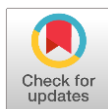



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- Author (s):** Maria Iftikhar, Hina Ali, and Nazish Iftikhar
- Affiliation (s):** The Women University Multan, Pakistan
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Department of Economics and Statistics, Dr. Hasan Murad School of Management
University of Management and Technology, Lahore, Pakistan

Analyzing the Nutritional Impact of CVDs, Cancer, and Diabetes on Mortality in Developing Economies

Maria Iftikhar , Hina Ali* , and Nazish Iftikhar 

Department of Economics, The Women University Multan, Pakistan

Abstract

The current study aimed to analyze the nutritional impact of cardiovascular diseases (CVDs), cancer, and diabetes on mortality in developing economies. This was done by using the data collected from World Development Indicators (WDI) for the time period (2009-2023). Panel data analysis was used to uncover different nutritional factors that impact mortality caused by CVDs, cancer, and diabetes in 23 developing economies. For data estimation, this study employed the unit root test, cointegration test, cross-sectional test, static panel model, and Panel Corrected Standard Error (PCSEs) model. The panel unit root test and cointegration test ensured that all variables are stationary and long-run relationships exist among all variables in the panel model. The overall panel regression result of the Expenditure on Current Healthcare (CHE), Education on Public Spending (PSE), Secure Drinking Water (SDW), and Improved Sanitation Practices (SMS), showed a negative and significant impact on mortality caused by CVDs, cancer, and diabetes. Furthermore, the prevalence of hypertension and undernutrition had a positive and significant impact on the ratio of mortality from CVDs, cancer, and diabetes. The study also suggested recommendations for policy options and innovative solutions. These might improve the nutritional status and also promote healthy behavior that protects communities from chronic diseases and epidemics in developing economies.

Keywords: cancer, developing economies, diabetes, mortality from cardiovascular diseases, nutrition, static panel model

Introduction

The primary motive of policies pertaining to public health is to protect, reinstate, and promote community life by using curable medicines that prevent diseases and increase the knowledge of health education. It also raises awareness about life-threatening diseases and useful methods to

*Corresponding Author: hinaali@wum.edu.pk

contain these diseases, as well as protect the community. Furthermore, public health promotes protection from environmental pollution and strategic environmental protection policies to save human lives and improve access to clean water supply and sanitation services globally (Budreviciute et al., [2020](#); Kundu & Chakraborty, [2023](#); Sharma & Ganguly, [2018](#); Steel et al., [2025](#)).

People are more likely to receive better nutritious food and improved health services, if their standard of living is good along with financial stability. Furthermore, every person in society has an easy access to almost all services. Therefore, the practice of good administrative health system policies may cover all health-related problems in the upcoming years. In poor developing regions, communities barely have any resources to cover their health-related problems. Hence, the interference of governmental or non-governmental organizations is beneficial for healthy populations (Ahmad et al., [2023](#); Becker et al., [2022](#); Gianfredi et al., [2025](#)).

The major achievement regarding public health offers simple access to high-quality water and sanitation services, healthier excellent-quality foods that cover nutritional needs of the public, and effective vaccinations to protect the population from chronic diseases. A healthy environment protects communities from infectious diseases and reduces deaths caused by malaria, cholera, malnutrition, respiratory diseases, heart attacks, cancer, obesity, and diseases of the eyes. Proper solid and hospital waste management systems are helpful in decreasing the pollution, sickness rates, as well as maternity and communicable and non-communicable diseases. This promotes health among individuals and communities worldwide (Estill et al., [2021](#); He et al., [2024](#); Khan et al., [2024](#); Wolf et al., [2023](#); Zhang et al., [2022](#)).

