

## Evaluation of Patients' Knowledge Regarding Chronic Non-Communicable Diseases

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### KEYWORDS

non-communicable disease, risk factors, knowledge, participants, health personnel

### ABSTRACT

**Introduction:** WHO reported that Non-Communicable Diseases (NCDs) are the major cause of early deaths worldwide and remain one of the major health challenges globally public health threats. Understanding the risk for NCD is important to adopting a healthy lifestyle which can have a positive influence in the reduction of NCD. Primary Health Care physicians and nurses in the family play an important role in identifying, diagnosing, and preventing NCD in the family and community.

**Objectives:** this study aims to evaluate the individual's perception, knowledge regarding NCD, and intentions to change their lifestyle in primary health care.

**Methods:** Our study is cross-sectional and has been conducted in the primary health care center Tirana, Albania from January - May 2023. The total number of participants was 360 (over 25 years old). Data were collected using a self-administered questionnaire on demographic characteristics, information about the perception, and knowledge of NCD, the role of health care, and intentions to change lifestyle. We performed the statistical analysis through the IBM® SPSS® Statistics software.

**Results:** The results showed that (n= 302)83.9% of participants are from Tirana, (n= 194) 53.9% of them are male and the majority of them (n=106)29.4% are 35-44 years old. Regarding the education level, (n= 200)55.6% have studied secondary school and (= 100)27.8% high school, nearly (n=285)79.2% are employed. An association between employment status with the perception of NCD was shown, older ages, employed people, higher education level and women have better levels of knowledge about NCD  $p < 0.05$ .

**Conclusions:** This study informs about that the patient's knowledge about NCD was low but physician and family nursing have important roles in informing individuals and families of risk factors in NCD. People informed can lead to individual sensibilization for NCD, reduce the incidence, and grow patient satisfaction.

### 1. Introduction

Approximately 41 million annual deaths that are caused by Non-communicable diseases (NCDs) have been reported by the World Health Organization in 2022, accounting for 74% of all deaths worldwide. The age affected

by NCDs more often (such as cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases) is between 30-70 years old.[1] CDC reported in 2021, that noncommunicable diseases (NCDs) are responsible for 7 out of 10 deaths worldwide,

with 85% of premature NCD deaths occurring in low- and middle-income countries. [2] Recently NCDs have often been reported in urban zones including (air pollution), population aging, and lifestyle behaviours (unhealthy diet, use of alcohol and tobacco, and the lack of physical activity). WHO 2019 reported that the most important metabolic factors that increase the risk of NCDs are obesity, hypertension, hyperlipidemia, and hyperglycemia.[3] Some studies have defined NCDs can leading to a greater demand on the healthcare system already overwhelmed because they can cause long duration and slow progress [4,5]

NCDs are responsible not only for millions of deaths each year but for most people have an impact on reduced quality of life. Most of the literature has reported that the most common NCD morbidity and mortality could be prevented or delayed, and millions of people could live longer healthier, and happier lives. They have described the situation as the “Invisible Epidemic of NCD” [6] or “tsunami wave effect” [36] but is important to emphasize that NCDs are diseases related to an individual's behavior [9]. Risk factors for NCD are classified as modifiable or nonmodifiable factors. The modifiable risks can be monitored so the healthcare workers can do more involving high blood pressure, smoking, diabetes mellitus, physical inactivity, obesity, and high blood cholesterol. The nonmodifiable risk that cannot be reduced or prevented by intervention factors involves age, gender, genetic factors, race, and ethnicity. [7,8] The predominant global public health challenge of the 21st century will be NCDs [6], which are projected to increase from 38 million in 2012 to 52 million by 2030 [9] Adopting a healthy lifestyle in people in all stages of life can positively influence the reduction of NCD.

