily imply that customers who intend to own and use a credit card would initiate this behavior. Eventually, customers will be considering the risks associated with the ownership and use of credit cards. Financial institutions will consider the customer's financial background before deciding to approve the facility for credit card owners (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). Customers will have to encounter these hurdles before initiating and completing the final purchasing behavior and using credit cards to meet short-term immediate necessity financial needs (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). Figure one illustrates the two research questions proposed in this study by using the Theory of Planned Behavior.

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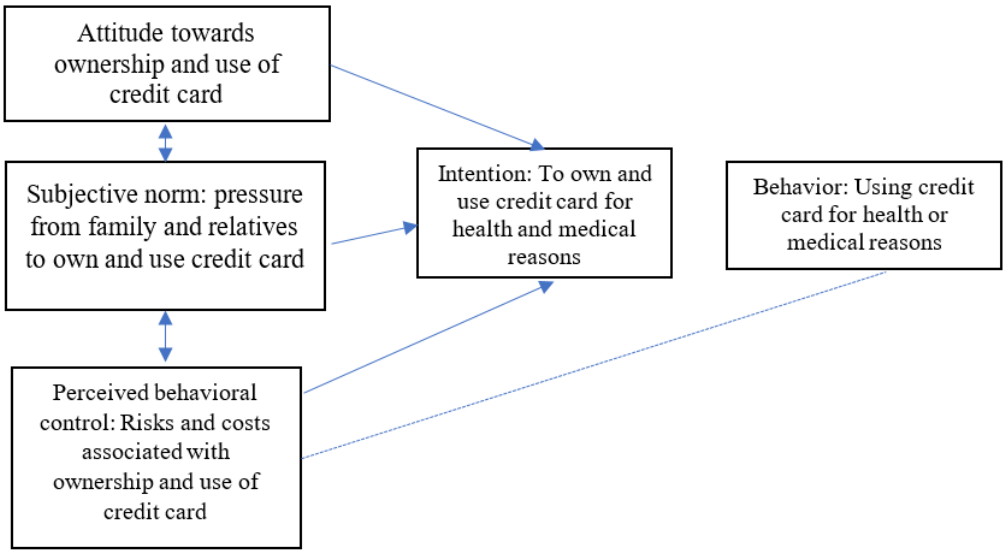

Figure 1. Integrating the Theory of Planned Behavior with Credit Card Use and Ownership
Source: Created by the authors (2019)

3. Literature Review

The household's monthly expenditure bill can be easily divided into expenditures on luxury and necessity (Getzen, 2000; Dorband et al., 2019). One of the most hotly debated topics in the extant literature is the household expenditure on necessities, as the households' ability to meet their monthly expenditure is of immense interest to academics, international stakeholders, and policymakers (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019). A close examination of the existing literature shows that households spend hundreds of dollars in health care expenditure, and most of the funding for this health care expenditure is channelled through the household's income. As Wagner et al. (2011) found that in low and middle-income countries, households spend 13%-32% of their total expenditure on health care. Essentially, it is noted in this study that in low-income countries, one out four households incurred high levels of health care expenses. Flores et al. (2008) argued that inpatient care is more than 10% of household expenditure for 30% of the inpatient care patients in the case of India. Only 4% of households sacrifice 10% of their current consumption to meet inpatient care's financial demands. Studies have also confirmed that there is uncertainty involved in predicting health expenditure because it is extremely difficult for households to determine future demands for healthcare financing. As Rodríguez (2021) pointed out, individuals' future health status is uncertain; therefore, current savings are driven by the people's perception of their health status in the future. People may keep a credit card when their income is insufficient to meet their health expenditures. Several studies have argued that there is a need for more sophisticated studies to examine people's borrowing behavior for health or medical reasons and the relationship between the borrowing behavior of people and ownership of financial instruments (Limbu & Sato, 2019; Jamshidi & Kazemi, 2019; Xiao et al., 2011; Yang et al., 2007). This study expands the existing literature by exploring two crucial research questions. The first research question explores how borrowing for health or medical reasons influences credit card use and ownership. The second research question explores the significant differences between borrowing for health or medical purposes by males and females (% age, 15 years and above).