The global health targets are categorized into four sections. The first section comprises the framework of the World Health Organization (WHO). This section is focused at promoting awareness in all developing countries in an appropriate way to implement successful programs in order to reduce the risk of tobacco control. The second section promotes the level of grants for the development and research in the fields of medicines and vaccines. This leads towards decreasing the risk of communicable and non-communicable diseases in developing countries. The third section is aimed at improving the health financing services as well as promoting an efficient workforce in developing countries through training and development

programs. This may increase the health status of families, especially in lower-income economies. The final section includes efficient techniques that increase the capacity of all developing countries. This might improve healthcare services and decrease the number of diseases and uncertainty in the field of management at the national and global levels. The estimated cost to perform all these tasks is more than average to obtain good results, both at the national and global levels, to improve health sustainability in the lower islands of developing countries (Ionescu et al., [2020](#); Jiang et al., [2023](#); World Health Organization, [2023](#), [2024](#)). So, the main objective of this study was to analyze the nutritional impact of cardiovascular diseases (CVDs), cancer, and diabetes on mortality in developing economies.

Literature Review

This portion provides the empirical evidence and covers the data conceptually. Moreover, it also examines the different nutritional factors that impact mortality caused by CVDs, cancer, and diabetes in developing economies.

Budreviciute et al. ([2020](#)) examined different factors that are responsible for higher rate of maternal mortality and non-communicable diseases. It is a worldwide phenomenon and societal issue for national and international governments of different countries. The study showed that different sociodemographic factors, such as self-management, genetics, environment, and medical condition variables are the primary causes of risk factors for noncommunicable diseases. Healthy food plays an important role in risk management and preventative measures against non-communicable diseases at all stages of life. In nutrition, interventions play a critical role in controlling the risk of non-communicable diseases. Various well-known prevention techniques that highlight the reduction of non-communicable diseases and their risk factors emphasize how to reduce these diseases and increase the health outcomes of well-being. Therefore, the effective prevention techniques that play a vital role include dietary adjustments and increased physical activity of humans. Moreover, these techniques also include quitting the habits of smoking and better managing the metabolic problems (He et al., [2024](#)).

Malakoane et al. ([2020](#)) examined the role of public health and policies that strengthen the performance of the public health system by implementing plans, policies, and strategies in African countries. The study

showed that increasing burden of diseases reduces public health program performance, resulting in sluggish development outcomes. Using data from 44 reports issued in 2013, a multi-method approach was applied. African nations face weak public health systems, staff shortages, funding difficulties, and poor management. Effective policies are needed to strengthen healthcare systems and address human and financial resource constraints.

Menne et al. (2020) examined the health and human well-being status of fifty-three European countries. The purpose of the study was to measure the political and institutional framework of communities and their role in increasing health activities. Qualitative methods, such as E4A can be employed to forecast health conditions in European countries. The E4A method is based on evidence-based actions to assess health status. In the European community, political and institutional strength is higher in high-income countries compared to developing ones, where systems are weaker. Limited access and power reduce health outcomes. Proper rules and merit-based policies are needed to improve health development in poorer European nations.

Strong et al. (2020) examined better health outcomes for all nations that depend on the Sustainable Development Goals (SDGs) and their targets. This was aimed at helping the nations to achieve health development goals and track progress towards 2030 targets and accountability for national plans. Seven health indicators showed progress in outcomes. Open data and national discussions support estimation. Bayesian models were used for analysis. The results showed progress in UN countries over ten years, with reduced maternal and child mortality, infectious and noncommunicable diseases, as well as improved family planning access in lower-income economies.

Heidkamp et al. (2021) investigated diseases associated with undernutrition, including malnutrition, underweight, stunting, and micronutrient deficiencies. The evidence of this study showed the effective interventions and continuing process of growing political commitment and investment of financial sectors in these departments. The nutritional deficiencies in millions of women, children, and adolescents worldwide remained the same according to the reports of the world health assembly nutrition targets of 2025 and the health agenda of 2030 goals of development sustainability. The final outline of this study reestablished and

implemented the interest of policymakers to increase the funding in both local and international departments. Furthermore, critical steps should be taken as well as effective policies and interventions are needed to fulfill the nutritional deficiencies.

Brazeau et al. (2022) evaluated community activities to improve public health. Focus group research was conducted to determine the health condition of countries. To assess the health status in developed and emerging nations, qualitative research was conducted. The findings of the study revealed that cultures that improve family health confront significant political and financial challenges. Developed countries face fewer political and financial hurdles. This is because their policies are more relaxed as compared to lower income countries. So, their health score ratio is considerably lower than that of the developed countries.

