



**Universitatea
BABEȘ-BOLYAI**

Research report on the extent, drivers, and symptoms of energy poverty in Cluj-Napoca

This report is written as part of the project "Mitigating GHG Emissions through energy poverty alleviation in Romania" (EnPowerR) project

Implemented by Babeș-Bolyai University, in partnership with adelphi GMBH (Berlin) and Cluj-Napoca municipality

Supported by:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety



European
Climate Initiative
EUKI

based on a decision of the German Bundestag



Contents

1. Introduction.....	1
2. Survey methodology.....	1-2
3. Case selection.....	2-3
4. General data.....	3-4
5. Energy poverty indicators applied to Cluj-Napoca.....	4-8
6. Some compelling findings.....	8-11
7. Recommendations based on the scientific and policy report.....	11-13
a) Households.....	11
b) Public Administration.....	11-13
c) Utility companies	13
8. ANNEX.....	14-89



Introduction

The scientific research component in the EnPower project aims to provide the necessary support for data-based policy recommendations aimed at the Cluj-Napoca municipality, the Cluj-Napoca Metropolitan Area, and also, at a broader level, to municipalities in Romania and to the Romanian policy-makers at the central level. From a data perspective, the project had two goals - to acquire existing data and to generate new data - addressed through Activities I.3, I.3a and I.3b in the project proposal.

In terms of existing data, we sought to acquire household level data on a number of variables related to energy poverty and GHG emissions. This data is collected and stored by public and private stakeholders, therefore a significant part of our effort since the beginning of the project in November 2019 has been to work with these stakeholders to provide the data they possess. This has been only partly successful, yet sufficient to allow the proper implementation of the project and the elaboration of the policy recommendations we sought out to develop. It is obvious, nevertheless, that the effort of gathering and integrating data in a way that allows for long-term development of data-based policies will be ongoing and will surpass the duration of this project.

In this report we present the data acquired through the household survey. We will first explain the methodology, including the reasons why Cluj-Napoca is a compelling case to study. We will then provide some general relevant data on Cluj-Napoca and move on to applying some of the main indicators used to quantify energy poverty, while also acknowledging their limitations. We will summarize the most important findings. The appendix provides the detailed answer to each question.

Survey methodology

The household survey in Cluj-Napoca covered a representative sample of 826 (out of a population of 148074) households, randomly selected, with an error rate of 5%. The data collection took place



between October 20th and December 20th, 2020. The purpose of the data collection was mainly to capture behaviors, values, and attitudes of Cluj-Napoca citizens with respect to energy consumption and services in their own households, in the context generated by the socio-demographic characteristics of each households, income, education, and overall subjective perception of the quality of life within the household and within the community. At a more specific level, the purpose of the survey was to capture the extent of energy poverty in Cluj-Napoca by investigating variables associated with dimensions of the phenomenon.

The items included in the questionnaire are grouped into three main categories: 1) items related to attitudes, behaviors, and perceptions over the environment and the quality of life within the household and at the level of the city, 2) items related to energy services inside the household, consumptions, equipments, and other technical features of the dwellings, 3) social, demographic, and financial characteristics of the household.

Case selection

Despite the widespread image of Cluj-Napoca as a city in a continuous development, with a booming academic, economic and cultural life, as a “magnet city” as labeled by the World Bank, with various labels, such as “innovative” or “smart”, attached to it, this survey illustrates several elements associated to social and economic inequalities, profoundly rooted in the patterns of the city’s development. This is not specific only to Cluj-Napoca, but to many rapidly developing urban communities across the post-communist space, but also in Western contexts.

Bearing in mind the typical variables associated with energy poverty - mainly low income, low energy efficiency of the residential building stock - a quick glance at the city points to the fact that Cluj-Napoca displays the proper context for energy poverty to occur. The city’s biggest residential neighborhoods - Manastur, Gheorgheni, Marasti, Grigorescu, Zorilor - are built during communism, between the 1960s and 1980s, therefore most collective residential buildings bear certain common features which point to low efficiency: at least 30 years old, poor initial insulation, made of concrete or prefabricated panels. Thus, such buildings clearly need interventions for thermal rehabilitation, which have happened for part of them and to a larger extent than in other



urban areas. Moreover, the initial outer ring of the city - Iris, Dambu Rotund, Someseni - comprises mainly individual houses similar to rural households. The last 20 years has witnessed a booming construction sector, with new residential buildings occurring in the older neighborhoods, but also newer neighbourhoods being built within the limits of the city - Buna Ziua, Sopor. Moreover, some of the villages just outside the city's limits - Floresti, Apahida, Baci - have also seen a significant amount of new residential development, transforming into virtually neighborhoods of the city, although they remain de facto separate localities and part of the Cluj-Napoca Metropolitan Area. This complex dynamic has favored a peculiarly expensive housing market, the most expensive in Romania, with prices located at 1800 euro per sq meter in an older collective building and 1900-2000 euro per sq meter in a new collective residential building (with some estimations going as high as 2400 euro per sq meter). In terms of material poverty, Cluj-Napoca is known among developing cities with extreme poverty enclaves at the outskirts, with the communities around Cantonului street and next to the Pata Rat landfill gathering more than 1500 people, mainly ethnic Roma. From a different perspective and also bearing the features of communist legacy, Cluj-Napoca is a city with a formerly exhaustive district heating system, but marked by a long flow of disconnections following 1990, similar to other cities in Romania, yet with less problems than in Bucharest and with significant more will from the local government to invest and to maintain it at a viable and competitive level.

Thus, we decided to focus on Cluj-Napoca as a compelling case for the study of energy poverty as it offers some of the key dimensions foster energy poverty in post-communist communities, but also holding certain features which are specific to developing Western cities.

General data

The number of inhabitants in Cluj-Napoca, according to official statistics in 2020, was 327.985 people. To this, an estimated 80.000 students live in the city, raising the estimated active population to over 400.000. The city is located at an altitude of 360 meters above sea level. The climate is temperate continental, with mild winters (an average of -3C in January) and mild summers (an average of 19C in July), but with spikes of heat which are constantly increasing the number of tropical summer days, especially with respect to perceived temperatures in crowded



residential areas. There are 148074 registered households, with a total of 7,9 million square meters, requiring 1,37 million MWh per year for heating and warm water, out of which 88,3% come from natural gas and the rest from thermal energy supplied by the district heating company. 205 blocks of flats have so far been renovated through various programs relying on public or European funding.

Energy poverty indicators applied to Cluj-Napoca

When trying to assess the extent of energy poverty, there are some key indicators well-rooted in the literature: 2M, M/2, LIHC, 10%.

First, however, some necessary limitations regarding the usefulness of these indicators. The complexity of energy poverty and the many dimensions and dynamics that determine its occurrence at the level of a household or community explains why in practice, in public policy, it is difficult to reach an operational definition that covers all households in energy poverty. In the absence of a definition, it is difficult to find an all-encompassing indicator to give the "exact" dimension of the phenomenon at the national level. As mentioned above, forcing this effort leads to a waste of energy that can be allocated to identifying solutions when different causes or effects of energy poverty are identified among the population.

Another element that dilutes the usefulness of applying the indicators, no matter how eloquent each of them is, is the quality of the data, which is a significant problem in Romania - and Cluj-Napoca is no exception, despite the authorities portraying the city as “smart” or “digital”. Any indicator we apply depends on the accuracy and availability of the necessary data, all being the prerogative of either local or central institutions (mayors, prefectures, county councils, inspectorates, agencies, central or statistics institute at the county level), or private companies involved in distribution and supply of energy, which hold the essential data related to the consumption of thermal energy, electricity or gas, but also those related to infrastructure and network. Our attempts throughout this project to have access to the multitude of data necessary to compose the most accurate picture of energy poverty in Cluj-Napoca have encountered many procedural, administrative barriers and also obstacles related to a lack of understanding of their



relevance. In other situations, existing data is of poor quality or inaccessible formats. A more complete perspective based on data can be acquired only by sharing at least data on income, the state of the housing stock, and consumption at the household level.

Two other elements complicate attempts to quantify the extent of energy poverty - the contribution of citizens and trust. Behavior of citizens within their own households, standards and perceptions of comfort, as well as attitudes and values that determine behaviors, but also household endowments, quality of equipment, priorities related to their own budget - all these elements are essential to understand energy poverty and accurate data about them cannot be acquired without the understanding, involvement and cooperation of citizens. When we talk about energy poverty in the residential environment, we are talking about energy poverty in households that are, in 98.7% of cases nationwide (with similar levels in Cluj-Napoca), privately owned. Citizens' trust in entities that could request such relevant data - state institutions at local or central level, private energy companies, researchers, NGOs - is at very low levels. For example, trust in mayors varies from one locality to another and is usually higher than in the Government or Parliament (constantly below 20%, even significantly below sometimes), but rarely exceeds 30%. Cluj-Napoca is an exception in this respect, our data placing trust in the municipality at 60%, which places the municipality in an enhanced key position to enable meaningful change. We also assume that the level of trust or availability of cooperation between institutions is not very high, without any concrete data in this regard.

That being said, the use of indicators developed in the literature remains useful to realize the major magnitude of this phenomenon, in the hope that decision makers and actors involved in the energy chain (from production to supply in households) will be aware of its gravity. Recent years have provided an abundance of research evidence on the impact of energy poverty on the health (including mental health) of members of an affected household, on the ability to develop a normal social life and community involvement, and, more generally, on the quality of life. Moreover, the negative effects significantly exceed the household level, with toxic social and political effects, by undermining confidence in institutions and corporate actors involved in access to energy, thus contributing to creating the context that capitalizes and builds populist and anti-democratic discourses.

Each of these indicators has shortcomings and offers only a part of the picture. Six indicators are most often used in practice to point to a situation of energy poverty: 2M, M/2, LIHC, 10%, arrears on utility bills, damp inside the household. The first two refer only to absolute expenditures and only point to other potential variables that influence the size of energy expenditure in a household. 2M (overspending) and M/2 (underspending or “hidden energy poverty”) were constructed as indicators that each point to an extreme of the phenomenon. A household can only be in one of the two situations at a given time, but the two can be summed up to give a more complete picture of the magnitude of the phenomenon, as it refers to the median energy expenditure as a reference point. LIHC and 10% bring in the relation between income and the share of expenditure relative to income. All these indicators operate with annual monthly averages; While revenues do not vary by season, none of these indicators capture the size of the phenomenon in the seasons when energy expenditures increase - especially in the cold season due to the need for heating, but also during the summer due to the need for cooling. Although the high energy expenditures indicated by 2M and 10% may suggest an energy efficiency issue, none of these indicators include it as a main variable. The last two are considered to be proxies of energy poverty. Arrears on utility bills show difficulties in keeping up with the bills, while damp (on walls, floors, foundation, plus leaking roof or rot on windows frames or floors) shows inadequate warming and/or poor energy efficiency.

So, the answer to the question "How many households are energy poor in Cluj-Napoca?" is "It depends." We will now move on to quantifying the extent of energy poverty in the city by applying the indicators commonly used in practice, but also pointing to the limitations of each of them.



Indicator	National value	Cluj-Napoca value	What does it mean?
2M	10%	5,4%	The household spends more than double the national median of expenditures on energy.
M/2	11,7%	4,1%	The household spends less than half of the national median on energy ("hidden energy poverty")
LIHC	13%	9,6%	The household falls below the poverty line after paying for energy AND spends more than the national median for energy
10%	45,3%	41,7%	The household spends more than 10% of its income on energy
Damp in household	9,4%	20,36%	Has the household had damp in the previous year?
Outstanding bills in previous year	15,4%	11,81%	Has the household had outstanding energy bills throughout the previous year?

Some compelling findings

The survey has revealed some useful elements on the spread of energy poverty in Cluj-Napoca and has contradicted some of our initial expectations. Firstly, we expected to identify pockets of energy poverty at the level of the city. With the noticeable exception of the Pata Rat area, there do not seem to be such areas. Rather, energy poverty is dissipated across the city in older and newer neighborhoods, especially where collective buildings predominate. Secondly, we expected more energy poverty in buildings which have not been refurbished in any way. Again, that does not seem to be the case; energy poverty is present in both refurbished and unrefurbished buildings. However, this mainly a function of income and behavior and does not contradict the utility of investment in energy efficiency. Thirdly, income and behavior patterns do not seem to be connected in practice: lower income is not consistently associated with lower consumption. Finally, despite Cluj-Napoca branding itself as a city of more educated and more aware people with respect to global issues, the population of the city does not seem to display a higher willingness to prioritize such issues over personal comfort inside the household.

Before returning to energy poverty, let us have a look at levels of poverty, since the indicator for poverty is universally accepted and offers a good entry point into other structural issues at the level of the city. 19% of the households in Cluj-Napoca are below the poverty line, set at 1043 lei for a household with one adult and multiplied by the number of equivalent adults for each household. This places the city below the national poverty rate (around 23,5% in 2019), but above the EU average (16,8%).

In order to bring the energy dimension in the discussion, we built an indicator for energy vulnerability (a variation of the Low Income High Cost indicator) by which a household is considered to be in a state of vulnerability relative to energy if the household's residual income falls below the poverty line after paying energy bills. The energy expenditures refer to all possible fuels used in a household - electricity, natural gas, thermal energy, solid fuels (mainly wood) - and the calculation of the total energy expenditures refers to "value of your previous bill" for each fuel.



Given the data collection period, the previous bill refers to consumptions likely occurred in the months of September and October and billed one month later.

This indicator basically points to a condition of vulnerability due to energy expenses (“energy vulnerability”), where vulnerability means an incapacity to cover all important expenses in a household without falling below the poverty line after paying a particular one. According to this indicator, beside the 19% in poverty (implicitly energy vulnerable), an additional 5,7% fall below the poverty line after they pay their energy bills. Additionally, we created more categories based on the ratio between residual income after energy bills and the poverty line (the 24,7% mentioned above fall below value 1 for this ratio). An additional 16% of the population is slightly above 1 (up to 1,25), which exposes them to a significant risk of falling below 1 in case there is an increase in energy bills (mainly during the winter months). This indicator displays much higher values than the usual indicators and is also more accurate in describing the extent of vulnerability associated with energy expenses.