Most of the risk factors of NCD are modifiable and strongly related to individual behaviours that can influence people's awareness of the risk that they have. People must be educated about health care specifically for lifestyle in a manner that prevents noncommunicable diseases.[11] People who understand the risk of disease can change their lifestyle and follow the proper intervention for their health and they can collaborate with healthcare to reduce anxiety, become satisfied with the healthcare system, and reduction of health costs.[10,11] The World Economic Forum in 2011 estimated that the loss of productivity due to NCDs is significant: for every 10% increase in NCD mortality, the economic growth decreases by 0.5%.[12]Healthcare spending, national income, and macroeconomic productivity are all greatly affected in WHO regions by NCDs according to recent studies. [13]

### **The situation in Albanian country**

Public health and INSTAT in Albania reported that in recent years our country has had an increased number of people with NCDs, which include cardiovascular disease, cancer, Diabetes Mellitus, pulmonary chronic disease, and problems of mental health(depression). [14,15,16] Our country has been affected mostly by risk factors that contribute to the increase of NCDs, specifically socio-economic status, cultural, political situation, and environmental changes (globalization, urbanization, and aging population), modifiable risk factors (tobacco and alcohol use, sedentary life, unhealthy diet), intermediate factor(hypertension, hyperglycemia, hyper cholesterol, obesity). [14,15] All of these factors can contribute to premature death increase morbidity and overload of the healthcare system. This situation is a challenge for public health and health care professionals to design a

sensibilization plan for the population for the importance of knowing and preventing specifically the modifiable risk of NCD. [14,15] The National Health Report in 2014 reported that cardiovascular diseases are the top cause of mortality in Albania accounting for 59% of all deaths. During the last two decades, it has seen an increased mortality rate from non-communicable diseases (Cardiac disease, Neoplasm, Diabetes, and pulmonary disease). [17] Albania is a country located in Eastern Europe with a communist history before 1990 and is undergoing a major change in the current epidemiological situation. This situation has resulted in a major case of non-communicable diseases (NCDs) as a result of demographic change, urbanization, lifestyle changes, and economic growth.[18,19] For healthcare personnel is very important to identify the risk factors of NCD and to be more careful with the individuals because can help explore their perception of developing NCD. NCDs are often determined by an individual's actions have been reported in some literature. Fortunately, many of the factors that involve a risk individual can be changed. When people think about how likely they are to develop a specific disease, it may influence their effort to protect against it proactively this can improve their understanding of the importance that have NCDs. [7,10,11] It has been evaluated that an individual need to recognize the possibility of developing a disease and how influences their health to successfully adopt a healthy lifestyle, regardless of the actual risk from the NCDs. [20] Patients who understand the risks associated with the disease are motivated to incorporate healthy behaviors into their daily routine actively and to follow mandated preventative measures. [20]

## 2. Objectives

In this framework, we aimed to evaluate the individual's perception, and knowledge regarding noncommunicable diseases and intentions to change their lifestyle in primary health care.

## 3. Methods

This cross-sectional study was conducted at Primary Health Care No 4 Tirana, Albania included patients over 25 years old. We used the "Patients' knowledge regarding chronic NCDs" questionnaire to evaluate their perceptions and knowledge regarding NCDs. Sampling was realized in a primary health care centre in Albania from 20 January to 20 May 2023. The survey included a representative sample of (n=360) participants who agreed to complete the questionnaire with structured and semi-structured questions, focused on assessing the knowledge level of NCD. Then we continued with the next step to develop the questionnaire for the target population.

### Data collection

The survey was conducted using and selected some of the items of questionnaires from the article [10] adapted in the Albanian language for the study aim. When preparing the questionnaire, the use of technical terms was kept to a minimum to retain clarity, particularly for the benefit of participants who took part in the study. The interviews, were conducted through direct contact with participants face-to-face to collect the information. The paper-based responses were gathered in a Microsoft Excel spreadsheet. The questionnaire needs approximately 30 minutes to complete. A full version of the questionnaire administered to all study participants is presented in Annex 1. The questionnaire can easily be divided into seven main blocks. The independent variables included personal and demographic

characteristics: age (categorized into 25-34 years, 35-44 years, 45-54 years, 55-64 years, > 65 years), gender, education (categorized into 8-9 years (primary), secondary and high school), employment status (categorized into employed vs. unemployed), city resident; information about the perception related to NCD (five items) (dichotomized into yes, no, I don't know), level severity for NCD (include five items) (dichotomized into yes, no, I don't know), perceived benefit related to NCD (seven items) (dichotomized into yes, no, I don't know), knowledge about NCD (eight items), (dichotomized into yes, no, I don't know), the role of health care personnel (three items) (dichotomized into no, little, less), and intentions to change lifestyle (ten items) (dichotomized into yes, no, I don't know).