Individuals and households may borrow due to several reasons, whereby most borrowing activities of households can be categorized as borrowing for necessity or borrowing for luxury. The intention and the household's actual borrowing behavior are determined by the availability of funds, interest rates paid on borrowed funds, and various

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forms of risk associated with borrowing (Wang et al., 2021; Aboelmaged, 2021; Holdsworth, 2020). This paper focuses on borrowing for health or medical purposes due to two reasons. Firstly, as Stuckler et al. (2011) argue, global health aid is currently being diverted towards areas of global importance, and this has resulted in the displacement of health care spending. Some of the factors that have led to the displacement of health spending are a high level of corruption and a lack of government commitment to enhance health services. This phenomenon has led to the bulging of the burden of healthcare costs faced by households and individuals. As Goulding et al. (2011) clearly emphasized in their study, due to the increase in healthcare costs, there has been an increase in the borrowing of medicines among young adults. Existing studies have identified that the number of problems has started increasing as the cost of health care coverage is becoming unmanageable for households and individuals (Yamey et al., 2019; Chu et al., 2019). This study explores how borrowing to manage the cost of health care coverage influences the ownership and use of credit cards. Secondly, this study contends that individuals' socioeconomic and demographic background may influence their borrowing behaviour for health and medical purposes. As O'Donnell and his colleagues found in their study, the population residing in rural areas is more likely to bear catastrophic healthcare expenditure, as they lack access to clean drinking water and a proper sewage system.

Several studies have argued that the sustainable approach is to improve sanitation, hygiene, and access to clean drinking water rather than saving for catastrophic health care payments in the future. Household consumption expenditure will increase as the household's catastrophic health care payment increases ((Yamey et al., 2019; Chu et al., 2019; O'Donnell et al., 2005). Similarly, Petersen et al. (2008) found that women of reproductive age are more likely to borrow medicine than women in other age groups. Cost is one of the main factors that drive the borrowing behaviour of reproductive-age women. Another study conducted by La Parra and Mateo (2008) confirmed that the British population residing in Costa Blanca had recorded better health than the Spaniards and British home population. One of the reasons attributed to this is that most British nationals residing in Costa Blanca are from either middle- or high-income groups rather than from low-income groups. Having substantial financial resources will help the British nationals living in Costa Blanca to access quality health services.

Several studies have confirmed that chronic health problems will increase the financial burden on households. Lyons and Yilmazer (2005) emphasized in their study that poor health of individuals will increase the financial hardship faced by the individuals, but it does not necessarily imply that it will lead to a decline in health status. Another study conducted by Chen et al. (2017) argued that students are faced with high levels of debt burden during their post-secondary education. This debt burden worsens when children cannot maintain a healthy lifestyle. Emanuel and Fuchs (2008) found that employers must fund worker's premiums and state funds for Children's Health Insurance program. One of the major consequences of the rising cost of healthcare, as argued by Ward et al. (2011), it is that people may borrow medicine to reduce costs, but this behaviour should be discouraged because it leads to adverse health outcomes. The rising cost of healthcare has become a growing concern, not only in developing countries but also in developed countries. Hosseini (2016) emphasized that there have been relentless efforts by government policymakers to develop sustainable and cost-effective healthcare models to reduce healthcare costs. Iran's health house health care model has been successful in providing customized healthcare in rural areas. The sustainable side of the model emphasizes reducing the healthcare cost burden faced by households. The incidence of catastrophic health care expenditure is reasonably higher, and people are struggling to meet these expenditures.

Emerging studies have emphasized several reasons why individuals may keep credit cards (Stavins, 2020). One of the reasons identified by Meier and Sprenger (2010) is that an individual's attitude towards borrowing, saving, and spending influences their decision to own and use credit cards. Meier and his colleague mentioned that present-biased individuals are more likely to engage in credit card borrowing and have high amounts of credit card debt than future biased individuals. Another reason identified by Xiao et al. (2005) is that older consumers with a secure retirement and a good family relationship are more likely to engage in positive credit card