Henderson and Loreau (2023) examined the importance of development sustainability to create a better future. The main objective was to unite nations to address global issues, meet population needs, improve environmental quality, and reduce air pollution. The UN has set 17 SDGs to address current and future challenges. The study showed that no single goal can support the current population and resource use. High consumption reduces future resources. Preserving natural and agricultural land per person is essential for environmental sustainability and human well-being for a better future.

Yang et al. (2023) examined the environmental and climate change effects on health outcomes. Moreover, it was also measured how these changes affect other targets of health sustainability. Furthermore, this study also measured the increase in solid waste management services and their negative impact on climate change. Circular economy techniques reduce waste, improve air and water quality, enhance energy use, land use, food production, and health outcomes. Few businesses set climate targets and use circular economy to reduce waste, improve energy use, and air quality (Braithwaite et al., 2024).

Gianfredi et al. (2025) examined the global population ageing driven by increased life expectancy and declining mortality rates. The study showed the rising burden of chronic diseases, multimorbidity, and healthcare costs associated with ageing populations. This study also emphasized healthy ageing through prevention, proper nutrition, and physical activity to

maintain functional ability. Furthermore, this study recommended integrating public health policies and multidisciplinary care systems to ensure that longer life expectancy is accompanied by improved quality of life and sustainable healthcare systems (Steel et al., [2025](#)).

Therefore, the existing literature indicates that mortality from major non-communicable diseases is strongly influenced by health expenditure, education, and public health conditions. Higher healthcare spending and education reduce mortality by improving access, awareness, and prevention (Figuroa et al., [2023](#); He et al., [2024](#); Kundu & Chakraborty, [2023](#); Pham et al., [2023](#)). In contrast, hypertension and undernourishment tend to increase the mortality risk due to higher burden of diseases (Adeyeye et al. [2023](#); Andersson et al., [2023](#); Jiang et al., [2023](#); Jin et al., [2024](#)). Access to safe water and sanitation lowers mortality rate by reducing infections and improving the overall health outcomes (Wolf et al., [2023](#); World Health Organization, [2024](#)). Overall, these factors jointly explain variations in mortality caused by CVDs, cancer, and diabetes across countries.

The current study focused to estimate the many nutritional components, such as healthcare spending, education, hypertension prevalence, undernourishments, easy access to clean drinking water, and Improved Sanitation Practices (SMS) that influence on mortality caused by CVDs, cancer, and diabetes in developing economies. So, the current study aimed to explore these nutritional factors that impact mortality caused by CVDs, cancer, and diabetes in developing economies.

Research Methodology

This study aimed to explore the nutritional factors that influence mortality caused by CVDs, cancer, and diabetes in developing economies from selected developing countries for the time period 2009-2023. Table one provides a summary of the all variables that this study examined.

Table 1

Description of the Data

Variables	Definition	Sign	Measurement
MCCD (Mortality from CVDs, any of CVDs, cancer, and diabetes, or cancer, diabetes or CRD)	It is the percentage of 30-year-old-people dying before their 70 th birthday due to chronic respiratory diseases, assuming that they would not die from any other cause (e.g., injuries or HIV/AIDS).		Percent (%)

Variables	Definition	Sign	Measurement
CHE (Expenditure on Healthcare)	It indicates health costs and care services in the form of tangible assets as well as the importance of healthcare services for economic growth and development. It is expressed as a proportion of GDP. Funds given to students or educational departments are provided by both governmental and non-governmental sectors in the form of financial support. This is aimed at maintaining the level of education for economic development of short-term and long-term plan.	-	% GDP
PSE (Education on Public Spending)	It is a type of pre-mature mortality that occurs globally, although the most frightening scenario is observed in poor and medium income economies. It is main cause of the risk factor diseases, such as heart and coronary diseases and kidney failure-related diseases.	-	% GDP
PHt (Presence of Hypertension)	It is the percentage of the population whose habitual food consumption is insufficient to provide the dietary energy levels required to maintain a normal active and healthy life.	+	% of adults
PUn (Prevalence of Undernourishment)	The percentage of people who drink water that comes from a better source that is on-site, available when needed, and free of excrement and priority chemicals.	+	% of population
SDW (Securely Drinking Water)	The percentage of people who use improved sanitation facilities that are not shared with other households allowing the disposal being securely transported and processed from the site.	-	% of population
SMS (Improved Sanitation Practices)		-	% of population