### Statistical analysis

Data was gathered through self-reporting paper-based questionnaires completed in the presence of the author and a collaborator.

The participants were recruited via convenience sampling characteristics that represent inclusion criteria: adults over 25 years old, of both genders (male, female), non-diagnosed with NCD, who come to primary health care for different reasons (check-ups, counsel for themselves or to accompany family members) in health care centers. The different levels of knowledge of NCD according to the results of the questionnaire were defined/classified based on the responses in frequency and percentage according to the questionnaire and the possible values are yes, no, I don't know. From the consecutive visits, 360 participants agreed to complete the questionnaire with their consent. Detailed information was given to all participants in the

study, and their right to accept or refuse to participate in the study. Questionnaires were provided anonymously, to maximize accuracy and reliability concerning the responses obtained. Based on the prerequisites presented above, all the steps of the research protocol have been followed by the Health Research Ethics Board Medicine University, Tirana, Albania. When preparing the questionnaire, the use of technical terms was kept to a minimum to retain clarity, particularly for the benefit of participants who took part in the study.

Descriptive statistics for each question were presented as frequencies and percentages. When considered important a graphical presentation follows the results. ANOVA was used as a statistical technique to ponder over demographic characteristics of patients' variables such as age, gender, city, education level, and occupation status. We performed the statistical analysis through the IBM® SPSS® Statistics software.

### 4. Results

There were, 360 participants who fulfilled the inclusion criteria over 25 years old in the survey. Frequency distribution of participants' demographic characteristics we have seen the mean age of participants in our study was Mean  $\pm$  SD (45.3  $\pm$  5.55 years).

Table 1 presents the (block 1 questionnaire) distribution of sociodemographic characteristics among study participants. Nearly (n = 194) 53.9% of participants were male vs. (n= 166) 46.1% women. Of the highest percentage of participants (n=106)29.4% were 35-44 years old. From Tirana city were (n=194)83.8%. Many of them have studied secondary education level (n= 200)55.5% and employed (n=285)79.2%.

Table 1. Distribution of socio-demographic characteristics of participants

Gender	Frequency	Percent
Female	166	46.1
Male	194	53.9
Total	360	100.0
Age	Frequency	Percent
25-34 years	66	18.3
35-44 years	106	29.4
45-54 years	90	25.0
55-64 years	66	18.3
> 65 years	32	8.9
Total	360	100.0
Education level	Frequency	Percent
8-9 years	60	16.7
secondary	200	55.6
high	100	27.8
Total	360	100.0

Employment	Frequency	Percent
Employed	285	79.2
Unemployed	75	20.8
Total	360	100.0
County	Frequency	Percent
Vlorë	2	0.6
Berat	5	1.4
Dibër	7	1.9
Durrës	15	4.2
Fier	6	1.7
Gjirokastër	8	2.2
Korçë	4	1.1
Kukës	7	1.9
Lezhë	2	0.6
Shkodër	2	0.6
Tirana	302	83.9
Total	360	100.0

Table 2 presents (block 2 questionnaires) a clear picture of the perception related to NCD. Binary logistic regression assessed the association of five final questions compared to important topics such as demographic characteristics. Based on the multivariate analysis showed a significant association between unhealthy behaviors and employed status ( $p = 0.004$ ). It showed a significant association with employment and healthy lifestyle habits ( $p < 0.002$ ). There was a significant association with variables of education level and past behavior lifestyle, healthy lifestyle,

and perception related to NCD ( $p < 0.001$ ). It showed a significant association with the increase of age of the participants that have a better perception related to NCD ( $p < 0.001$ ). The study found that was statistically associated with variables of perception related to NCD might have NCD, past behaviors, healthy lifestyle ( $p < 0.001$ ) with employment status ( $p < 0.005$ ).