	Percent
Vulnerable (ratio below 1)	24,7%
Close to vulnerable (1-1,25)	16,3%
1,25-1,5	12%
1,5-2	21%
Above 2	26%
Total	100%

Regardless of the indicator we use, the poor/energy poor/vulnerable are not clustered in particular areas of the city. They are generally evenly distributed in both insulated and non-insulated buildings, both in collective residential buildings and individual dwellings, or regardless of the



type of fuel used for heating. There is only a slight tendency for 2M to be more present in apartments using thermal heating.

The survey also offers relevant data on the attitudes, perceptions, choices and overall behavior with respect to comfort and energy inside households. With respect to temperatures inside the household, they are set rather high, which seems to be in line with the preference expressed by 50,6% of respondents, who say they prioritize comfort - over environmental impact and size of the expenditures - when using energy. Over 56% set temperatures at no more than 21C degrees in their home, while the rest opt for 22-24C. Interestingly, half of the vulnerable category (amounting to 12% of respondents) prioritize comfort. Moreover, 80 to 90% believe climate change is a real threat to the planet, to their lives, and to future generations, yet only 10% prioritize the environment over comfort and price when it comes to making choices regarding energy in their household.

Income emerges as the main driver of energy vulnerability, with those below the poverty line clearly at risk of not being able to pay their bills. The “size” of the bills plays a smaller role in driving up vulnerability. While investments in energy efficiency naturally help in reducing consumptions and bills, they do not seem to make a difference between those who are vulnerable and not. Programs meant to increase energy efficiency surely need to be continued and supported, but properly addressing income shortages and raising awareness on the risks posed by overconsumption should be prioritized.

The annex displays the answers for all the questionnaire items.

Throughout the duration of the project, we accessed some other relevant datasets, which we have used to initiate an interactive map of the city, available here: https://energypoverty-ro.maps.arcgis.com/apps/webappviewer/index.html?id=65bd5f275f624f0e94ef85196011b3e9&fbclid=IwAR040_wETjX87ERnsMtkHPDTMOgtMm7QS90EIS1nQ8k6mq_Xu9M0fYUT-xA.

These datasets are:

- Heating benefits for thermal energy, natural gas, electricity, and wood granted in Cluj-Napoca in 2019.



- Rehabilitated collective buildings from 2009 to 2020, with information of energy performance certificates for each.
- Social households existing in Cluj-Napoca in 2020.
- Residential buildings connected to district heating, with consumptions and pricing.

Crucial datasets to which we did not yet receive access refer to consumptions of natural gas and electricity.

The data gathered through the survey, as well as the connection with the datasets mentioned above, are the foundation for the policy proposals formulated within the project.

Recommendations based on the scientific and policy report:

Three categories of recommendations can be formulated based on the scientific and policy report. They target the three main groups identified in the project proposal:

1. Households

- a. Information campaigns aiming at reducing indoor temperature at least at the level of the national standard of 21 degrees Celsius indicated in construction regulations. Arguments should be formulated around reduction of expenditure and an increase in available funds for other household priorities, as a half of those indicating an inside temperature higher than 21 degrees Celsius fall under or are very close to the poverty line. Alternative solutions for the improvement of indoor comfort should also be offered as a large part of the energy poor consumers prioritize indoor comfort.
- b. Raise awareness among households that cooperation with neighbours is important in order to access funding and pursue rehabilitation projects.

2. Public administration

- a. Coordinate information campaigns on consumption reduction at the level of households in line with local sustainability policies, especially given the fact that most efforts to improve energy



consumption and energy efficiency has been focused so far on public administration buildings and facilities, while the residential area is the most important consumer and polluter.

- b. Continue the efforts to rehabilitate residential buildings in Cluj-Napoca while better targeting the lowest-performing buildings and also including single-family buildings, which have so far not been included in any refurbishment programme
- c. A more systematic approach in collecting information on socio-demographic data, the technical characteristics of the buildings and facilities, energy consumption and bills, household income and expenditure, indoor temperature, values and consumption habits should be considered in order to better target interventions and better programme aid. Based on the data collected in the project, energy poverty appears to be scattered throughout the city and easy to mistarget, while blanket measures are resource-intensive and may lead to improving the situations of those households who are already better off.
- d. The implementation of a one-stop-shop at the level of the public administration to deal with energy poverty in a proactive way should be considered given the need for a proactive and integrative approach in terms of functions that are already being performed at the level of the local public administration in various offices and departments but which are rarely matched to target energy poverty. This integration is needed at the level of the following departments
- e. A consolidation of the department dealing with tenant associations, which is currently only pursuing a reactive role without having any systematic communication with these beneficiaries. It would be desirable for this department to establish an official communication procedure with tenant associations comprising all of these actors and their members. As tenant associations are only confined to multifamily buildings, contacts with single-family households should be also established. The local public administration is already using a number of tools to communicate with citizens on various issues, such as the newsletters, social media, or the mass media, however, for matters covering urban matters a more direct communication is desirable. This can be a useful tool to launch various information campaigns including on energy efficiency and consumption behaviour, climate impact or support schemes and programmes.
- f. Consolidating at the level of the public administration an informal working group of key stakeholders on the local energy market. This working group should include utilities, the public administration including the energy manager, consumer representatives, NGOs, academic and

research institutions, and work together to build trust, find solutions and initiate various programmes together. Trust-building at this level is important given the need for data, community awareness and involvement and solutions from all these actors. The objective of this group should be to generate commitment to implementing local priorities on sustainable energy consumption at the general level but also specifically in the residential sector . One of the tasks for this informal group should also be to commit to communicating data and finding solutions regarding energy poverty.

- g. Identification of other trust-building and cooperation mechanisms
- h. Finding solutions to halt the process through which households self-disconnect from the district heating to instal individual boilers - a trend that is contrary to climate objectives. The local authority has expressed intentions to prohibit the installation of individual boilers in new residential buildings, however alternative resources are not yet offered at the level of urban development plans. Moreover, solutions need to be found for the boilers already in use.

3. Utility companies

- a. Utility companies should regard energy poverty as a priority and a part of the european obligations on energy efficiency and liberal market play
- b. Utility companies should implement procedures and data analysis routines that would enable them to identify manifestations of energy poverty (excessively high or too low consumption related to household characteristics, adjournment of payments, lack of access, informal consumption) and initiate together with the local public administration and other relevant stakeholders (including within an informal group) a dialogue with the aim of finding suitable solutions.
- c. Better informed GDPR requirements and procedures are needed at the level of legal and management decision-making in private companies to guide them to analyze and share anonymized data on energy poverty especially when data is needed for scientific research and community welfare, which are considered to be special situations of GDPR, exempt of the usual requirements.



ANNEX

1. To what extent you agree or disagree with the following statements?

Please tell me to what extent you agree or disagree with the following statements?

	Total disagreement	Disagreement	Agreement	Total agreement
Global warming is a threat to future generations	0.48	11.03	31.03	56.97
Global warming is a threat to my life	1.33	19.27	46.18	33.09
Global warming is a threat to the planet	0.97	4.36	43.27	51.27
Guilty for global warming is especially commonplace	3.64	29.70	49.09	16.73
Guilty for global warming is especially the big companies	0.97	14.91	46.30	37.33
Politicians are mainly to blame for global warming	5.58	31.39	44.00	18.55
The area where I live is polluted	3.03	34.18	43.76	18.18
The city of Cluj-Napoca is polluted	0.85	20.48	56.85	21.58
The mayor's office should allocate more resources from the local budget so that everyone has access to energy as cheaply as possible	0.85	9.21	44.00	45.70
The mayor's office should allocate more resources from the local budget to reduce poverty	1.58	17.33	43.64	37.09
The way I behave in everyday life has an impact on the environment	2.06	16.24	47.39	33.94
The way I use my home energy sources has an impact on the environment	3.76	24.00	52.24	19.52

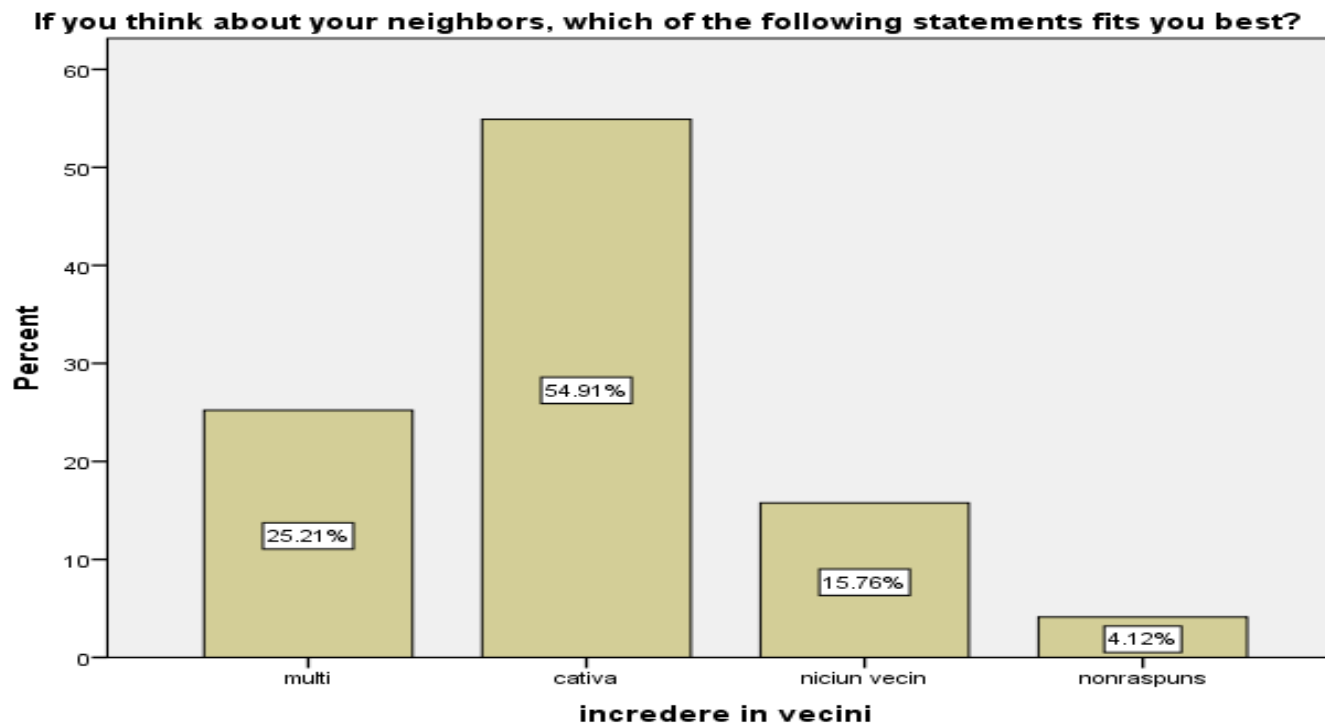


2. How much trust do you have in the following institutions or people?

How much trust do you have in the following institutions or people?

Pivot Field Names	I don't know, I don't answer	Not at all	Some	Much	A lot
Banks	1.09	29.42	45.76	21.19	2.30
City hall	0.48	4.72	27.72	59.81	7.02
Energy companies	2.30	7.38	53.39	34.38	2.30
Family, relatives	0.48	0.97	7.51	30.99	59.69
NGOs	4.24	12.59	40.68	37.29	4.84
Parliament	1.09	58.84	31.11	8.47	0.24
People you meet for the first time	1.57	25.06	53.27	18.89	0.85

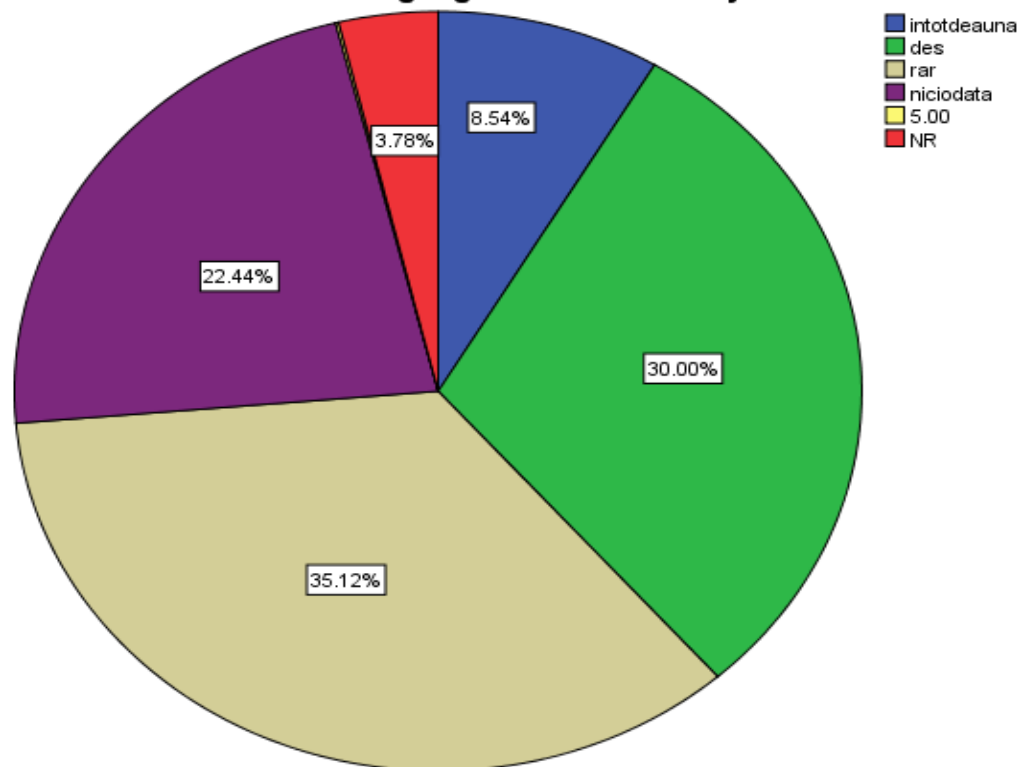
3. If you think about your neighbors, which of the following statements fits you best?





4. How often have you collaborated with your neighbors in actions related to your living together in the last 3 years?

How often have you collaborated with your neighbors in actions related to your living together in the last 3 years?