Note. Source of Data: WDI (World Development Indicators)

In formulating the panel of 23 developing economies, such as Mexico, Turkiye, Algeria, Brazil, Ethiopia, Bahrain, Jordan, Kuwait, Malaysia, Mali, Central Africa, South Africa, Afghanistan, Bangladesh, Benin, Egypt, India, Indonesia, Namibia, Pakistan, Iran, Oman, and Saudi Arabia, this study used the following equation:

$$LnMCCD_{it} = \beta_0 + \beta_1 LnCHE_{it} + \beta_2 LnPSE_{it} + \beta_3 LnPHt_{it} + \beta_4 LnPUn_{it} + \beta_5 LnSDW_{it} + \beta_6 LnSMS_{it} + \varepsilon_{it}$$

Where Ln = Natural log, i = cross section or countries, t = time period or dimension, MCCD = Mortality from CVDs, cancer, diabetes or CRD, CHE = Expenditure on Healthcare, PSE = Education on Public Spending, PHT = Presence of Hypertension, PUn = Prevalence of Undernourishment, SDW = Securely Drinking Water, SMS = Improved Sanitation Practices and ε = White noise.

In this methodology, static panel model was employed, such as a fixed or random effect to determine the nutritional components that have an impact on mortality from CVDs, cancer, and diabetes in developing economies (Boz, [2021](#); Kim et al., [2023](#)).

Results

The empirical findings of the data from 23 developing countries would be explained in this section.

Descriptive Statistics

Descriptive statistics typically include measures, such as mean, standard deviation (indicates the deviation of the data from the mean), minimum, maximum (range of the data), and skewness (asymmetry of the data distribution). Positive skewness values, such as MCCD, CHE, PSE, PUn, SDW, PHT, and SMS are negatively skewed. Furthermore, the kurtosis values reflect the peaked data distribution, with PSE and PUn having leptokurtic distributions. This is because its value is more than three, whilst the other variables, such as CHE, PHT, SDW, and SMS are platykurtic.

Table 2

Results of the Descriptive Analysis (N = 345)

Variable	Mean	Deviation	Minim	Maxim	Skewness	Kurtosis
MCCD	22.364	6.965	11.3	40.1	0.718	2.718
CHE	5.202	2.448	1.268	14.127	0.945	3.203
PSE	4.259	1.716	1.108	10.639	0.988	4.158
PHT	37.589	5.450	24.7	47	-0.191	2.18
PUn	10.310	9.918	1.5	55.2	1.996	7.405
SDW	38.076	39.623	0.01	100	0.397	1.44
SMS.	50.364	24.815	3.819	100	-0.092	2.219

Correlation Analysis

Correlation analysis is employed to find out the association or relationship among the outcome and controlled variables.

Table 3

Correlation Analysis (MCCD)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) MCCD	1.000						
(2) CHE	0.118 (0.028)	1.000					
(3) PSE	-0.291 (0.000)	0.391 (0.000)	1.000				
(4) PHt	0.327 (0.000)	0.344 (0.000)	0.277 (0.000)	1.000			
(5) PUn	0.613 (0.000)	0.165 (0.002)	-0.213 (0.000)	0.023 (0.665)	1.000		
(6) SDW	-0.525 (0.000)	-0.026 (0.629)	0.008 (0.881)	0.196 (0.000)	-0.363 (0.000)	1.000	
(7) SMS	-0.340 (0.000)	-0.092 (0.089)	0.032 (0.557)	0.339 (0.000)	-0.515 (0.000)	0.439 (0.000)	1.000