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borrowing behaviours. Babiarz et al. (2013) found an increased likelihood of an increase in debt faced by uninsured households or having an insurance scheme that provides restrictive health coverage. Noerhidajati et al. (2021), Zinman (2009) found a strong relationship between credit card borrowing and households' financial conditions. Shrivastava et al. (2019) argued that when a family faces financial hardship, this can lead to stress and adversely impact mental wellbeing. With the growing importance and use of credit cards, several studies have emphasized the need to undertake responsible financial behaviour. Xiao et al. (2011) emphasized that the Credit Card Act of 2009 promotes and fosters responsibility for young adults to gather financial knowledge before undertaking responsible financial behaviour. The findings from this study showed that socioeconomic status affects the risky credit behaviour undertaken by the students. Yang et al. (2007) found that the more likely consumers are optimistic about future borrowing behaviour, the more likely they are to own a credit card. Some of the factors that drive future borrowing behaviour are the type of employment, the volatility of income, consumption expenditure, etc. The misuse of credit cards is becoming a growing problem in the US, with college students engaging in irresponsible financial behaviour while using their credit cards. Robb (2011) explored the relationship between financial knowledge and the credit card use behaviour of college students in the US. The findings from this study confirmed that financial knowledge significantly influences the credit card decisions of college students. Himmelstein et al. (2009) study based on bankruptcy filers found that 62.1% of the US's bankruptcy filed in the year 2001 was for medical reasons. According to Yamey et al. (2019), Chu et al., (2019), and Jacoby et al. (2001), thousands of families are devastated each year due to the high cost of health care financing. Some authors have argued that health insurance can be a solution to the problem, but there are existing studies that have confirmed that filing for bankruptcy is another possible solution to this problem.

4. Research Methodology

The data for this study was collected from the Global Findex database, which is the world's biggest database on borrowing, saving, and managing risk. This database was launched by the Bill and Melinda Gates Foundation in the year 2011, and it updates its online database of financial indicators every three years. Gallup Corporation plays an essential role in the collection of data from 150,000 adults, and this data is collected for 140 economies. The Global Findex database houses data on 200 indicators, with outputs available in Stata and Excel that allow ease of download and access of data. Most of the data collected for the variables used in this study were via a Likert scale and a dichotomous scale. As per the database, data on borrowing for medical and health purposes, credit card use, and ownership was collected for the following indicators:

1. Borrowing for health or medical purposes (% age 15+)
2. Borrowing for health or medical purposes, male (% age 15+)
3. Borrowing for health or medical purposes in labor force (% age 15+)
4. Borrowing for health or medical purposes, out of labor force (% age 15+)
5. Borrowing for health or medical purposes, female (% age 15+)
6. Borrowing for health or medical purposes, young adults (% age 15-24)
7. Borrowed for health or medical purposes, older adults (% age 25+)
8. Borrowing for health or medical purposes, primary education or less (% age 15+)
9. Borrowed for health or medical purposes, secondary education or more (% age 15+)
10. Borrowing for health or medical purposes, income poorest 40% (% age 15+)
11. Borrowing for health or medical purposes, income, the richest 60% (% age 15+)
12. Borrowing for health or medical purposes, rural (% age 15+)
13. Credit card ownership (% age 15+)
14. Credit cards used in the past year (% age 15+)

Drawing from the Global Findex database, data were collected and analyzed by using the Excel software for the following developed and developing countries.

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Table 1. Developed and Developing Countries

#	Developed Countries	Developing Countries
1	United Arab Emirates	Afghanistan
2	Australia	Burundi
3	Austria	Benin
4	Belgium	Burkina Faso
5	Bahrain	Central African Republic
6	Canada	Congo
7	Switzerland	Comoros
8	Chile	Ethiopia
9	Cyprus	Guinea
10	Czech Republic	Haiti
11	Germany	Liberia
12	Denmark	Madagascar
13	Spain	Mali
14	Estonia	Mozambique
15	Finland	Malawi
16	France	Niger
17	United Kingdom	Nepal
18	Greece	Rwanda
19	Hong Kong SAR China	Senegal
20	Hungary	Sierra Leone
21	Ireland	Somalia
22	Israel	South Sudan
23	Italy	Chad
24	Japan	Togo
25	Korea	Tanzania
26	Kuwait	Uganda
27	Lithuania	Zimbabwe
28	Luxembourg	
29	Latvia	
30	Malta	
31	Netherlands	
32	Norway	
33	New Zealand	
34	Oman	
35	Poland	
36	Puerto Rico	
37	Portugal	
38	Qatar	
39	Saudi Arabia	
40	Singapore	
41	Slovak Republic	
42	Slovenia	
43	Sweden	
44	Trinidad and Tobago	
45	Taiwan, China	
46	Uruguay	
47	United States	

Source: Created by the Authors

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5. Research findings

To determine the mean differences in borrowing for health and medical purposes in the context of high and low-income countries, we used the mean percentage for comparison between high income and low-income countries. The comparison of the mean percentage shows that individuals in high-income countries are less likely to borrow compared to individuals in low-income countries for health or medical purposes. In comparison to the different cohorts, the poorest 40% of the population in the high-income countries are more likely to borrow than other cohorts of the population group. On the other hand, in the case of low-income countries, individuals in the labor force above the age of 15 years are more likely to borrow compared to other cohorts (see Table two). Individuals in high-income countries are more likely to own and use the credit card compared to individuals in low-income countries.