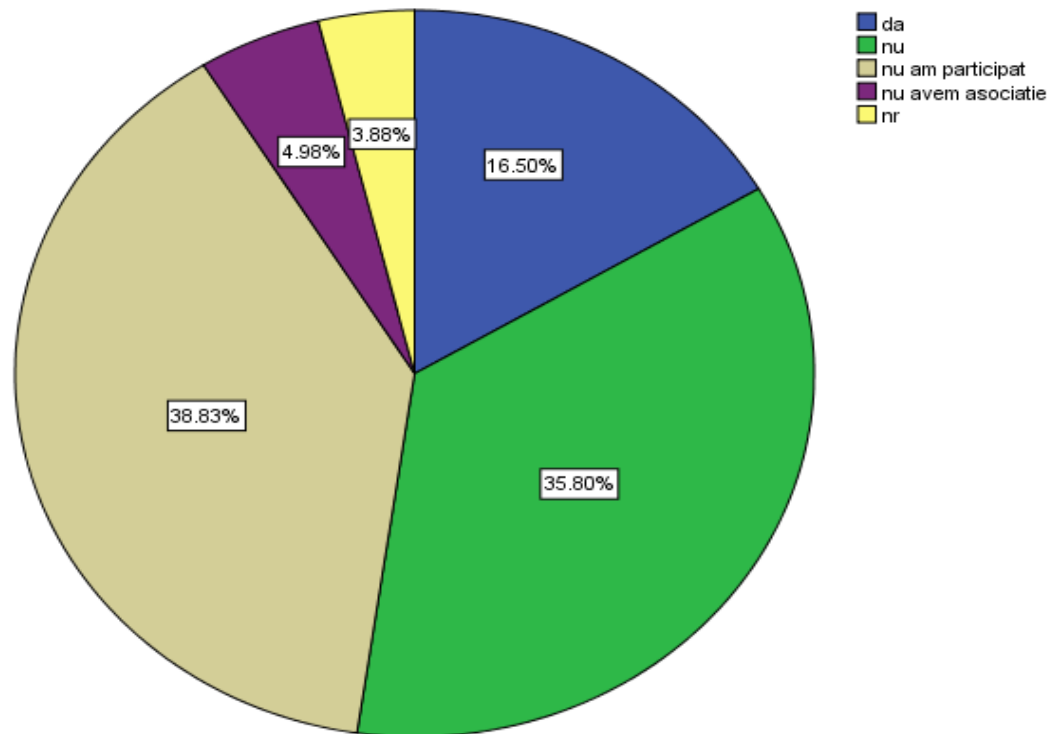
5. How important are the following elements in ensuring the thermal comfort of your home?

How important are the following elements in ensuring the thermal comfort of your home?

	I don't know / I don't answer	Not at all	Less important	Important	Very important
City Hall actions	1.82	2.18	19.49	46.73	29.30
Energy companies actions	1.69	1.94	19.13	43.34	33.54
Floor quality	1.45	0.24	9.69	46.00	42.13
Global warming	2.30	2.66	19.49	45.88	29.18
Household area	0.97	1.57	6.54	50.36	40.19
Household equipment	0.73	0.48	8.35	44.19	45.76
Household income	0.73	0.36	9.32	38.86	50.36
My own behavior	1.21	0.24	11.02	46.85	40.07
Neighbors' behavior	1.09	4.00	17.80	50.85	25.54
Number of people in the household	1.69	2.78	16.46	47.82	30.63
Outside weather	0.85	0.97	6.78	42.49	48.43
Owners' association actions	2.42	3.15	15.38	50.61	27.24
Roof/ ceiling quality	1.09	0.61	8.72	37.53	51.69
The quality of the wall frame	5.08	0.36	10.05	46.00	37.53
The quality of wall insulation	1.09	0.24	4.00	30.02	64.29
The thickness of the glass of the windows	1.33	0.00	3.27	45.04	49.88
The thickness of the walls	1.33	0.36	4.00	41.04	52.66

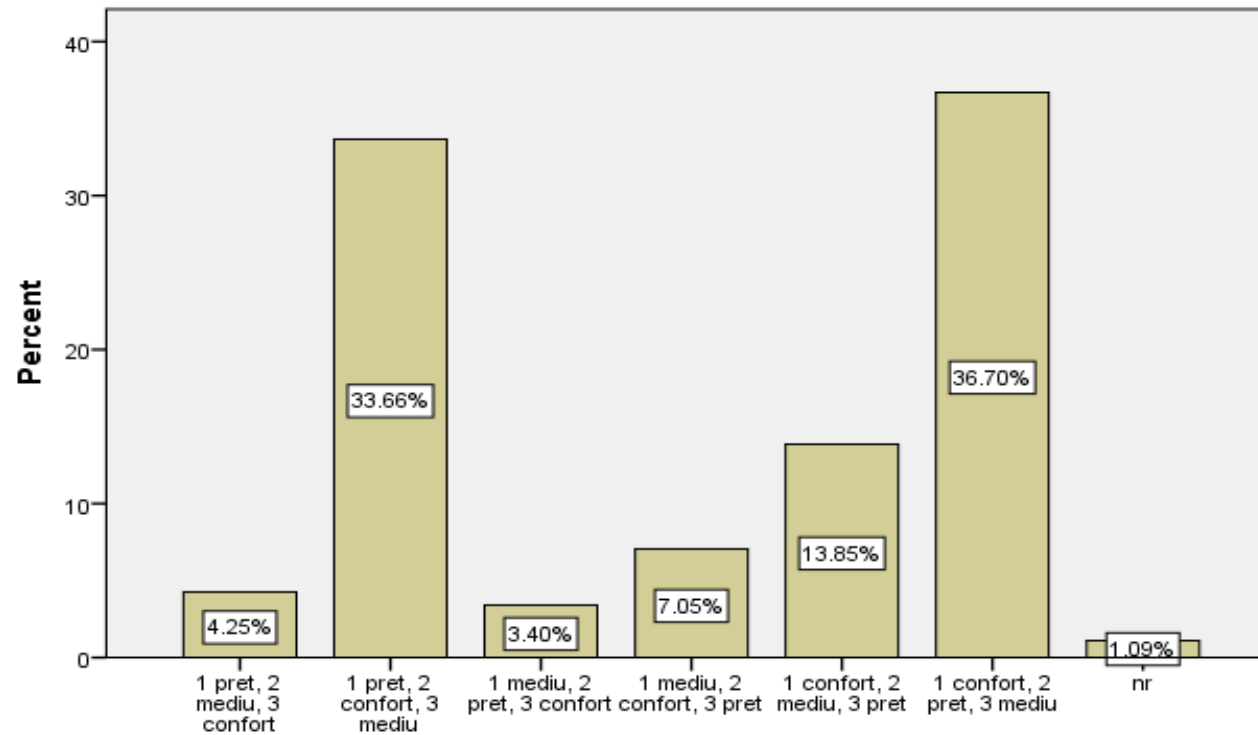
6. During the last meetings of the owners' association, did you discuss issues related to energy consumption or energy performance of the building?

During the last meetings of the owners' association, issues related to consumption were discussed energy or energy performance of the building?



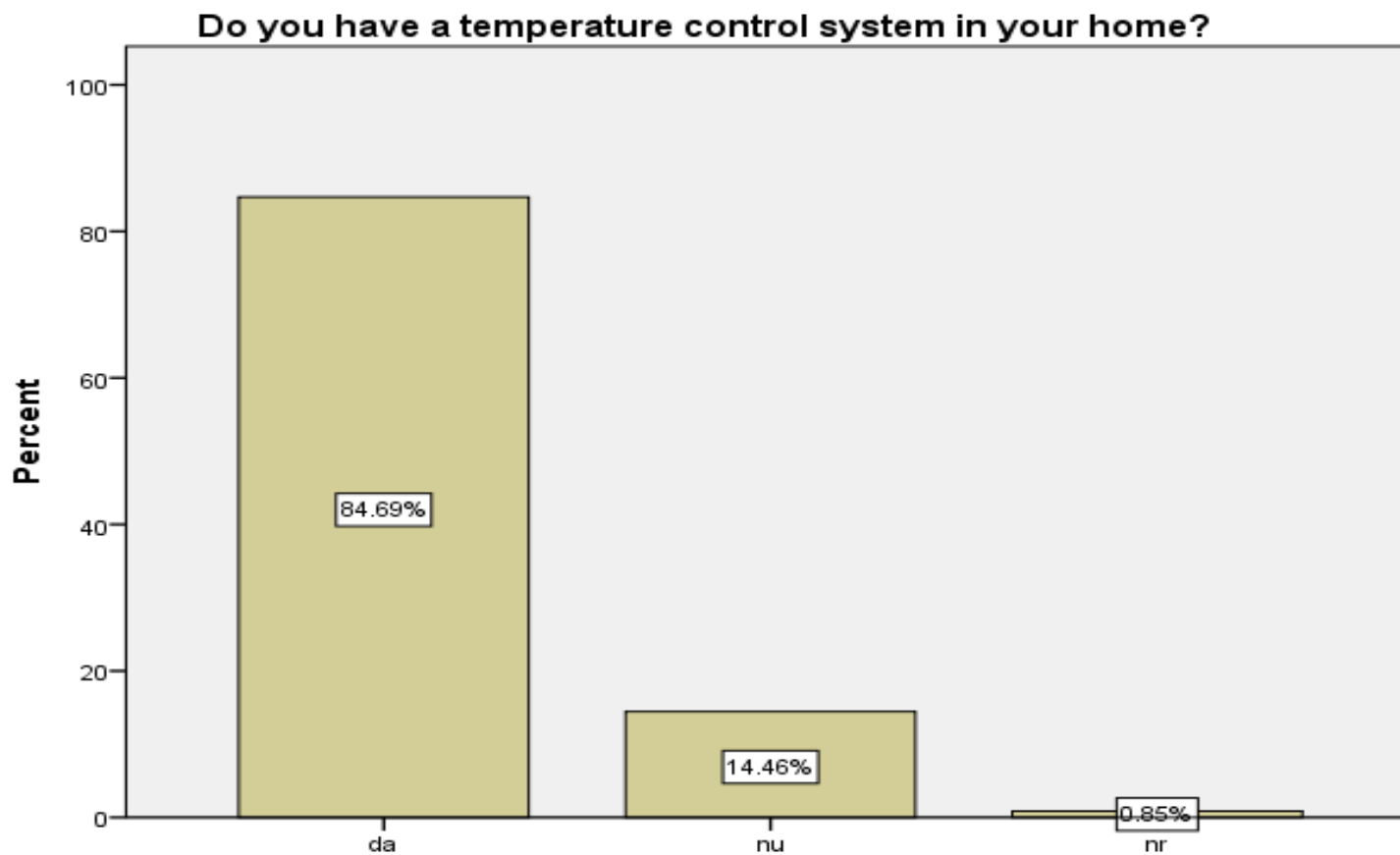
7. Please order from 1 to 3 the following aspects related to household heating, depending on how much it matters to you:

Please order from 1 to 3 the following aspects related to household heating, depending on how much does it matter to you:



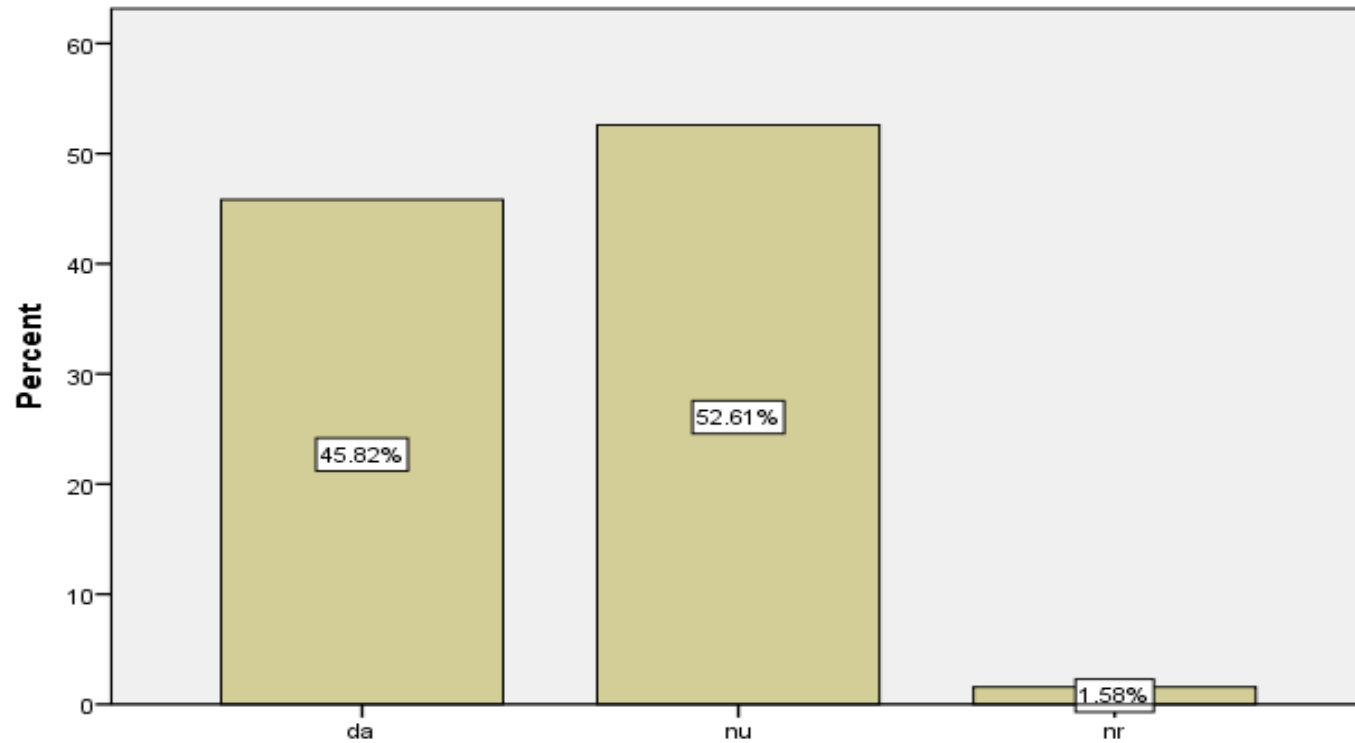


8. Do you have a temperature control system in your home?



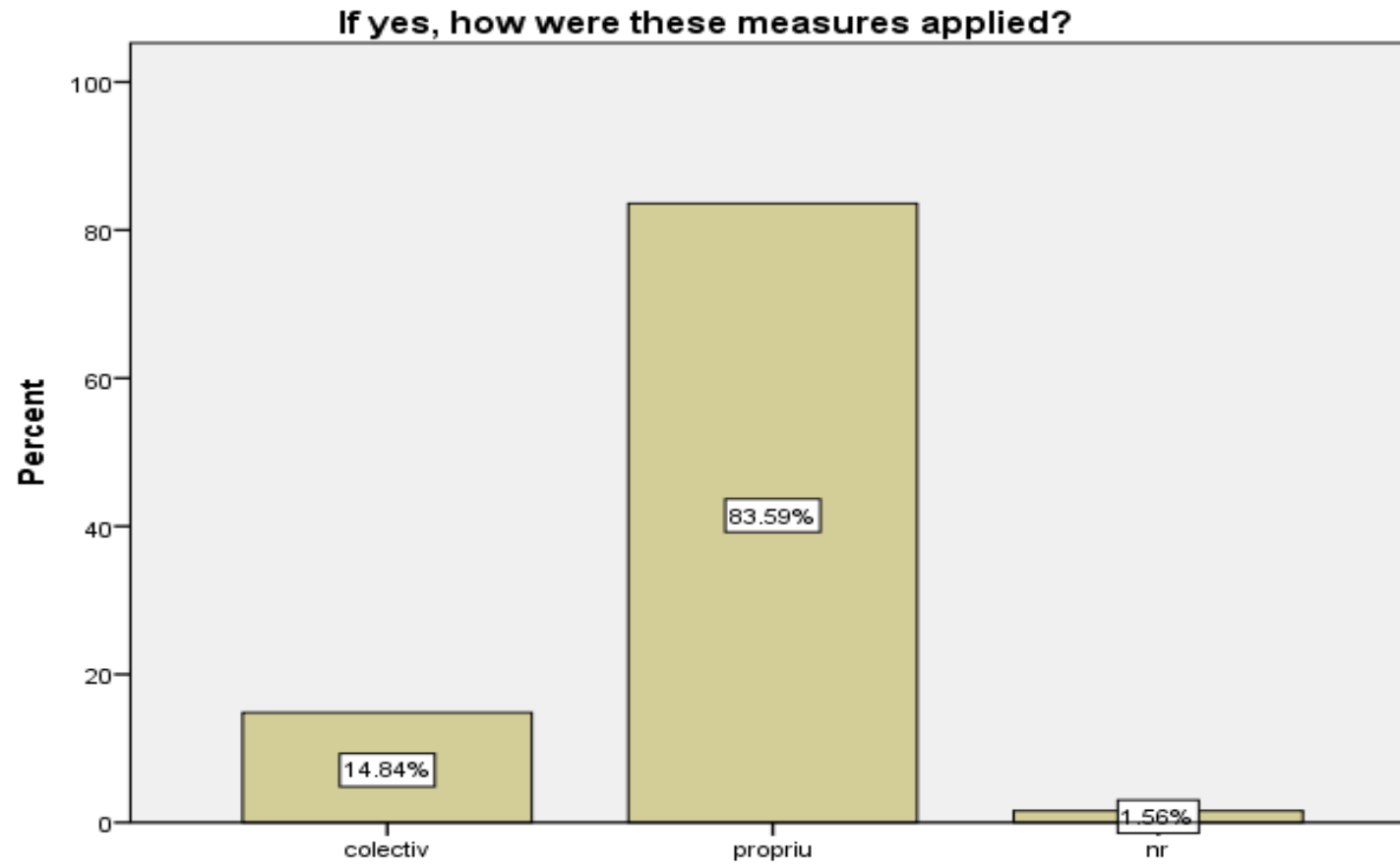
9. Did you apply measures to reduce energy consumption and to ensure thermal comfort in your house in the last 5 years?

You have applied measures to reduce energy consumption to ensure thermal comfort in the house in the last 5 years?

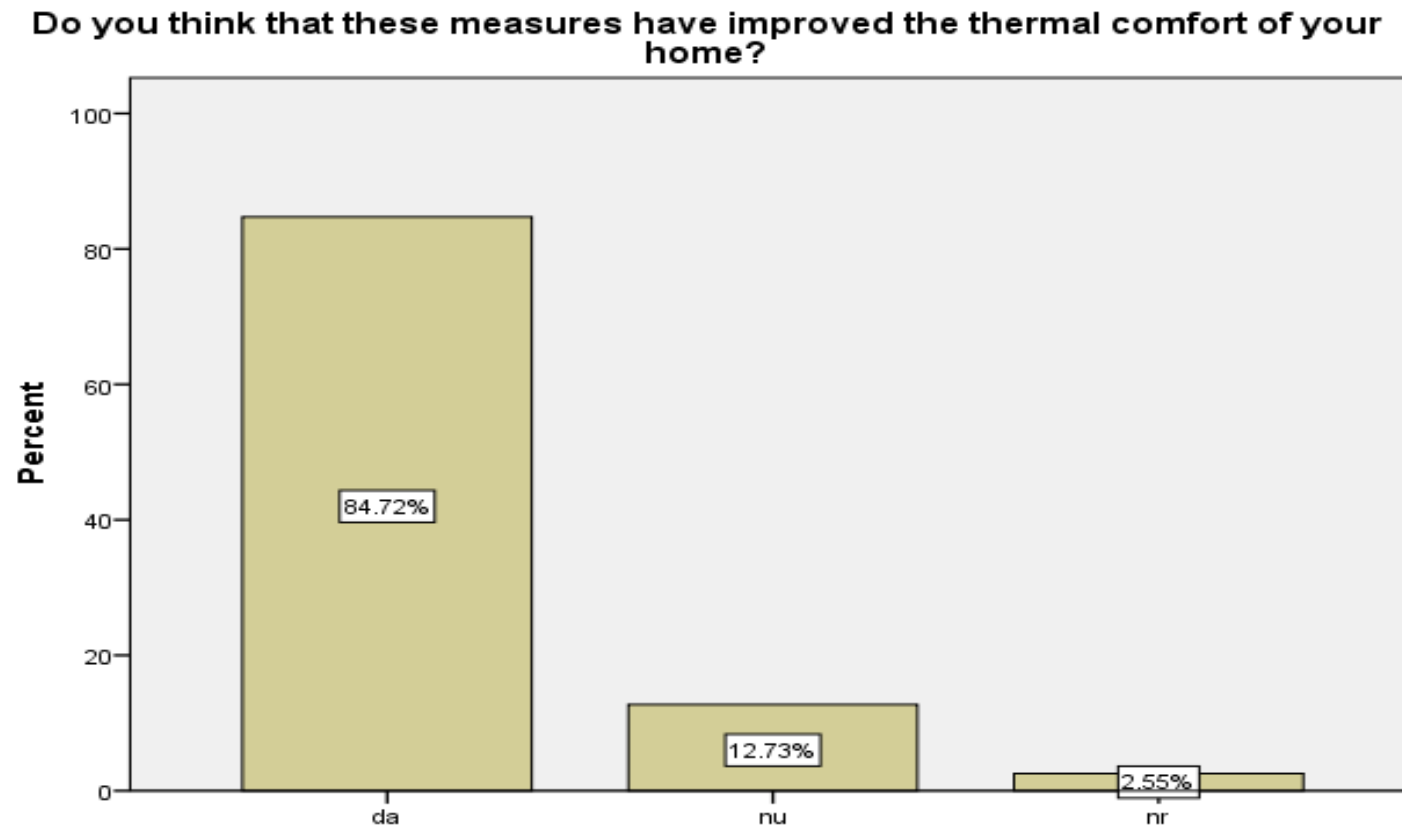




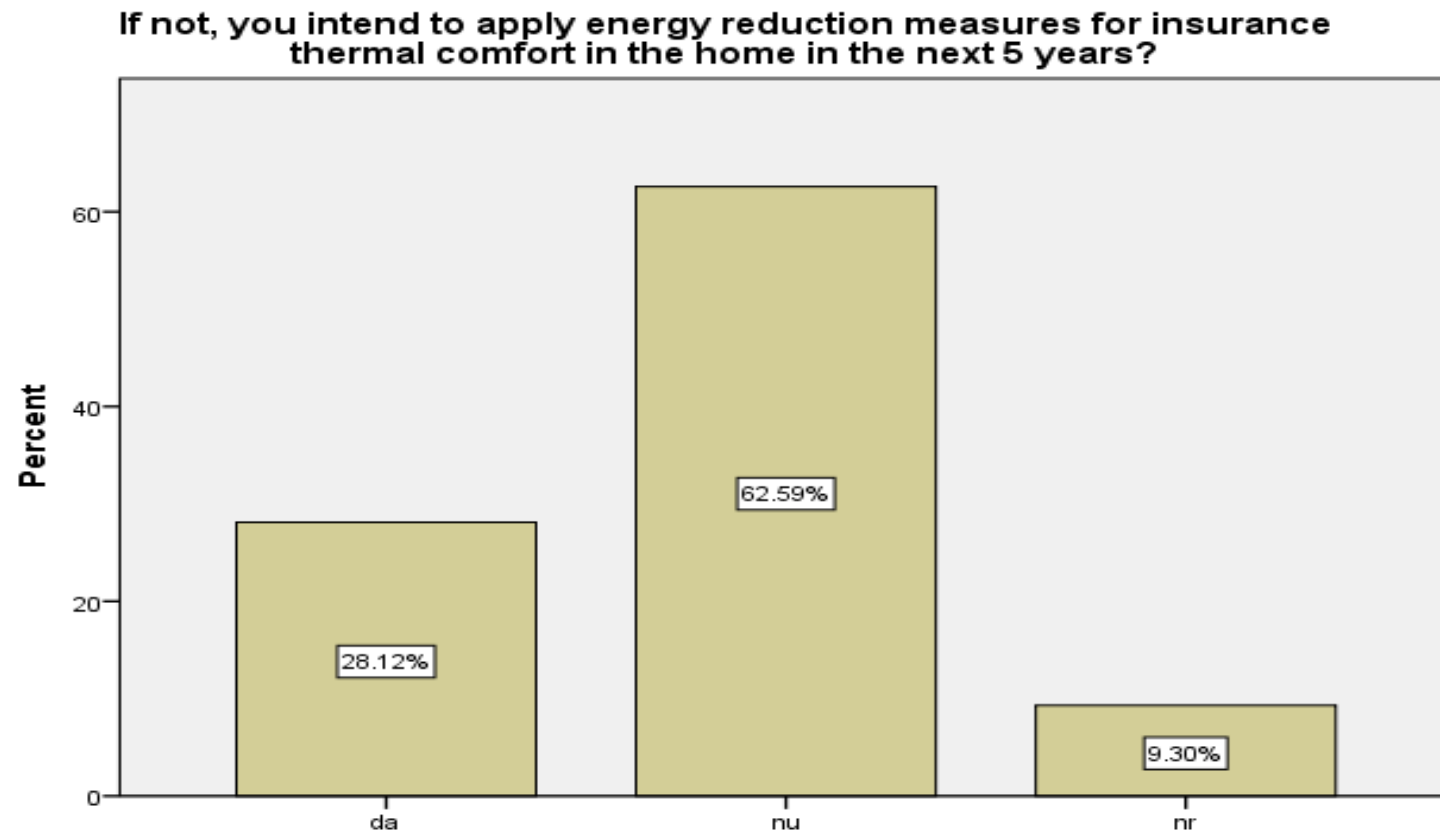
10. If yes, how were these measures applied?



11. Do you think that these measures have improved the thermal comfort of your home?



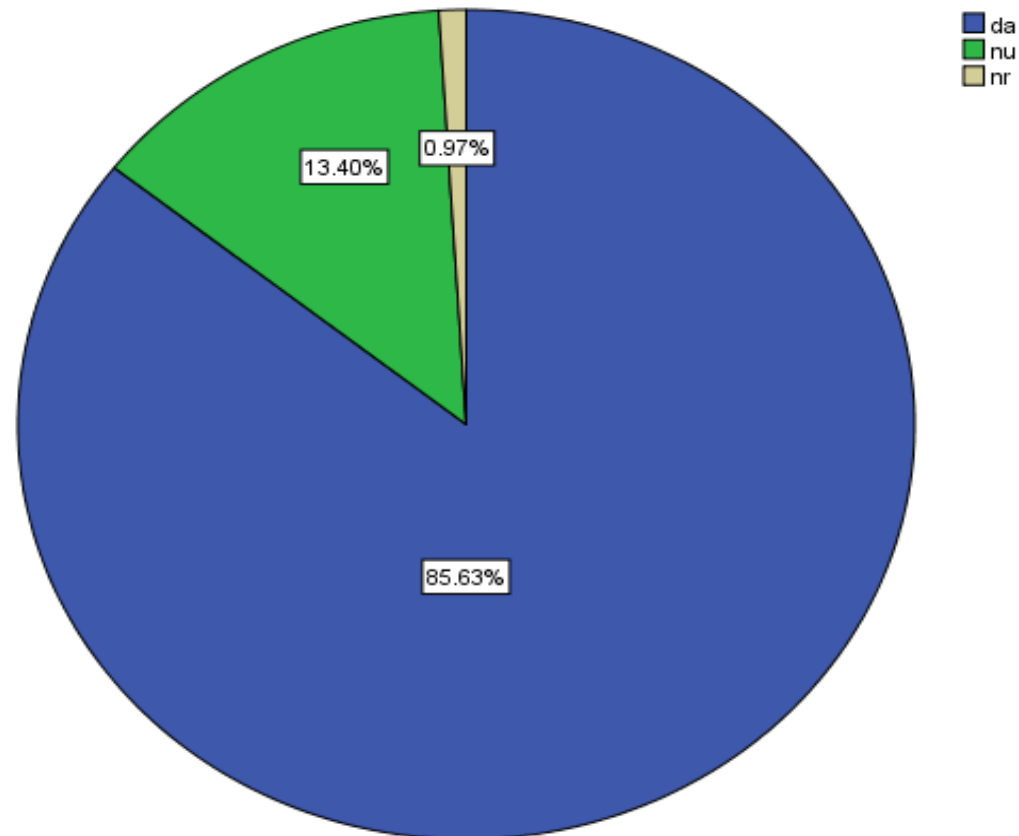
12. If not, do you intend to apply energy reduction measures for insurance thermal comfort in the home in the next 5 years?