Note. *p*-values in parenthesis

Figure 1

Matrix Plot of All the Variables MCCD

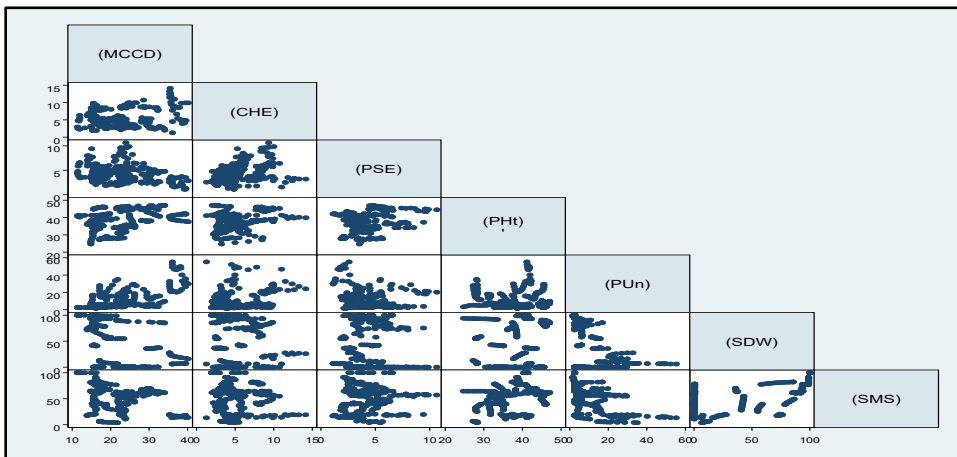


Table 3 reveals that there is a negative link between CHE, PSE, SDW, and SMS along with MCCD, and this relationship is statistically significant at 1% rate. Furthermore, the consequences of the PHt, PUn with MCCD have positive associations which are statically significant at a rate of 1%.

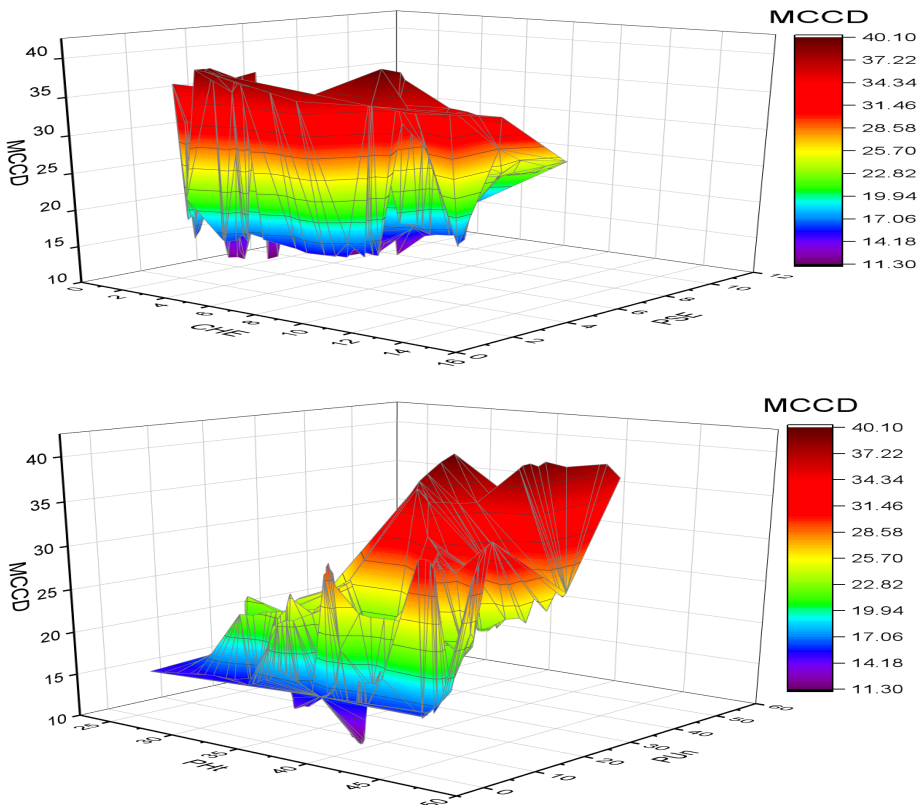
The matrix plot in Figure 1 illustrates the associations between all variables used in model (MCCD) analysis. The lower diagonal of the plot shows that the variables CHE, PSE, SDW, and SMS were MCCD negative, while PHt and PUn were positive and linear.