Table 2. Summary Statistics for High-Income Countries and Low-Income Countries

High-Income Countries														
	Variable Numbers													
Descriptive Statistics	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Mean	0.047	0.047	0.050	0.041	0.046	0.042	0.048	0.051	0.047	0.063	0.037	0.051	0.421	0.371
Standard Error	0.003	0.003	0.004	0.003	0.003	0.004	0.003	0.005	0.003	0.004	0.003	0.004	0.016	0.019
Median	0.040	0.040	0.040	0.035	0.040	0.030	0.040	0.040	0.040	0.055	0.030	0.040	0.420	0.360
Mode	0.020	0.020	0.040	0.050	0.010	0.000	0.020	0.030	0.030	0.040	0.020	0.040	0.170	0.200
Standard Deviation	0.031	0.032	0.037	0.027	0.031	0.039	0.032	0.045	0.032	0.041	0.028	0.036	0.186	0.182
Sample Variance	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.001	0.035	0.033
Kurtosis	0.954	1.168	1.460	-0.083	1.506	0.783	0.621	1.739	0.964	-0.212	3.127	0.819	-1.025	-0.818
Skewness	1.029	1.153	1.268	0.685	0.951	1.091	0.998	1.331	1.085	0.717	1.564	0.965	0.098	0.246
Range	0.140	0.160	0.170	0.120	0.170	0.170	0.140	0.210	0.150	0.160	0.140	0.160	0.730	0.720
Minimum	0.010	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.010	0.010	0.000	0.000	0.100	0.070
Maximum	0.150	0.160	0.170	0.120	0.170	0.170	0.150	0.210	0.160	0.170	0.140	0.160	0.830	0.790
Sum	4.110	4.170	4.280	3.560	4.070	3.720	4.220	4.480	4.150	5.510	3.230	4.410	55.590	32.680
Count	88	88	86	86	88	88	88	88	88	88	88	87	132	88
Low Income Countries														
	Variable Numbers													
Descriptive Statistics	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
Mean	0.191	0.191	0.210	0.148	0.190	0.165	0.206	0.198	0.175	0.196	0.185	0.196	0.019	N/A
Standard Error	0.011	0.011	0.012	0.008	0.011	0.011	0.012	0.011	0.011	0.011	0.011	0.012	0.002	N/A
Median	0.180	0.180	0.200	0.150	0.180	0.150	0.200	0.180	0.170	0.180	0.180	0.180	0.010	N/A
Mode	0.100	0.090	0.170	0.170	0.260	0.110	0.110	0.100	0.160	0.130	0.160	0.180	0.010	N/A
Standard Deviation	0.072	0.074	0.081	0.055	0.075	0.074	0.079	0.077	0.077	0.076	0.075	0.078	0.018	N/A
Sample Variance	0.005	0.005	0.007	0.003	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.000	N/A
Kurtosis	-0.361	-0.724	-0.108	-0.841	0.001	0.440	-0.669	-0.573	0.076	0.215	-0.218	-0.632	3.387	N/A
Skewness	0.463	0.371	0.492	0.124	0.596	0.802	0.346	0.445	0.481	0.715	0.456	0.485	1.818	N/A
Range	0.300	0.280	0.360	0.210	0.330	0.330	0.320	0.310	0.350	0.330	0.330	0.300	0.090	N/A
Minimum	0.090	0.090	0.080	0.050	0.080	0.040	0.090	0.090	0.030	0.090	0.050	0.090	0.000	N/A
Maximum	0.390	0.370	0.440	0.260	0.410	0.370	0.410	0.400	0.380	0.420	0.380	0.390	0.090	N/A
Sum	46	46	46	46	46	46	46	46	46	45	45	46	69	N/A

Variable Code:
1 represents borrowing for health or medical purposes (% age 15+)
2 represents borrowing for health or medical purposes, male (% age 15+)
3 represents borrowing for health or medical purposes in labor force (% age 15+)
4 represents borrowing for health or medical purposes, out of labor force (% age 15+)
5 represents borrowing for health or medical purposes, female (% age 15+)
6 represents borrowing for health or medical purposes, young adults (% age 15-24)
7 represents borrowing for health or medical purposes, older adults (% age 25+)
8 represents borrowing for health or medical purposes, primary education or less (% age 15+)
9 represents borrowing for health or medical purposes, secondary education or more (% age 15+)
10 represents borrowing for health or medical purposes, income poorest 40% (% age 15+)
11 represents borrowing for health or medical purposes, income, richest 60% (% age 15+)
12 represents borrowing for health or medical purposes, rural (% age 15+)
13 represents Credit card ownership (% age 15+)
14 represents Credit card used in the past year (% age 15+)
N/A represents not applicable