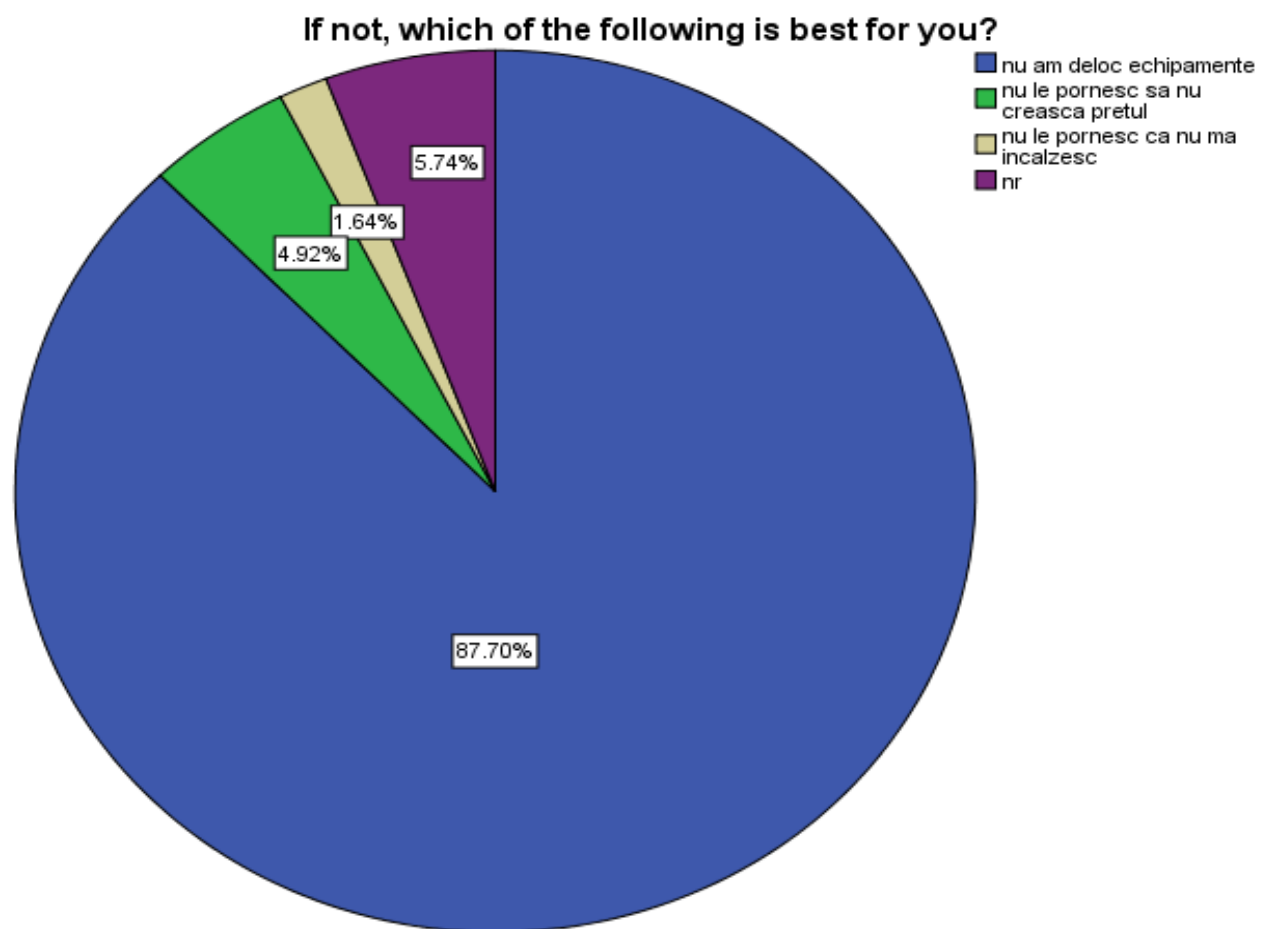


13. You have the necessary technical equipment to raise the temperature on a winter day where you feel it's too cold in the house?

You have the necessary technical equipment to raise the temperature on a winter day where you feel it's too cold in the house?

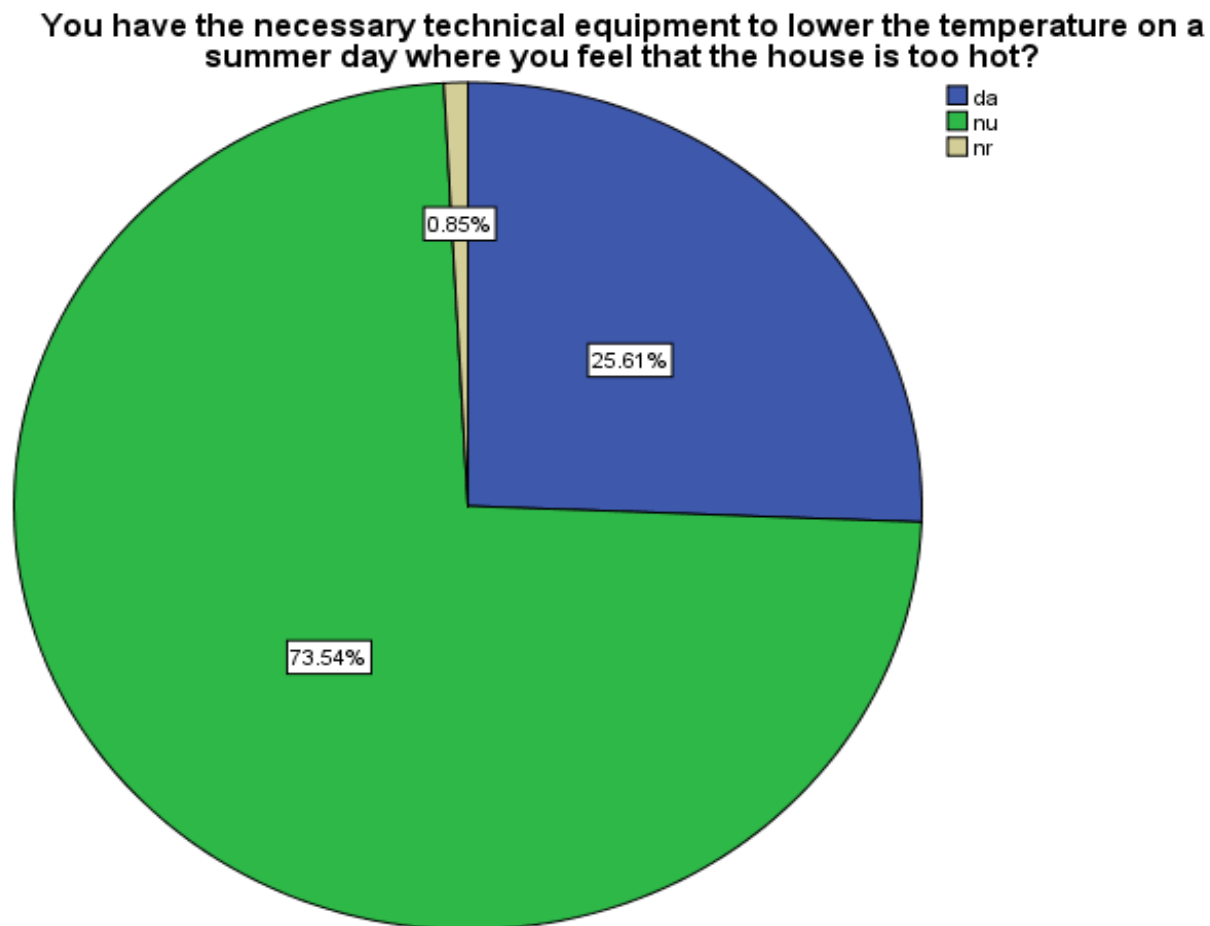


14. If not, which of the following is best for you?

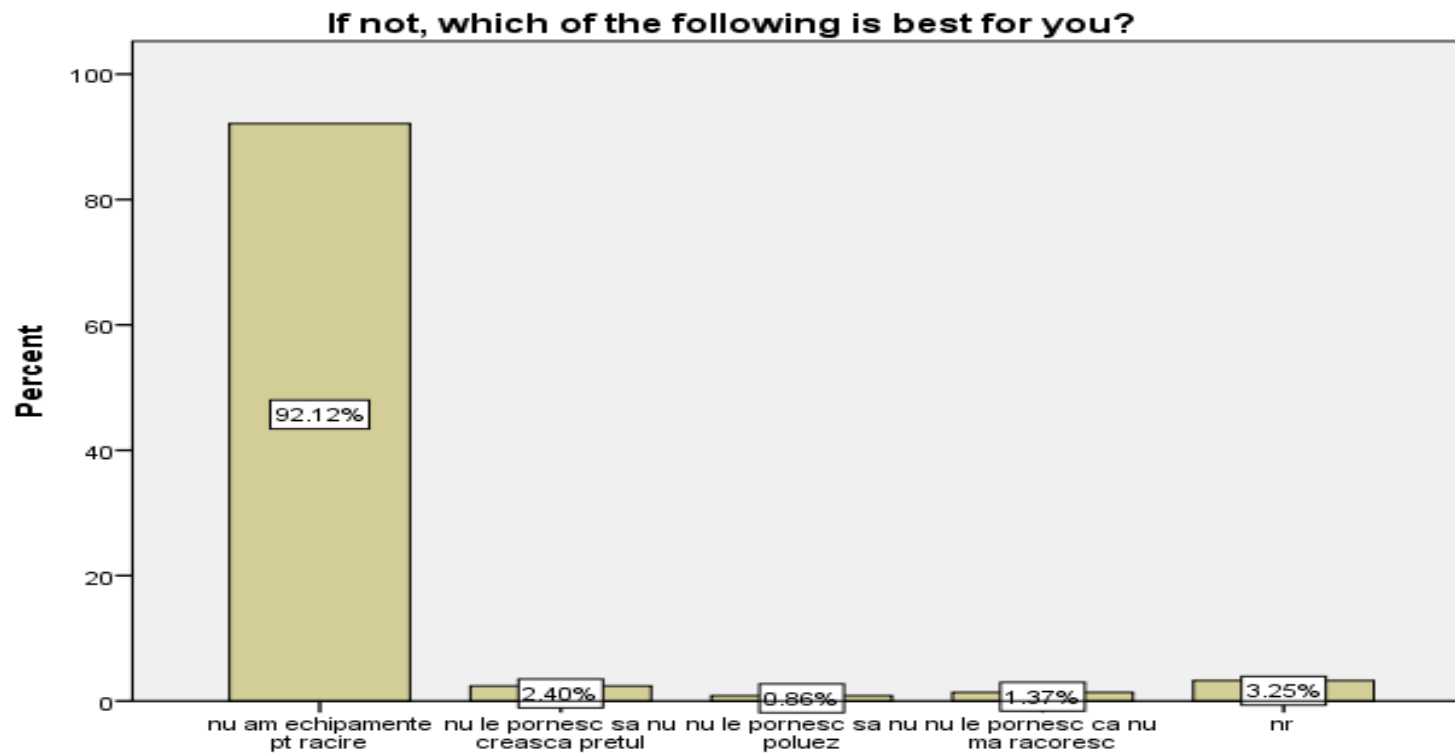




15. You have the necessary technical equipment to lower the temperature on a summer day where you feel that the house is too hot?