Table 2. Perception related to NCD

	Yes	No	I don't know	Total	Age	Gender	Tirana	Education level	Employment
	N/%	N/%	N/%	N/%	P	P	P	P	P
1. Do you think might have NCD	255(70.8 )	50(13.9)	55(15.3)	360(100.0)	0.277	0.800	0.593	0.200	0.000
2. Do you think you might have NCD in the next 10 years	131(36.4)	58(16.1)	171(47.5)	360(100.0)	0.000	0.691	0.769	0.000	0.222
3. Do you think you may have NCD because of past behaviors.	115(31.9)	103(28.6)	142(39.4)	360(100.0)	0.000	0.292	0.477	0.000	0.004
4. Do you think that healthy lifestyle habits are attainable	158(43.9)	162(45.0)	40(11.1)	360(100.0)	0.000	0.563	0.903	0.000	0.002
5. Do you think you are too young to suffer from NCD	141(39.2)	128(35.6)	91(25.3)	360(100.0)	0.000	0.093	0.976	0.000	0.904

Block 3 of questionnaires present the level of perceived severity for NCDs. We did not find an association between variables. 37.8% the participants responded with yes to question one “Having NCD has a great effect on lifestyle and family”. 80.3% for question four “Thought of NCD scared them” expressed Yes about 80.3% and are respectively the age group 25-34 years old and 35-44 years old. Only 4.4% of people 55-64 years old responded Yes to question that NCDs like heart attacks and cerebral hemorrhages are always fatal for health, with the increase of age showed a better level of perceived severity for NCD.

Table 3 (block 4 of questionnaires) presents the perceived benefits of a healthy lifestyle related to NCD. Based on the multivariate analysis showed a significant association between female gender and physical activity, a healthy diet, stopping smoking ( $p < 0.009$ ), and stopping alcohol and ( $p = 0.019$ ) will reduce the change for NCD. Based on the multivariate analysis showed a significant association between Tirana city and the importance of a healthy lifestyle and ( $p < 0.005$ ), regular health checks that detect NCD early and ( $p < 0.001$ ).

Table 3. Perceived benefits of healthy lifestyle related to NCD

	Yes	No	I don't know	Total	Age	Gender	Tirana	Education level	Employment
	N/%	N/%	N/%	N/%	p	p	p	p	p
1. Do you think that increased activity will decrease your chances of having an NCD.	103(28.6)	115(31.9)	142(39.4)	360(100.0)	0.124	0.041	0.067	0.880	0.204
2. Do you think that eating a healthy diet will reduce your chance of having an NCD.	129(35.8)	56(15.6)	175(48.6)	360(100.0)	0.151	0.036	0.149	0.166	0.647
3. Do you think that stopping smoking will reduce your chances of getting NCD	148(41.1)	128(35.6)	84(23.3)	360(100.0)	0.466	0.009	0.042	0.969	0.600
4. Do you think that physical activity has a positive effect on your health?	159(44.2)	41(11.4)	160(44.4)	360(100.0)	0.480	0.291	0.114	0.678	0.351
5. Do you think that healthy food positively affects your health?	115(31.9)	120(33.3)	125(34.7)	360(100.0)	0.503	0.021	0.005	0.273	0.452
6. Do you think cutting down on alcohol will reduce your chances of NCD.	83(23.1)	203(56.4)	74(20.6)	360(100.0)	0.019	0.026	0.260	0.232	0.820
7. Do you think that regular health checks will detect NCD early?	153(42.5)	36(10.0)	171(47.5)	360(100.0)	0.841	0.060	0.000	0.276	0.500

Table 4 present (block 5 of questionnaires) shows the knowledge about NCD for the participants. The results presented in this table found a statistically significant relationship between female gender and information that periodic health checks affect NCDs, ( $p <$

$0.012$ ), between age with information about the causes of NCD ( $p < 0.07$ ), between higher education and information about lifestyle, quitting alcohol( $p < 0.010$ ) and smoking affects NCDs ( $p < 0.09$ ).