Source: Created by the Authors

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To determine the correlation between borrowing for health or medical purposes and credit card use and ownership, correlation coefficients were determined for each of the variables. The findings show that there is a negative correlation between borrowing for health or medical purposes and credit card use or ownership (see Table 3).

Table 3. Correlation of Borrowing for Health Purposes, Credit Card Ownership and Usage

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1	1.000													
2	0.986**	1.000												
3	0.994**	0.984**	1.000											
4	0.935**	0.914**	0.905**	1.000										
5	0.987**	0.950**	0.979**	0.936**	1.000									
6	0.913**	0.907**	0.908**	0.847**	0.900**	1.000								
7	0.990**	0.974**	0.987**	0.928**	0.979**	0.858**	1.000							
8	0.942**	0.931**	0.936**	0.868**	0.925**	0.838**	0.941**	1.000						
9	0.955**	0.957**	0.953**	0.893**	0.930**	0.897**	0.935**	0.874**	1.000					
10	0.967**	0.940**	0.961**	0.906**	0.965**	0.892**	0.956**	0.915**	0.902**	1.000				
1	0.984**	0.983**	0.981**	0.922**	0.964**	0.891**	0.978**	0.922**	0.953**	0.911**	1.000			
12	0.986**	0.975**	0.982**	0.919**	0.974**	0.899**	0.979**	0.939**	0.936**	0.962**	0.969**	1.000		
13	-0.699**	-0.694**	-0.701**	-0.674**	-0.692**	-0.588**	-0.708**	-0.628**	-0.661**	-0.657**	-0.699**	-0.680**	1.000	
14	-0.250*	-0.252*	-0.286**	-0.177	-0.253*	-0.014	-0.298**	-0.024	-0.253*	-0.193	-0.288**	-0.210	0.986**	1.000

Variable Code:
1 represents borrowing for health or medical purposes (% age 15+)
2 represents borrowing for health or medical purposes, male (% age 15+)
3 represents borrowing for health or medical purposes in labor force (% age 15+)
4 represents borrowing for health or medical purposes, out of labor force (% age 15+)
5 represents borrowing for health or medical purposes, female (% age 15+)
6 represents borrowing for health or medical purposes, young adults (% age 15-24)
7 represents borrowing for health or medical purposes, older adults (% age 25+)
8 represents borrowing for health or medical purposes, primary education or less (% age 15+)
9 represents borrowing for health or medical purposes, secondary education or more (% age 15+)
10 represents borrowing for health or medical purposes, income poorest 40% (% age 15+)
11 represents borrowing for health or medical purposes, income, richest 60% (% age 15+)
12 represents borrowing for health or medical purposes, rural (% age 15+)
13 represents Credit card ownership (% age 15+)
14 represents Credit card used in the past year (% age 15+)
N/A represents not applicable
Note:
**Correlation is significant at the 0.01 level (2 tailed)
* Correlation is significant at the 0.05 level (2 tailed)

Source: Created by the Authors

Table four shows that there are significant differences between borrowing for health or medical reasons between males and females in Austria and Lithuania. Similarly, the significant difference between borrowing for health or medical reasons between males and females was found in the case of Madagascar and Nepal.

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Table 4. Paired Sample t-test for Means Exploring the Significant Difference Between Borrowing for Health or Medical Purposes by Males and Females (% age, 15+)