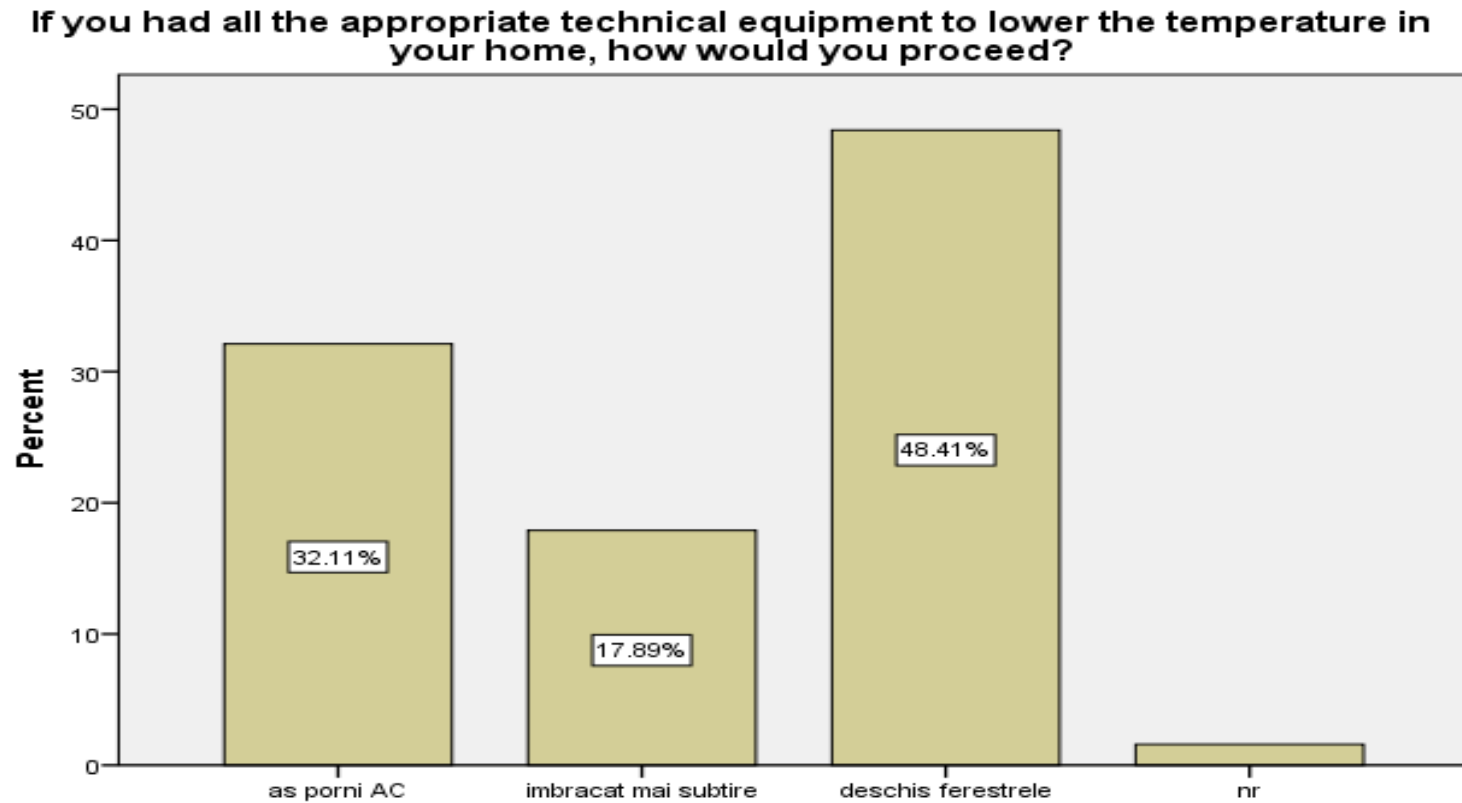


16. If not, which of the following is best for you?



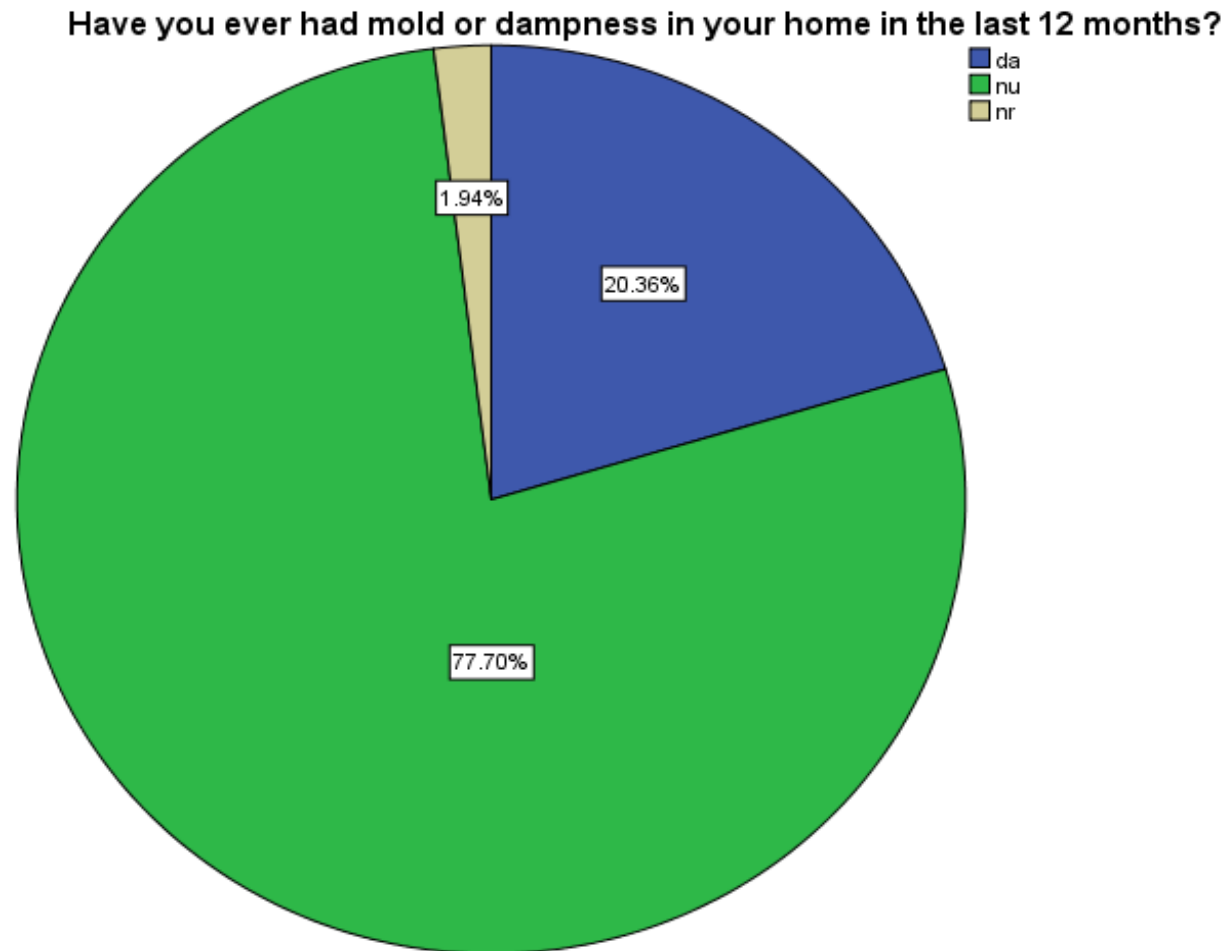


17. If you had all the appropriate technical equipment to lower the temperature in your home, how would you proceed?





18. Have you ever had mold or dampness in your home in the last 12 months?





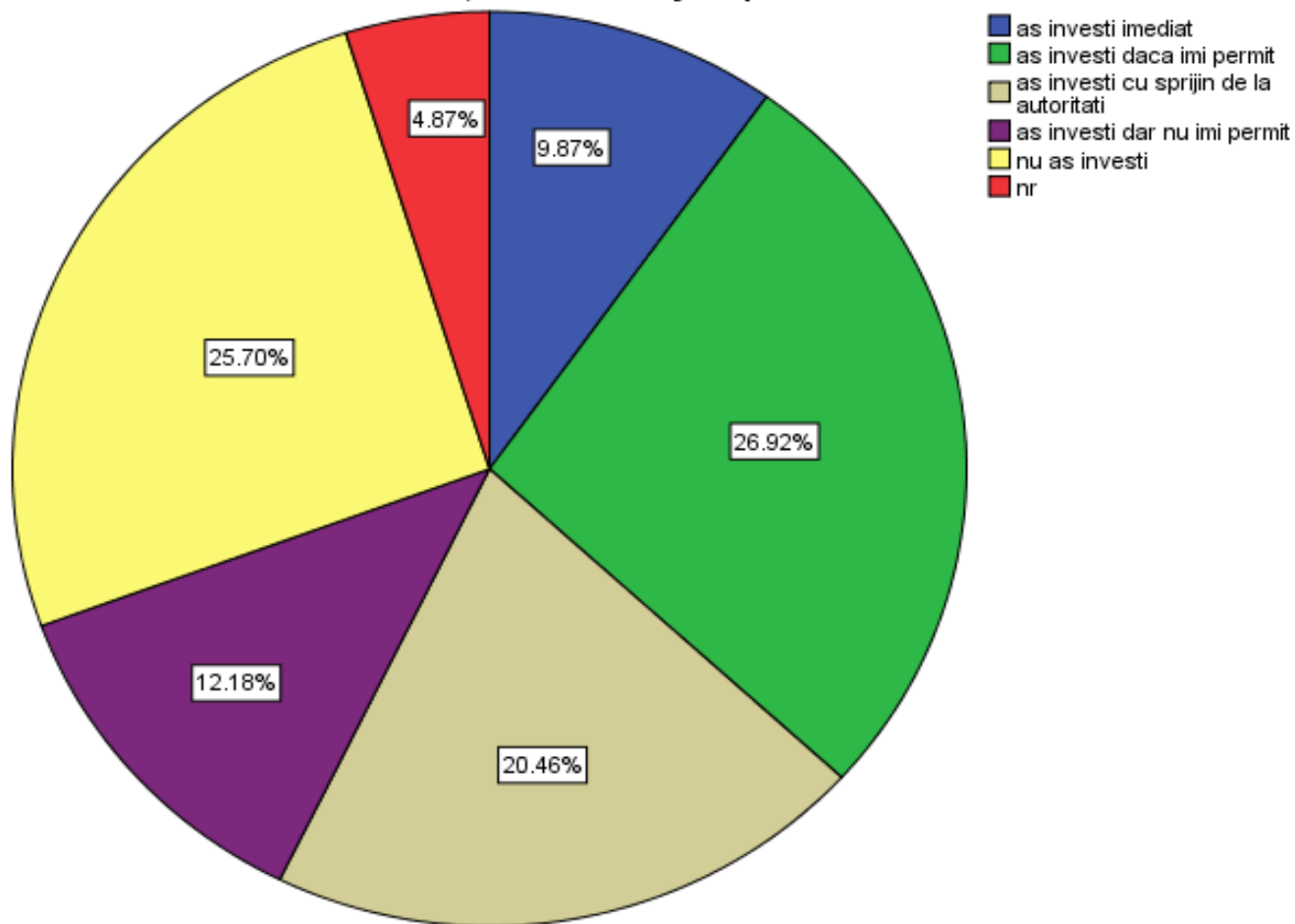
19. Which of the following categories of current expenses do you consider to be a priority in your household? Please choose only 3 options.

Which of the following categories of current expenses do you consider to be a priority in your household? Please choose only 3 options.

	I don't know	No	Yes
Books, school supplies, school expenses	0.48	87.65	11.38
Clothes, shoes	0.48	82.81	16.22
Consultations, medical tests	0.48	81.60	17.43
Drugs	0.48	83.17	15.86
Electricity	0.48	38.26	60.77
Internet subscription, cable TV	0.48	80.39	18.64
Maintenance costs	0.48	22.15	76.88
Payment of the gas bill	0.48	36.56	62.47
Rent	0.48	81.96	17.07

20. If you had the opportunity to make an investment in another type of heating or fuel, how would you proceed?

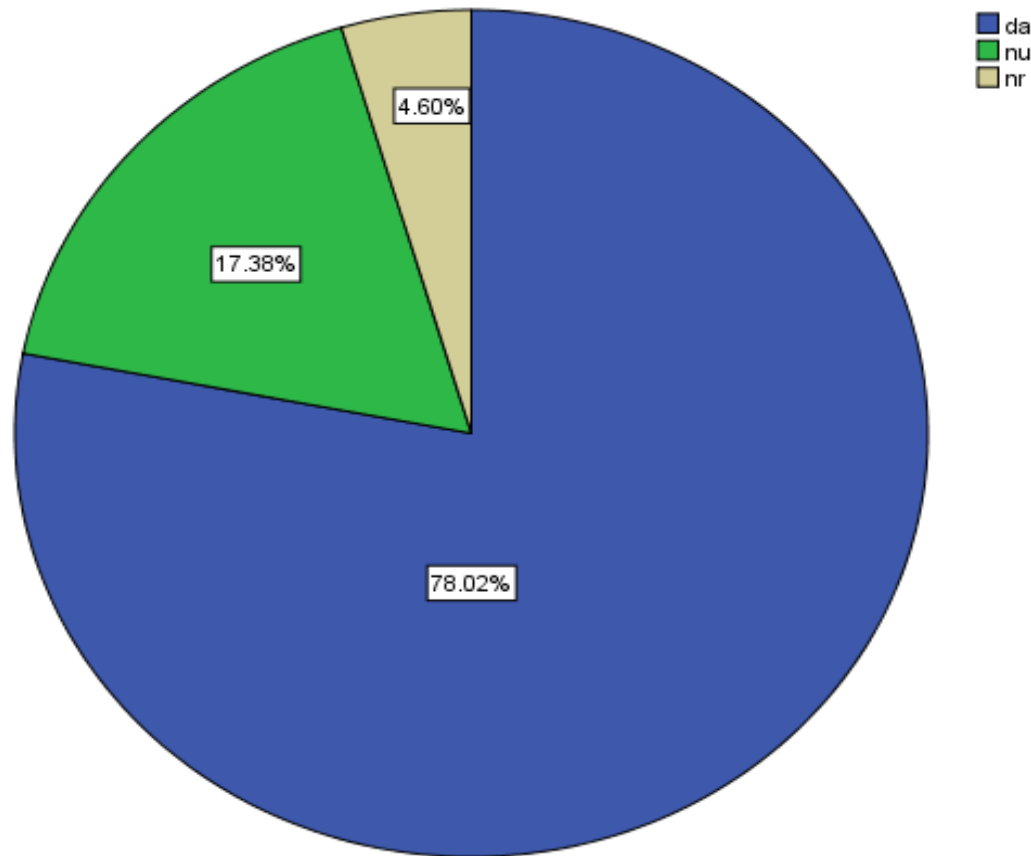
If you had the opportunity to make an investment in another type of heating or fuel, how would you proceed?