Table 4 Knowledge about NCDs

	Yes	No	I don't know	Total	Age	Gender	Tirana	Education level	Employment
	N/%	N/%	N/%	N/%	p	p	p	p	p
1. Do you have information that periodic health checks affect NCDs?	111(30.8)	150(41.7)	99(27.5)	360(100.0)	0.639	0.012	0.867	0.261	0.049
2. Do you have information about the causes of NCD?	88(24.4)	128(35.6)	144(40.0)	360(100.0)	0.007	0.669	0.059	0.258	0.072
3. Do you have information on NCD prevention?	87(24.2)	172(47.8)	101(28.1)	360(100.0)	0.044	0.631	0.233	0.089	0.057
4. Do you have information about impact of lifestyle on NCDs	147(40.8)	121(33.6)	92(25.6)	360(100.0)	0.053	0.253	0.059	0.048	0.496
5. Do you know that maintaining a healthy weight and physical activity affect NCDs?	151(41.9)	125(34.7)	84(23.3)	360(100.0)	0.906	0.192	0.305	0.429	0.701
6. Do you have information that smoking cessation affects NCDs	254(70.6)	84(23.3)	22(6.1)	360(100.0)	0.231	0.056	0.093	0.009	0.716
7. Do you have information that quitting alcohol affects NCDs	254(70.6)	82(22.8)	24(6.7)	360(100.0)	0.222	0.211	0.088	0.010	0.986
8. Do you have information that controlling T/A and/or cholesterol levels and taking prescription medications affect NCD?	113(31.4)	60(16.7)	187(51.9)	360(100.0)	0.778	0.134	0.753	0.992	0.402

Block 6 of the questionnaires presents the role of healthcare personnel in primary care. We did not find an association between variables with age, gender, city, education level, and employment status. 52.2 % of participants responded no to the question after the contact with the health personnel you will change your lifestyle.

Block 7 of the questionnaires presents the intentions to change the lifestyle of the participants. Age group 35-44 years old that have responded “Yes” to the questionnaires’ intentions to change the lifestyle. The results presented in this block found a statistically significant between participants that were from Tirana who showed intention that would be physically active ( $p = 0.009$ ), employed status



shows that can take medication to control arterial pressure and/or fats ( $p = 0.015$ )

## 5. Discussion

According to global burden disease, NCDs have increased in recent years due to morbidity and mortality in healthcare settings across the countries [21] particularly risk factors have been of great importance in recent years. [34] In our country, have an impact the urbanization and aging of the population on the growth of non-infectious diseases, which poses a challenge for health personnel. It has been reported that the ratio of NCD to the total disease burden has increased in both genders, from 59% in 1990 to 79% in 2010 [14,23]. This situation is associated with an increase in comorbidities of patients. [14] WHO reported that in 2016 in Albania, 93% of deaths were caused by NCDs, and men are more affected by premature death between 30-70 years old. [16],[22]

This study describes perceptions and knowledge of NCD risk factors among patients attending primary health care, including participants over 25 years old, a healthy population unaffected by NCD. This questionnaire in our study enabled us to understand the influence of clinical knowledge and perception of NCD in people. The participants with the highest percentage of 53.9% were men, and secondary level of education predominated, while in a study in 2022 [31], higher education predominated. Gender differences in perceived benefits related to NCD are similar to other studies [11]. Men are more affected by behavioral/lifestyle risk factors that are in line with other studies [7] and present poor levels of knowledge about NCD. Participants with 8-9 years or secondary education level come rarely for visits to the primary care service which is in line with a study that reports low education in patients is

related to rare visits to primary health care and an increase in NCD.[29]