Country	Category	T-Statistics	P(T<=t) one-tail	P(T<=t) two-tail
United Arab Emirates	High Income	3.667	0.084	0.170
Australia	High Income	-0.600	0.328	0.656
Austria	High Income	7.000	0.045*	0.090
Bahrain	High Income	2.500	0.121	0.242
Canada	High Income	1.000	0.250	0.500
Switzerland	High Income	0.000	0.500	1.000
Cyprus	High Income	1.000	0.500	1.000
Czech Republic	High Income	1.000	0.250	0.500
Denmark	High Income	-3.000	0.102	0.205
Spain	High Income	-0.333	0.398	0.795
Estonia	High Income	-1.000	0.250	0.500
Finland	High Income	1.000	0.250	0.500
France	High Income	-0.333	0.398	0.795
United Kingdom	High Income	3.000	0.102	0.205
Greece	High Income	-0.200	0.437	0.874
Hong Kong SAR, China	High Income	3.000	0.102	0.205
Hungary	High Income	-1.000	0.250	0.500
Ireland	High Income	-3.000	0.102	0.205
Israel	High Income	-1.000	0.250	0.500
Italy	High Income	-0.500	0.352	0.704
Japan	High Income	1.000	0.250	0.500
Korea, Rep.	High Income	-0.500	0.352	0.705
Lithuania	High Income	-7.000	0.045*	0.090
Luxembourg	High Income	-3.000	0.102	0.205
Latvia	High Income	-0.500	0.352	0.705
Malta	High Income	-1.000	0.250	0.500
Netherlands	High Income	1.000	0.250	0.500
New Zealand	High Income	-1.000	0.250	0.500
Poland	High Income	0.600	0.328	0.656
Portugal	High Income	0.333	0.398	0.795
Saudi Arabia	High Income	1.000	0.250	0.500
Singapore	High Income	1.000	0.250	0.500
Slovenia	High Income	-0.333	0.398	0.795
Slovak Republic	High Income	1.000	0.250	0.500
Sweden	High Income	0.333	0.398	0.795
Uruguay	High Income	-5.000	0.063	0.126
United States	High Income	1.000	0.250	0.500
Afghanistan	Low Income	2.500	0.121	0.242
Burkina Faso	Low Income	0.556	0.339	0.677
Congo	Low Income	-0.200	0.437	0.874
Chad	Low Income	0.500	0.352	0.705
Guinea	Low Income	-5.000	0.062	0.126
Haiti	Low Income	-1.500	0.187	0.374
Mali	Low Income	-6.9E-16	0.500	1.000
Madagascar	Low Income	7.000	0.045*	0.090
Malawi	Low Income	-1.667	0.172	0.344
Niger	Low Income	1.667	0.172	0.344
Nepal	Low Income	-7.000	0.045*	0.090
Rwanda	Low Income	-0.600	0.328	0.656
Senegal	Low Income	-1.4E-15	0.500	1.000
Sierra Leone	Low Income	0.667	0.313	0.626
Tanzania	Low Income	1.000	0.250	0.500
Togo	Low Income	-0.333	0.398	0.795
Uganda	Low Income	-0.333	0.398	0.795
Zimbabwe	Low Income	-3.000	0.102	0.205

Note: *p < 0.05 ** p < 0.01 ***p <0.001

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Table 5 presents the estimated regression parameters for predicting credit card ownership in high-income countries and low-income countries. In the case of high-income countries, borrowing for health or medical purposes, primary education or less (% age 15+) had a significant impact on credit card ownership, whereas, in the case of low-income countries, no significant results were noted.

Table 5. Estimated Regression Parameters for Predicting Credit Card Ownership in the High-Income Countries and Low-Income Countries

Variables	**Model 1**	**Model 2**
	b(SE)	**b(SE)**
Borrowing for health or medical purposes, male (% age 15+)	-3.50 (3.75)	-0.99(0.73)
Borrowing for health or medical purposes in labor force (% age 15+)	-3.73 (3.77)	0.51(0.42)
Borrowing for health or medical purposes, out of labor force (% age 15+)	-0.70 (2.09)	0.22(0.14)
Borrowing for health or medical purposes, female (% age 15+)	-3.63 (3.74)	-0.67(0.73)
Borrowing for health or medical purposes, older adults (% age 25+	-7.02 (6.04)	-0.58(0.74)
Borrowing for health or medical purposes, young adults (% age 15-24)	0.31 (1.32)	-0.003(0.401)
Borrowing for health or medical purposes, primary education or less (% age 15+)	1.28 (0.66)*	0.22(0.26)
Borrowing for health or medical purposes, secondary education or more (% age 15+)	8.20 (4.41)	0.03(0.10)
Borrowing for health or medical purposes, income poorest 40% (% age 15+)	0.211(3.84)	1.23(0.78)
Borrowing for health or medical purposes, income, richest 60% (% age 15+)	-0.257 (5.50)	0.57(0.51)
Borrowing for health or medical purposes, rural (% age 15+)	0.63 (1.46)	0.07(0.28)
Borrowing for health or medical purposes (% age 15+)	6.33 (6.74)	-0.60(1.10)
C	0.52 (0.04)	0.03(0.009)
Note: *p < 0.05 ** p < 0.01 ***p <0.001		

Source: Created by the Authors

Table 6 presents the estimated regression parameters for predicting credit card usage in high-income countries. In the case of high-income countries, borrowing for health or medical purposes, primary education or less (% age 15+) had a significant impact on credit card use. Data on low-income countries were not available, so the regression results could not be undertaken for low-income countries.