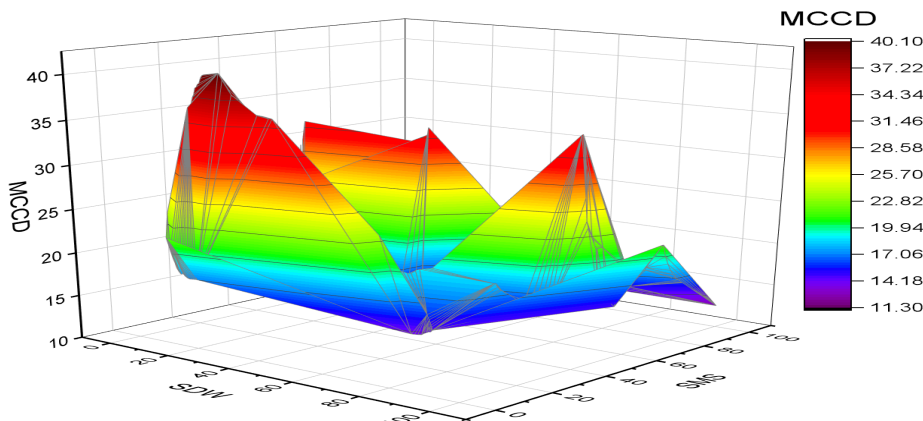
Three-dimensional (3D) Plot for all Variables

This section explains the three-dimensional (3D) plot visualization for all input and outcome variables used in model estimation as shown in the following figures.

Figure 2

Three-Dimensional (3D) Plot for Model (MCCD)





The x-axis and y-axis show the all-independent variables, such as CHE, PSE, PHT, PUn, SDW, SMS. Whereas, z-axis indicates dependent variables mortality from CVDs, cancer, and diabetes (MCCD). The peak direction on the surface of red-colored shaded area shows high point relationship between variables. Similarly, the surface valleys, such as purple and blue colors, depict lower point among variables. Contour lines provide information about the function's behavior and gradients, whilst grid lines help in the accurate interpretation and measurement of data points on the plot. So, the direction and relationship of different variables have been presented used in the model.

Table 4

Panel Unit Root Test

Variables	CIPS	
	I (0)	I (1)
MCCD	-2.07***	-2.92**
CHE	-1.38	-3.33*
PSE	-1.55	-3.20*
PHt	-2.60*	-3.87*
PUn	-1.20	-2.13***
SDW	-2.06	-2.68*
SMS	-1.78	-2.30**

Note. Critical values at 10% (-2.07), 5% (-2.17), & 1% (-2.34) lags (1)

Panel Unit Root Test

The statics panel unit root test is used to check whether the stationarity

of the variable exists or not.

According to the findings of CIPS test, the PSE, SDW, CHE, SMS, and PUn were stationary at the first difference, although PHt and MCCD were stationary at the at level I (0).

Static Panel Model MCCD

Table 5 presents the regression results for static panel model MCCD (Mortality from CVDs, cancer, and diabetes). The study employed Hausman test to select fixed effects (FE) model and random effects model. The results of the test indicated that the chi2 value was 30.09 with p -value 0.000 less than 1%, and showed that the study used FE model. The findings revealed that better health effects had a beneficial and substantial impact on MCCD. The panel regression findings demonstrated that CHE (current health expenditure) had a negative influence on MCCD, indicating a positive and significant increase in human health. The panel regression findings of FE model revealed that a 1% rise in current health expenditure (CHE) resulted in a 0.371 fall in IMR, which is significant at the rate of 1% in FE model.