The results of this study show that the knowledge about NCD in the study group was poor and a similar situation is presented in other studies, [25] showing that in general, the knowledge about NCD was weak. The male gender has poor knowledge of NCD respectively from the age group 35-44 with secondary education level and unemployed status. Women present better knowledge in the perception of risk related to NCD supported by other studies [24] other studies [11] have reported that both men and women see themselves as more at risk from NCD. However, employed people were more likely to change their unhealthy lifestyles. According to a study, the most at risk from NCD in our country are unemployed individuals. [35] 39.4% of the participants in the study think that they are not at risk for NCD from their previous lifestyle, while the literature contradicts this fact and reports that adapting the lifestyle at a young age reduces the risk of NCD. [25],[9],[11] About the question after contact with health care do you change lifestyle we see that 28.9% would not change their lifestyle, which shows resistance to medical interventions or previous medical interventions have not been convincing and efficient or they have lost the trust of the medical staff where other studies can investigate more about this fact. The participants that come from Tirana have more information that regular health checks will detect NCD early about 92.2% of them, health politics need to be more for the people that live in other cities and villages because don't understand the importance of health checks.

Poor knowledge about NCDs can make individuals unable to prevent, cope with, and fight against the NCD epidemic reported in the

literature. [25] In Albania, mortality and the burden of diseases related to the five main risk factors for the period 1990-2017, nearly 80% of mortality comes from smoking, dietary risk, and high blood pressure have been reported from some studies. [14] From the discussions in the focus group, we found that participants with a high level of education have better knowledge about a healthy lifestyle which is in line with other studies [31], which leads to a decrease in NCD. A low level of education leads to an increase in the incidence of NCD in both men and women, some findings were reported by respondents from the literature [28] that a low educational level is directly related to a high risk of growth in patients with NCD. [29],[35] The nursing role is of great importance because the nurse was the most frequent contact with the health care centers by the participants of the study [26] this is similar to our study, it was found that the participants had the most frequent contact with the nurses, especially the family doctor nurse.

Nearly 68.9% of participants had contact with a nurse in primary care, which explains the nursing role in primary health care. 39.4 % of participants don't have information about all risk factors and the follow-up of preventive treatment. 39.2% of the participants think that they are too young to suffer from NCD, this is a frequent situation that health personnel encounters with patients in our country, and further research can bring recommendations regarding better informing patients that NCD is they also affects young people. [26], [23], [24], [33]

Some studies have reported that skilled and trained nurses [30] on NCD will bring a positive approach regarding adequate programs for informing patients about the risk factors of NCD, the importance of prevention, [30] identification, diagnosis, treatment, and

continuous monitoring, especially the nurse in the community. [27] Many studies report that the role of the nurse in the family in primary service is quite important, especially those who educate individuals in all age groups, especially in adolescence [34] about the risk factors and prevention of NCD [27]

A positive approach regarding the awareness of individuals for periodic control, and the identification of risk factors, especially NCD, has also been the check-up program, which is carried out for the ages of 35 to 70 years in our country.[33] In modifiable factors we can intervene, which refers to characteristics that both society and the individual can change, bringing about a change in health outcomes.[7] Changing lifestyle is a challenge for all individuals. [24] In our study, participants with a high level of education showed an interest in changing their lifestyle and past unhealthy behaviours (smoking, alcohol, physical inactivity, unhealthy food). Our study is similar to the study [28] that lifestyle and behaviours are higher in people with a low level of education. The participants in a working relationship understood the importance of changing unhealthy lifestyles to stop or reduce smoking or alcohol consumption, the importance of a healthy diet, and the inclusion of physical activity in their daily lives. A significant role in preventing NCD, changing lifestyles through awareness programs, and educating people on risk factors is family nursing. [27] Programs offered by health personnel related to health promotion should be updated frequently to bring effective intervention that improves the situation related to NCDs.[31] The inclusion of physical activity in their daily life was presented more by the participants who lived in Tirana and is attributed to the policies and promotion made by the public health in the country and the

health system as a whole that is in line with other studies in our country. [32]