Table 6. Estimated Regression Parameters for Predicting Credit Card Usage in the High-Income Countries

Variables	**Model 1**
	b(SE)
Borrowing for health or medical purposes, male (% age 15+)	-3.54(3.64)
Borrowing for health or medical purposes in labor force (% age 15+)	-3.39(3.66)
Borrowing for health or medical purposes, out of labor force (% age 15+)	-0.42(2.03)
Borrowing for health or medical purposes, female (% age 15+)	-8.27(5.63)
Borrowing for health or medical purposes, older adults (% age 25+	-0.58(0.74)
Borrowing for health or medical purposes, young adults (% age 15-24)	-0.05(1.29)
Borrowing for health or medical purposes, primary education or less (% age 15+)	1.37(0.64)*
Borrowing for health or medical purposes, secondary education or more (% age 15+)	8.13(4.29)
Borrowing for health or medical purposes, income poorest 40% (% age 15+)	0.61(3.72)
Borrowing for health or medical purposes, income, richest 60% (% age 15+)	-0.28(5.34)
Borrowing for health or medical purposes, rural (% age 15+)	1.11(1.41)
Borrowing for health or medical purposes (% age 15+)	6.62(6.54)
C	0.43(0.04)
Note: *p < 0.05 ** p < 0.01 ***p <0.001	

Source: Created by the Authors

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6. Discussions

The existing studies on borrowing for health or medical reasons have explored several issues, and most of the issues that have been explored are the rising cost of healthcare (Wagner et al., 2011), the burden of healthcare expenditure and the reasons why individuals keep the credit cards (Xiao et al., 2011; Yang et al., 2007). The literature review section has emphasized the need for existing studies to explore how borrowing for health or medical reasons influences credit card use and ownership. Additionally, the review of the literature has also underlined that there is a need for existing studies to explore significant differences between borrowing for health or medical purposes by males and females.

The findings from this study showed that the highest mean value for borrowing for health or medical purposes was recorded for the poorest 40% of the population group in the case of high-income countries. Comparing this evidence to the context of low-income countries, individuals in the labour force above the age of 15 years recorded the highest percentage of borrowing for health or medical purposes. Intuitively, this research finding is parallel to the phenomenon present in high-income and low-income countries. Most of the high-income countries have well-developed financial markets, coupled with a greater percentage of the population having access to financial markets, and it can be argued that individuals and households are more likely to rely on credit cards to meet their short-term financing needs for health and medical purposes. In contrast to the phenomenon present in high-income countries, the per capita income of low-income countries is lower than the per capita income of high-income countries. This implies that the individuals and households in low-income countries are more likely to face financial hardship associated with managing health care costs due to the high cost of health care coverage and lack of financial budget available to the household. Rather than the greater likelihood of the poor cohort borrowing in the case of high-income countries, a working population who are easily able to meet the financial requirements of financial institutions are more likely to borrow for health or medical purposes.

Additionally, our research findings also indicate that there is a strong positive correlation between credit card ownership (% age 15+) and credit cards used in the past year (% age 15+). This indicates that as the credit card ownership increases (% age 15+), the likelihood of credit cards used in the past year will also increase (% age 15+). This research finding is consistent with the broader studies conducted by Meier and Sprenger (2010), Xiao et al. (2005), Babiarz et al. (2013), and Zinman (2009).

Our results also show that there are significant differences between borrowing for health or medical reasons between males and females in Austria and Lithuania. Both Austria and Lithuania are high-income countries, but in the case of low-income countries, significant gender differences were found in Madagascar and Nepal. While comprising the borrowing behaviour of males and females in Austria and Lithuania, it was found that a greater percentage of males borrowed for health or medical reasons in Austria, whereas in the case of Lithuania, a greater percentage of females borrowed for health or medical reasons. The differences in the borrowing behaviour of males and females in the two highest income countries can be easily linked to the health care model present in the two countries (Schumacher and Zechmeister, 2013; London School of Economics and Political Science, 2017). Austria has a two-tier health care system, whereby everyone is covered under the publicly funded health care system, but individuals and households also buy private insurance health care schemes to access flexible healthcare services. Households may also borrow to pay for health care completely privately. Males are more likely to borrow for health or medical reasons, as 75% of males compared to 68% of females are employed in Austria (OECD, 2019). Lithuania has a modern state-funded health care system, whereby public spending on the healthcare system grew rapidly in the early 2000s. The Global Economic Crisis had a major negative impact on the health care system, leading to an unprecedented increase in the out-of-pocket increase of health care payments. Unlike numerous other countries around the world, women's health in Lithuania is much better than men's, and this explains the high percentage of borrowing for health or medical purposes by women (Purvaneckienò, 2019; World Health Organization, 2018). The health care system of Nepal is much better than