PSE also had an inverse influence on MCCD, indicating a positive and significant increase in human health in FE model. Results indicated that a 1% increase in PSE would bring about a 0.527% decrease in MCCD which is significant at the rate of 1%. The PHt had a positive impact on MCCD. The FE results revealed that a 1% increase in PHt causes a 0.219% increase in MCCD, at the rate of 1%, it is significant. PUn had a positive influence on MCCD; a 1% rise in PUn resulted in a 0.017% fall in PUn, that is insignificant at the rate of 1%.

People who use SDW have an inverse interaction with MCCD. A 1% rise in SDW results in a 0.125% drop in MCCD, at the rate of 1% it is significant. The SMS showed an indirect influence on MCCD. It demonstrated that increasing the securely sanitation services by 1% causes a 0.139% fall in MCCD, which is significant at the rate of 1%.

The use of p -value of F-statistics showed that at the rate of 1%, the overall result was significant. The model's R-squared value indicated that 50% of the changes in the dependent variable were related to the included independent factors, and other changes were by outside factors of the model. This study also found that all variables had cross-sectional dependence, heteroskedasticity, and autocorrelation in a panel model. So, this study

employed the PCSEs (Panel Corrected Standard Errors) model as a robustness estimation approach.

The findings of the PCSEs model demonstrated that a 1% rise in CHE results in a 0.236% drop in MCCD, and it is significant at the rate of 5%. The regression findings demonstrated that a 1% rise in spending on the education of public causes a 0.593% drop in MCCD, at the rate of 1% it is significant.

Table 5

Regression Results for Static Panel Models (MCCD)

Exp. Variables	Coefficient (Standard Errors)			
	Model 1	Model 2	Model 3	Model 4
MCCD (Mortality from CVD, Cancer Diabetes)	Pool-OLS	FE	RE	PCSE
Healthcare Expenditure (CHE)	-0.004 (0.088)	-0.376*** (0.090)	-0.371*** (0.090)	-0.236** (0.095)
Public Spending on Education (PSE)	-1.587*** (0.127)	-0.527*** (0.112)	-0.566*** (0.114)	-0.593*** (0.117)
Prevalence of Hypertension (PHt)	0.750*** (0.041)	0.219*** (0.076)	0.385*** (0.068)	0.582*** (0.046)
PUn (Prevalence of Undernourishment)	0.174*** (0.024)	0.017 (0.026)	0.037 (0.026)	0.185*** (0.030)
Safely Drinking Water (SDW)	-0.081*** (0.005)	-0.125*** (0.024)	-0.093*** (0.015)	-0.072*** (0.004)
Safely Managed Sanitation (SMS)	-0.055*** (0.010)	-0.139*** (0.020)	-0.104*** (0.018)	-0.008*** (0.009)
Constant	5.039*** (1.306)	29.886*** (3.428)	20.620*** (2.936)	4.828** (1.268)
R^2	0.77	0.50	0.54	0.92
F -test (Prob > F)	183.9(0.000)	28.34(0.000)	---	---
χ^2 (Prob > χ^2)	---	---	194.7(0.000)	795.6(0.00)
Countries			23	
Model MCCD	Hausman	CD test Pesaran's	Breusch-PaganLM	Autocorrelation
	Statistics (Prob)	Statistics (Prob)	chibar ² (1) (Prob)	F Statistics (Prob > F)
	30.09 (0.00)	6.99 (0.00)	1.30 (0.25)	117.65 (0.00)
Westerlund test for cointegration (Prob)			3.73 (0.00)	

Note. *** $p < 0.01$, ** $p < 0.05$. CD = Cross-Sectional Dependence Test

So, the results of the PCSEs regression showed that a 1% increase in PHt results in a 0.582 increase in MCCD, at the rate of 1% it is significant. The results revealed that for every 1% rise in PUn, the MCCD should increase by 0.185%, at the rate of 1% it is significant. However, in the FE model, it is insignificant. This is because it only focuses on within-unit variation, while PCSE efficiently handles cross-sectional dependence, heteroskedasticity, and autocorrelation. Furthermore, the PCSEs model predicts that a 1% raise in SDW would result in a 0.072% reduction in MCCD, at the rate of 1% it is significant. The results revealed that if SMS is raised by 1% of the entire population, MCCD should reduce by 0.008%, and it is significant at the rate of 1%. The use of *p*-value of F-statistics showed that at the rate of 1%, the overall result was significant. The model's R-squared value indicated that that 92% of fluctuations in the dependent variable were attributable to the included independent factors and 8% other changes are by outside factors of the model.