21. If they invested, would you be willing to invest if investing or using new equipment involved cooperating with neighbors?
(eg when the block is turned on or off)

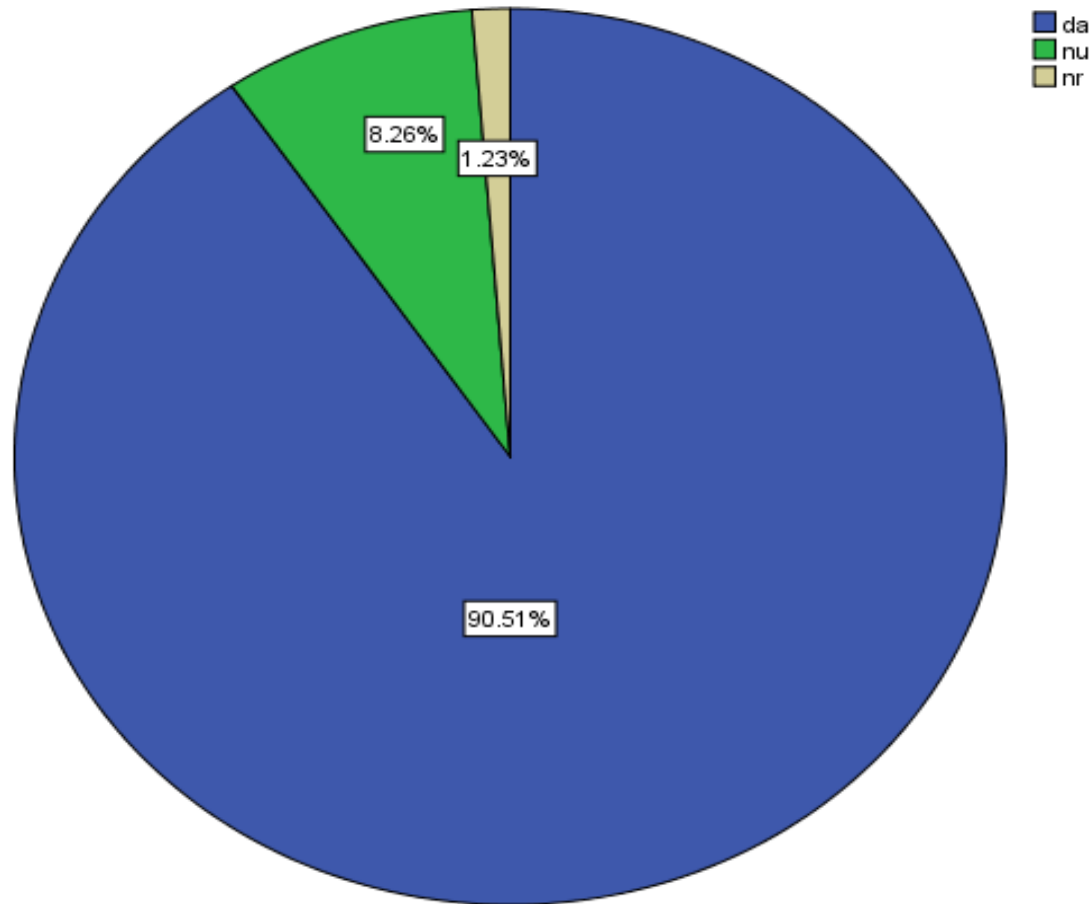
If they invested, would you be willing to invest if investing or using new equipment involved cooperating with neighbors? (eg when the block is turned on or off)



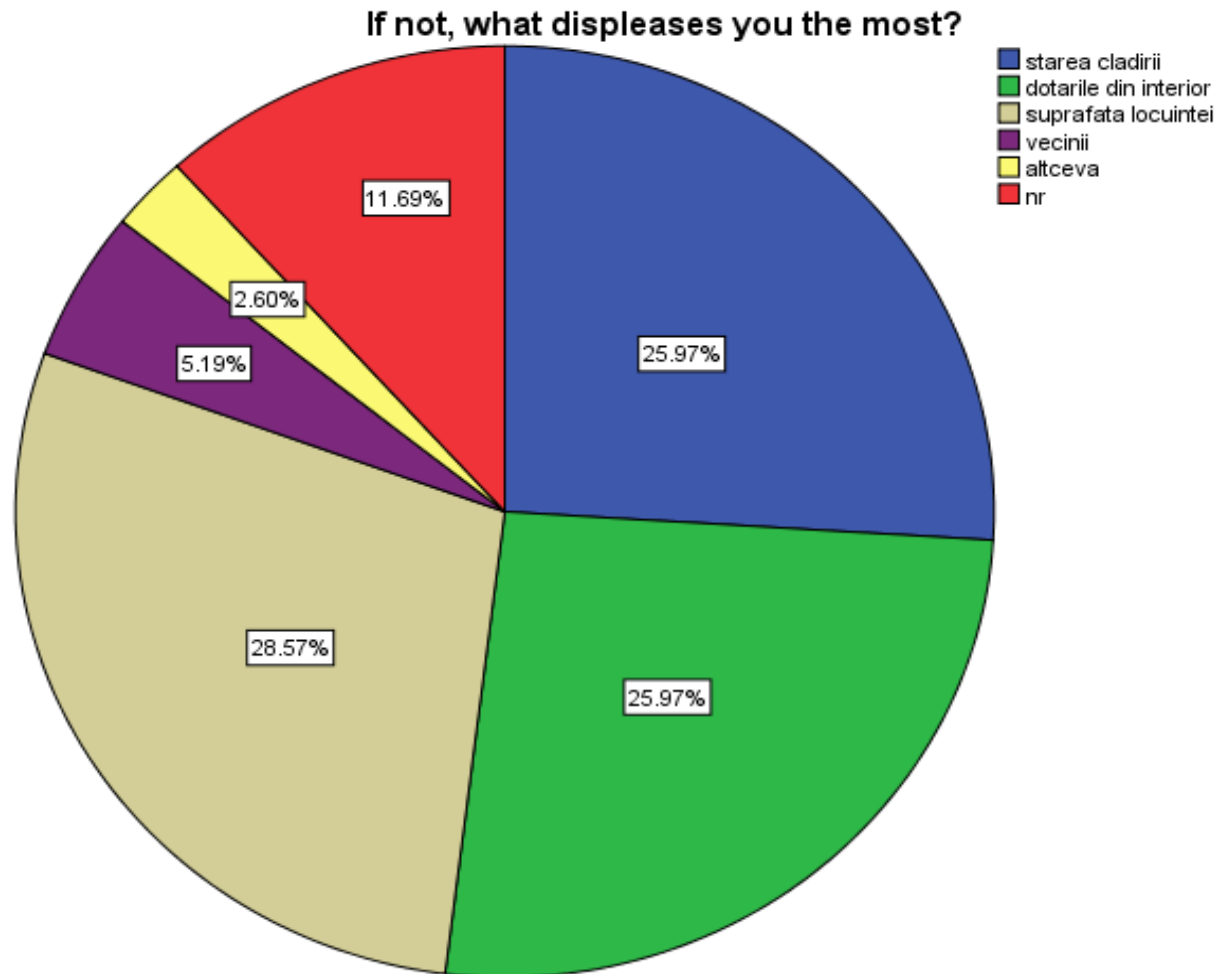


22. Thinking about the condition of the house, do you consider that it meets your needs?

Thinking about the condition of the house, do you consider that it meets your needs?

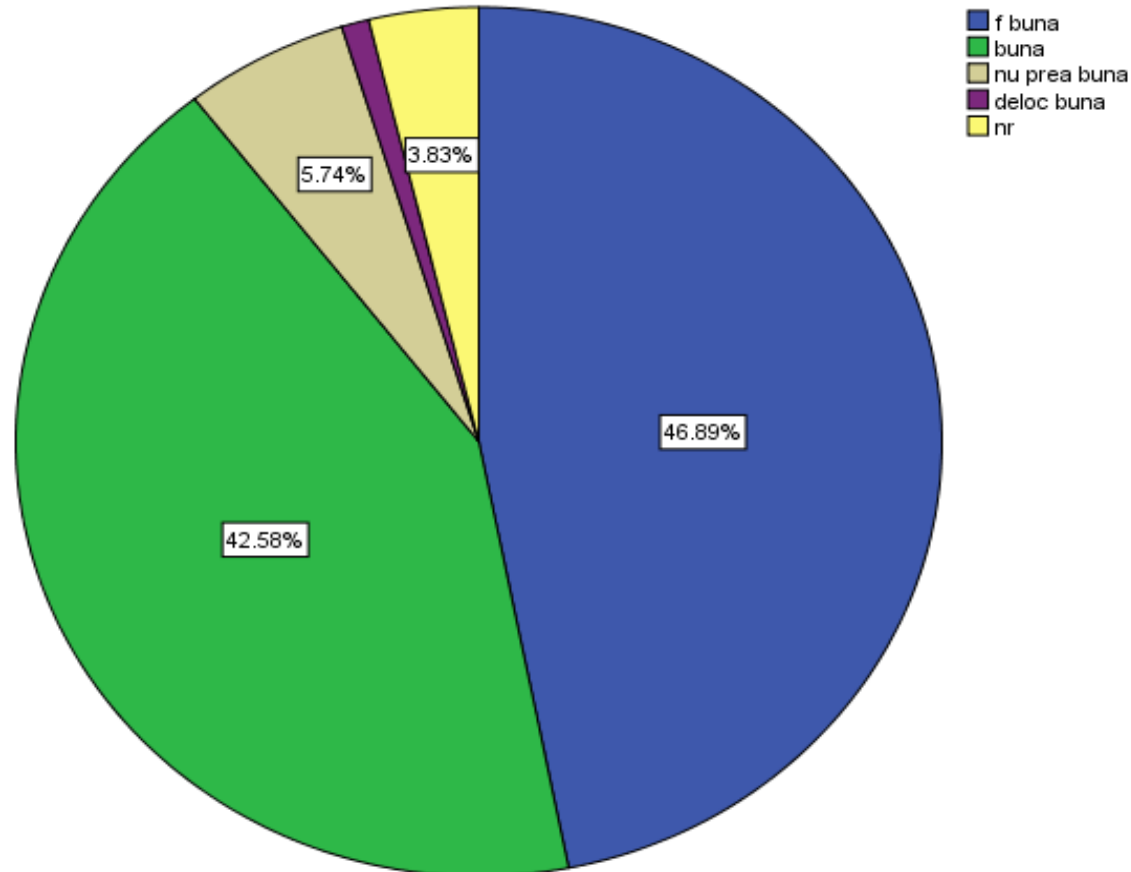


23. If not, what displeases you the most?

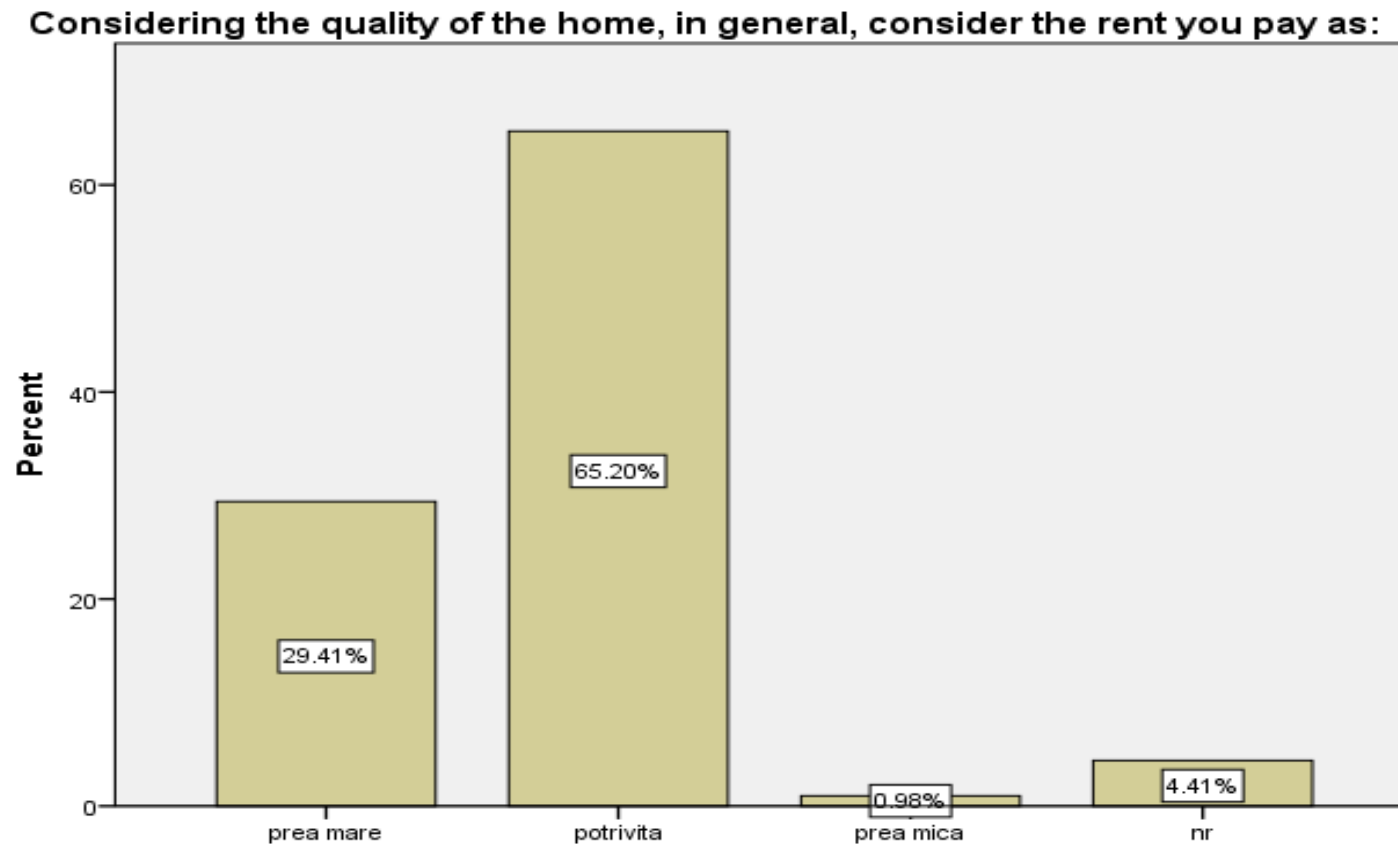


24. If the dwelling is rented or not the respondent lives with the owner, how do you evaluate the relationship with the owner regarding aspects of home state?

If the dwelling is rented or not the respondent lives with the owner, how do you evaluate the relationship with the owner regarding aspects of home state?