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the healthcare system of Madagascar, as the health reforms in Nepal have improved the accessibility and delivery of the healthcare system. With greater accessibility of healthcare services, women in Nepal can borrow more than men, but in Madagascar, men are able to borrow more than women because women are less financially inclusive compared to men (Ministry of Health and Population, 2010).

The findings from this study also showed that borrowing for health or medical purposes, primary education or less (% age 15+) had a statistically significant impact on credit card ownership and usage in high-income countries. There was no statistically significant relationship found between borrowing for health or medical purposes and credit card usage and ownership in low-income countries. There are two reasons for the presence of this relationship in high and low-income countries. Firstly, individuals with primary education or less may not be able to meet the rising cost of healthcare, as most individuals in this category have low income. This implies that they may use credit cards for short-term health financing needs. Secondly, in low-income countries, individuals may not be able to easily meet the requirements and undertake risks for holding credit cards. As a result, it is less likely that borrowing for health or medical purposes has a significant impact on credit card use and ownership.

The research findings from this study are theoretically consistent, as the regression results indicate that in high-income countries, individuals have better access to the financial facilities provided by the bank and non-bank financial institutions. In these high-income countries, individuals whose income is insufficient to meet the rising cost of healthcare may have the intention to own and use credit cards for health or medical purposes. This intention would lead to the actual behaviour of using credit cards for health or medical reasons. Consistent with the Theory of Planned Behavior on credit card use and ownership, individuals in low-income countries may not meet the requirements of owning and using the credit cards stipulated by the bank and non-bank financial institutions. There are risks and costs associated with owning and using credit cards, and these risks can be mitigated if individuals and households have sufficient cash flows to meet the fee requirements of holding and using credit cards.

7. Scientific Novelty and Practical Value

This study's findings have practical and scientific value for health care service providers, government policymakers, and users of health services. According to SDG 3, healthcare, and the wellbeing of everyone can be improved by putting an end to epidemics and infectious diseases (Rokicki *et al*., 2021; Fryatt & Bhuwanee, 2017). This requires universal health coverage that is a critical component of sustainable development and reduces social inequities. The findings from this study confirm that financial innovations, such as credit cards, provides individuals and households in high-income countries with short-term financing needs for health and medical purposes. Unfortunately, individuals in low-income countries cannot benefit from credit card financing as most of them do not own credit cards. Importantly, the SDG on universal health coverage can only be achieved if policymakers and health care providers integrate financial innovations with the delivery of health services.

8. Conclusion, Limitations and Directions for Future Research

To conclude, this study achieved its aim by exploring the relationship between borrowing for health or medical purposes and credit card use and ownership. The findings from this study confirmed that there is a strong positive correlation between credit card ownership (% age 15+) and credit cards used in the past year (% age 15+). Additionally, this study also found that borrowing for health or medical purposes, primary education or less (% age 15+) had a statistically significant impact on credit card ownership and usage in high-income

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countries. There was no statistically significant relationship found between borrowing for health or medical purposes and credit card usage and ownership in low-income countries. The findings from this study are consistent with the propositions of the Theory of Planned Behavior and the limitations of this study as a guideline for designing future research studies.

There are a couple of limitations of this study, and these limitations can be easily addressed by future studies on borrowing for health or medical purposes and ownership and use of credit cards. This study is based on a sample of 74 countries, which implies that the generalizations from this study are limited only to higher income and low-income countries. The investigation of the two research questions proposed in this study by using data from lower middle income and upper-middle-income countries would expand this study. This is both a cross-sectional and time-series study that can be easily extended by collecting data for a 30 years period. Unfortunately, data of such nature are only provided for a limited period in the Global Findex database. Future researchers can contribute to the literature by collecting data from alternative databases that provide proxies for measuring borrowing for health or medical purposes for a 30-year period.

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