Discussion

The main aim of this study was to analyze the nutritional impacts of CVDs, cancer, and diabetes on mortality in 23 developing economies for the time period 2009-2023. Panel data analysis was used to uncover different nutritional factors that impact mortality from CVDs, cancer, and diabetes in 23 developing economies. For data estimation, the study employed unit root test, cointegration test, cross-sectional test, static panel model, and PCSEs model. The panel unit root test and cointegration test ensured that all variables were stationary and long-run relationships existed among all variables in the panel model. The overall statics panel result of the CHE and PSE had negative and significant impact on MCCD. This conclusion was also supported by previous research (Figueroa et al., [2023](#); He et al., [2024](#); Kundu & Chakraborty, [2023](#); Pham et al., [2023](#)). The panel regression result of the PHt and PUn had positive and significant impact on MCCD. Adeyeye et al. ([2023](#)), Andersson et al. ([2023](#)), Jiang et al. ([2023](#)), and Jin et al. ([2024](#)) reported the same results. Therefore, it is an important indicator to improve nutrition and global nutritional goals criteria. Furthermore, the panel regression result of the SDW and SMS showed negative and significant impact on MCCD. The outcome is in line with Wolf et al. ([2023](#))

Conclusion and Policy Recommendations

The study provided a nutritional-related impact on mortality caused by

CVDs, cancer, and diabetes in developing economies. This main finding concluded that the impact of CHE and PSE was significant and negative on the ratio of mortality from CVDs, cancer, and diabetes in developing countries. It is an important indicator to measure the nutritional status and save the population from non-communicable diseases. Higher spending on education decreases the risk of malnutrition and increases the nutritional status of families. So, the outcomes of public health sustainability improved in developing economies.

This study also concluded that the presence of hypertension and undernourishment showed a direct interaction. It showed that when it increases, the mortality from CVDs, cancer, and diabetes increases as well. Therefore, to improve public health, nutritional values should be promoted as well as the rate of hypertension should be reduced. This leads towards improving the nutritional level of health sustainability. This study concluded that people using the services of clean drinking water and sanitation had negative coefficients on the ratio of mortality from CVDs, cancer, and diabetes. It showed a positive impact on the nutritional health sustainability since it is the good way to reduce the risk of diseases.

The findings of this panel study concluded that these social and economic factors do not only affect the human health and well-being but also influence the nutritional status of families in developing countries. In developed countries, the nutritional status of families is overall good as compared to developing countries where lower food score indicates insufficient food supply with lower social and economic states. So, the improvement of different social and economic factors is an important factor to improve the human health sustainability and development goals in lower income economies. In these underprivileged economies, everyone has limited resources to fulfill the basic needs of life and to improve the status of human resource development.

Future Recommendations

The study also suggested recommendations for policy options and innovative solutions, improving the overall nutritional status and protect communities from chronic diseases. In developing countries, where lower social and economic status is the main cause of underdevelopment, more spending on nutrition can improve the overall quality of life. The positive health approach has positive impacts socially and physically on human body

and mind. Hence, the use of sustainable policies and competent workforce, that bring awareness among populations, has positive impacts. This promotes healthy behavior and protects communities from chronic diseases and epidemics in developing economies. This study also had some limitations, such as data problems, possible errors, and limited generalizability across countries and contexts.

Author Contribution

Maria Iftikhar, writing-original draft. validation, supervision, Identification of objectives, Empirical Results. **Hina Ali**, conceptualization, formal analysis, methodology, software, resources, investigation, **Nazish Iftikhar**, conceptualization, writing - review & editing

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

Data supporting the findings of this study will be made available by the corresponding author upon request.

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Generative AI Disclosure Statement

The authors did not use any type of generative artificial intelligence software for this research.

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