In our country, the health system in primary service plays an important role both for the patient and the family, where the first contact is the doctor and the family nurse this applies to other countries where they have the same health system model [31] and emphasize the importance of health personnel in the prevention of NCD risk factors for patients and their families. In recent years, WHO and public health in our country have put a lot of emphasis on modifiable factors for NCDs, which include obesity, unhealthy behavioural factors such as physical inactivity, poor diet in the right nutrients, high fat intake in general, and saturated fat in particular, consumption of sugary drinks (artificially sweetened drinks), alcohol and tobacco use, and social factors including cultural, socio-economic, and environmental. Prevention and control of NCDs can be achieved at all ages for all modifiable factors. [6,7,8],[10],[14],[35]

## 6. Conclusion

The study addressed an important global health issue, focusing on the knowledge gap regarding chronic NCDs among patients in primary care settings in Albania. This contributed to understanding public perceptions and knowledge about NCDs, which is crucial for preventive health care measures. It is very important to strengthen healthcare personnel, in identifying risk factors of NCD, implementing programs, updating protocols, and continuing education in nursing families and communities. Policymakers need to be more for all health system levels for better monitoring quality of care with a focus on patient and family education in a healthy lifestyle, to control better NCD situation this brings a reduction of NCD, a better quality of life, and cost-effectiveness for health care system.

## Strengths and limitations of this study

A questionnaire guided by a literature review, patient focus group, and data analysis, was developed among (n=360) individual representatives of the target population. Questioner validity was assessed via a patient focus group not representative of the target population.

Limitations for the study we have focused on one health care centre only in Tirana city and is a small champion.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

**Author Contributions:** Conceptualization and methodology, A.P.; software and formal analysis, I.A.; investigation, A.P.; data curation, A.P and I.A.; writing—original draft preparation, A.P.; writing—review and editing, A.P. and R.GJ.; supervision, A.P. All authors have read and agreed to the published version of the manuscript.

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## **ANNEX 1. QUESTIONNAIRE ADMINISTERED TO STUDY PARTICIPANTS**

- *A-Sociodemographic data:* gender, age, residence, educational level, employment status
- *B-Perception related to NCDs :* think you may have NCD; do you think you may have NCD in the next 10 years; think you may have NCD because of past behaviors; think that healthy lifestyle habits are unattainable; think you are too young to suffer from (yes, no, don't know)
- *C-Level of perceived severity for NCDs:* do you think that having NCD has major effects on your life and family; Do you think having an NCD affects your work and income; do you think having an NCD affects your physical disability; the thought of having NCD scares you; think NCDs like heart attacks and cerebral haemorrhages are always fatal (yes, no, don't know)
- *D-Perceived benefits related to NCDs:* think that increasing activity will decrease your chances of having an NCD; eating a healthy diet will reduce your chance of getting an NCD; stop smoking will reduce the chances of getting NCD; think that physical activity has a positive effect on your health; think that healthy food positively affects your health; think cutting down on alcohol will reduce your chances of NCDs; think that regular health checks will detect NCD early. (yes, no, don't know)
- *D-Knowledge about NCDs:* do you have information that periodic health checks affect NCDs; do you have information about the causes of NCD; do you have information on NCD prevention; have information about lifestyle and impact on NCDs; do you know that maintaining a healthy weight and physical activity affect NCDs; you have information that smoking cessation affects NCDs; have information that quitting alcohol affects NCDs; do you have information that controlling T/A and/or cholesterol levels and taking prescribed medications affects NCD; (yes, no, don't know)
- *E- The role of health care personnel in primary health care:* your most frequent primary service contact;(doctor vs. nurse); have you been informed about all the risk factors and the follow-up of preventive treatment (no, little, yes);think that after the contact with the health personnel you will change your lifestyle (yes, no, don't know)
- *F-Intentions to change lifestyle:* I will reduce and stop smoking (if I smoke);I will maintain a healthy weight; In two months I will be physically active; I will maintain a healthy weight; I will be physically active; I will eat a healthy and balanced diet; I will reduce and stop alcohol; I will keep a healthy and balanced diet; I will take medication to control arterial pressure and/or fats; Always follow doctors/nurses orders to improve health (yes, no, don't know)