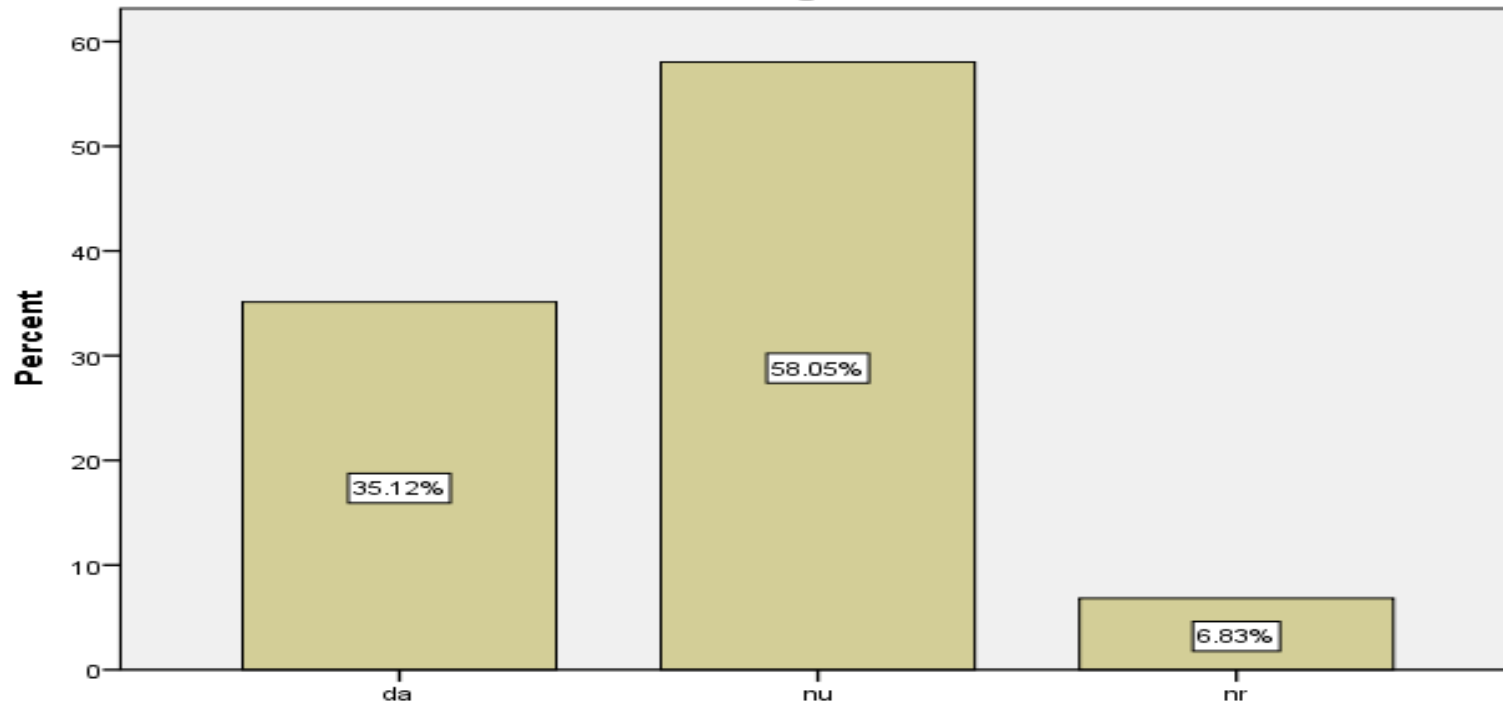
25. Considering the quality of the home, in general, consider the rent you pay as:





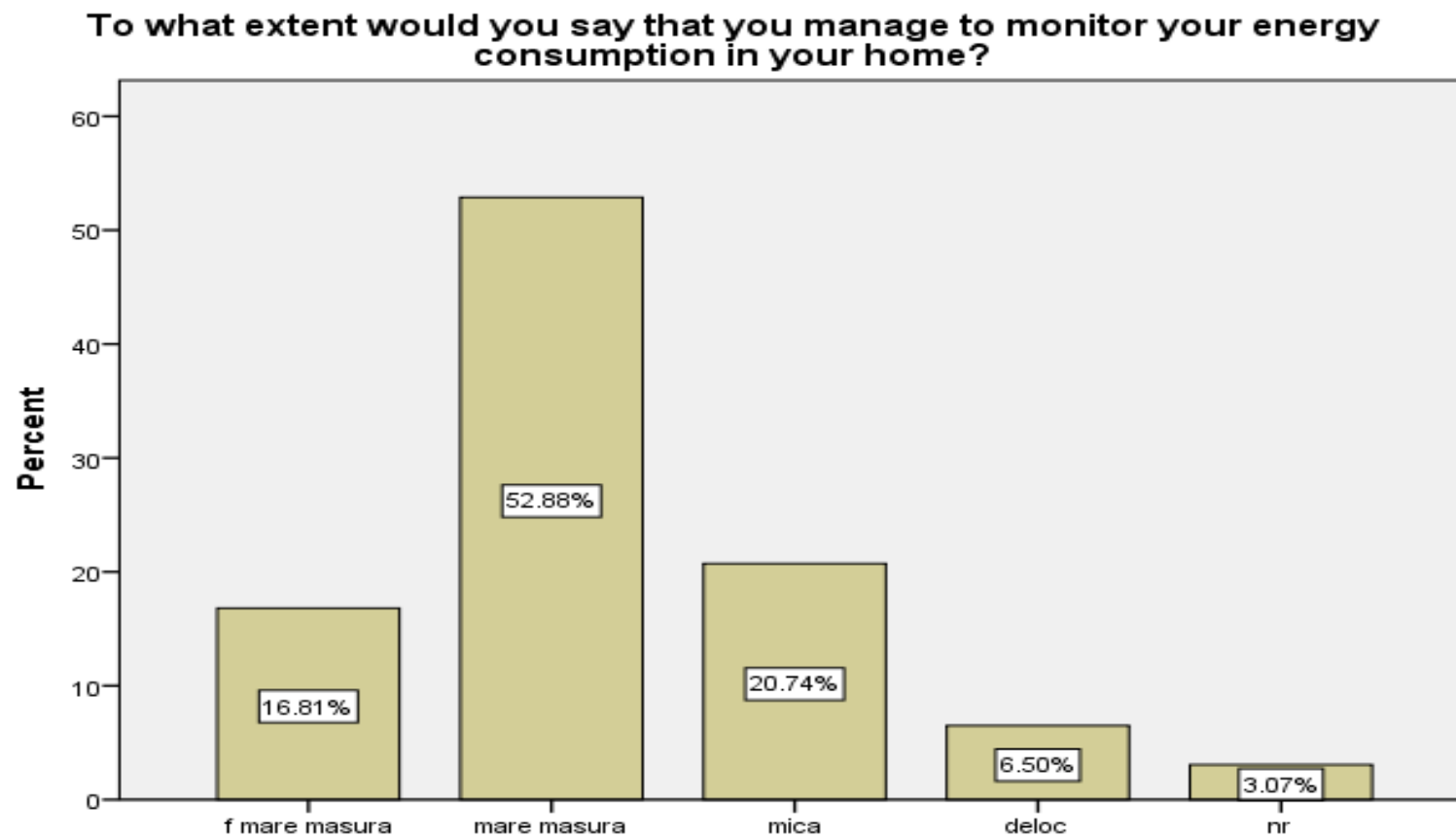
26. Would you be willing to pay a higher rent if it meant an increase in the quality of housing?

Would you be willing to pay a higher rent if it meant an increase in the quality of housing?



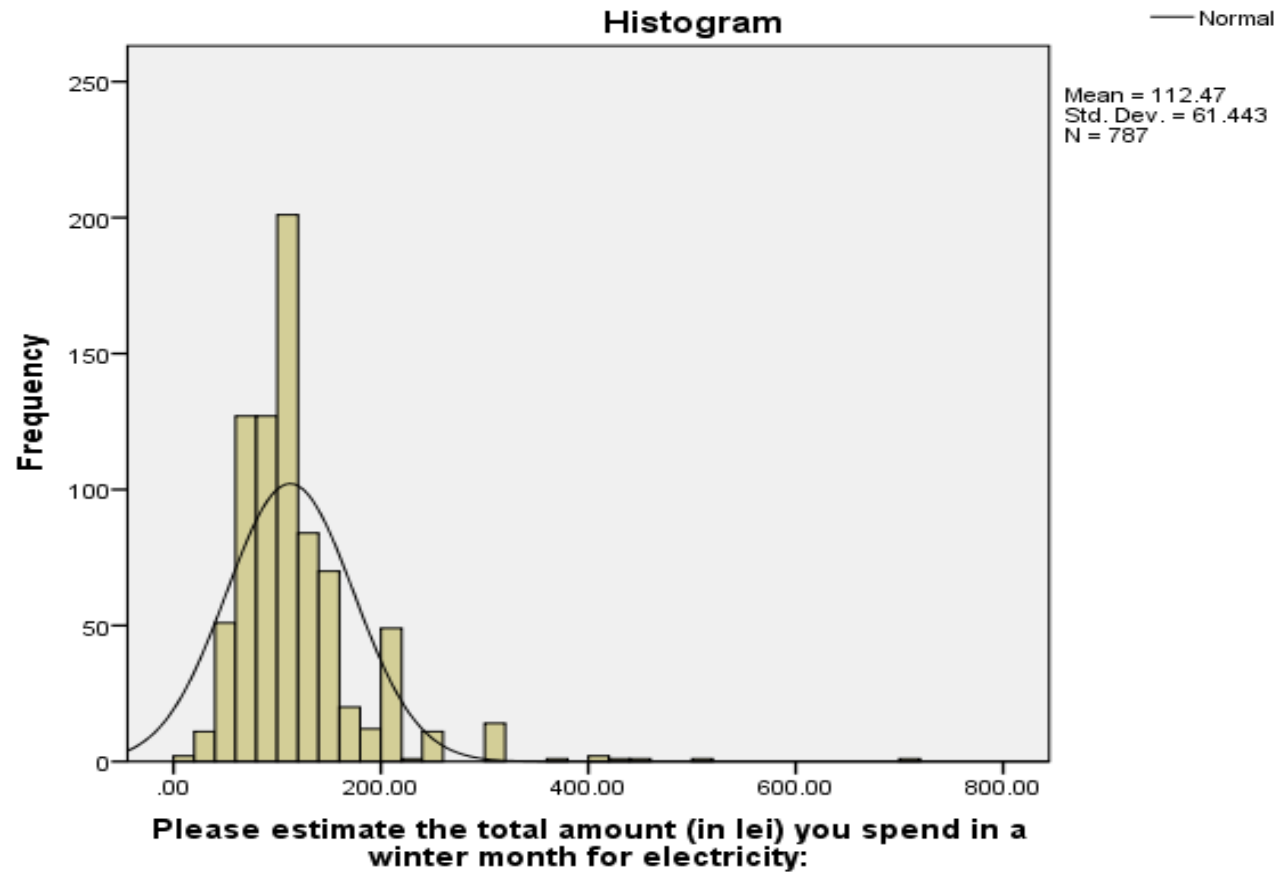


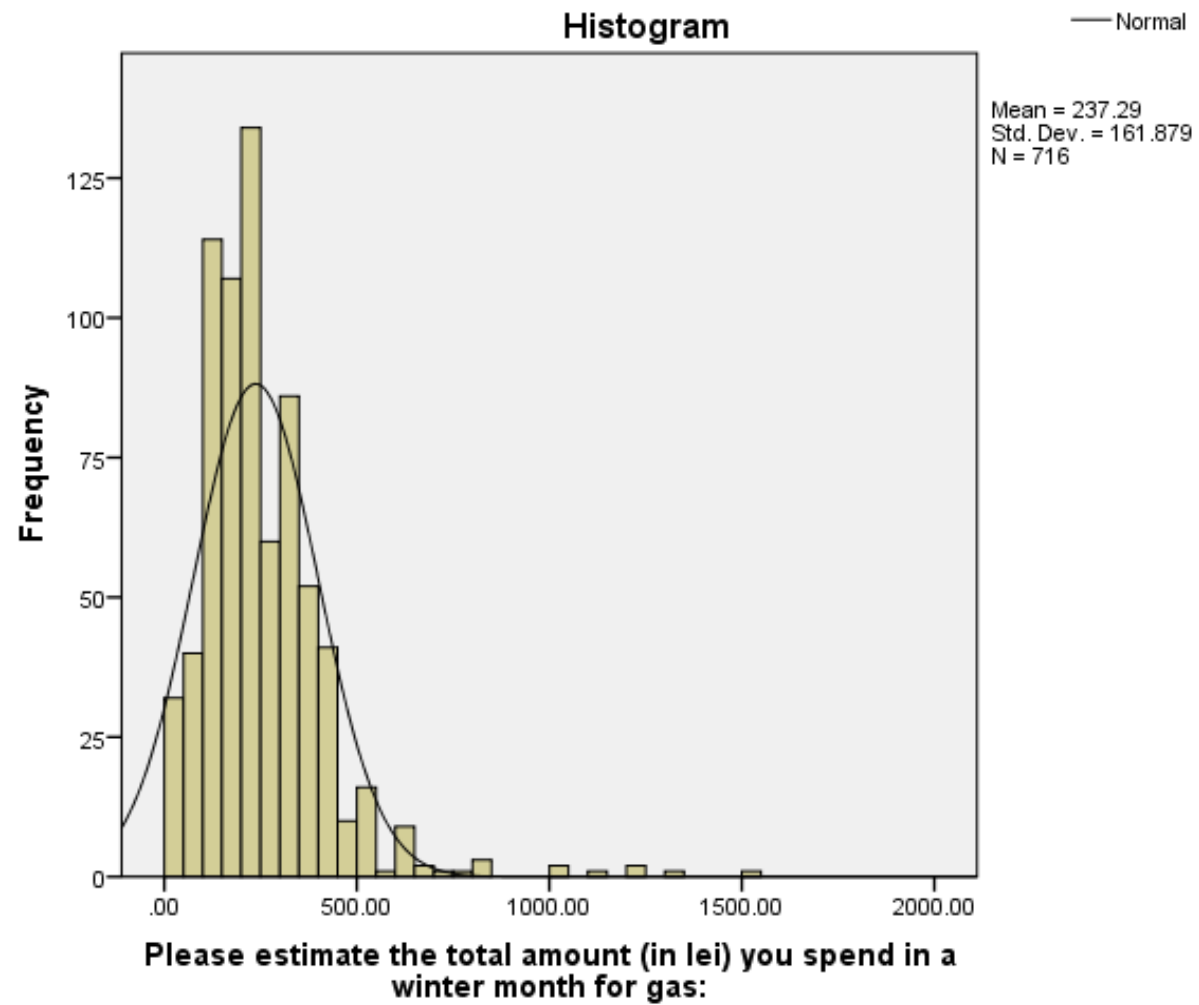
27. To what extent would you say that you manage to monitor your energy consumption in your home?

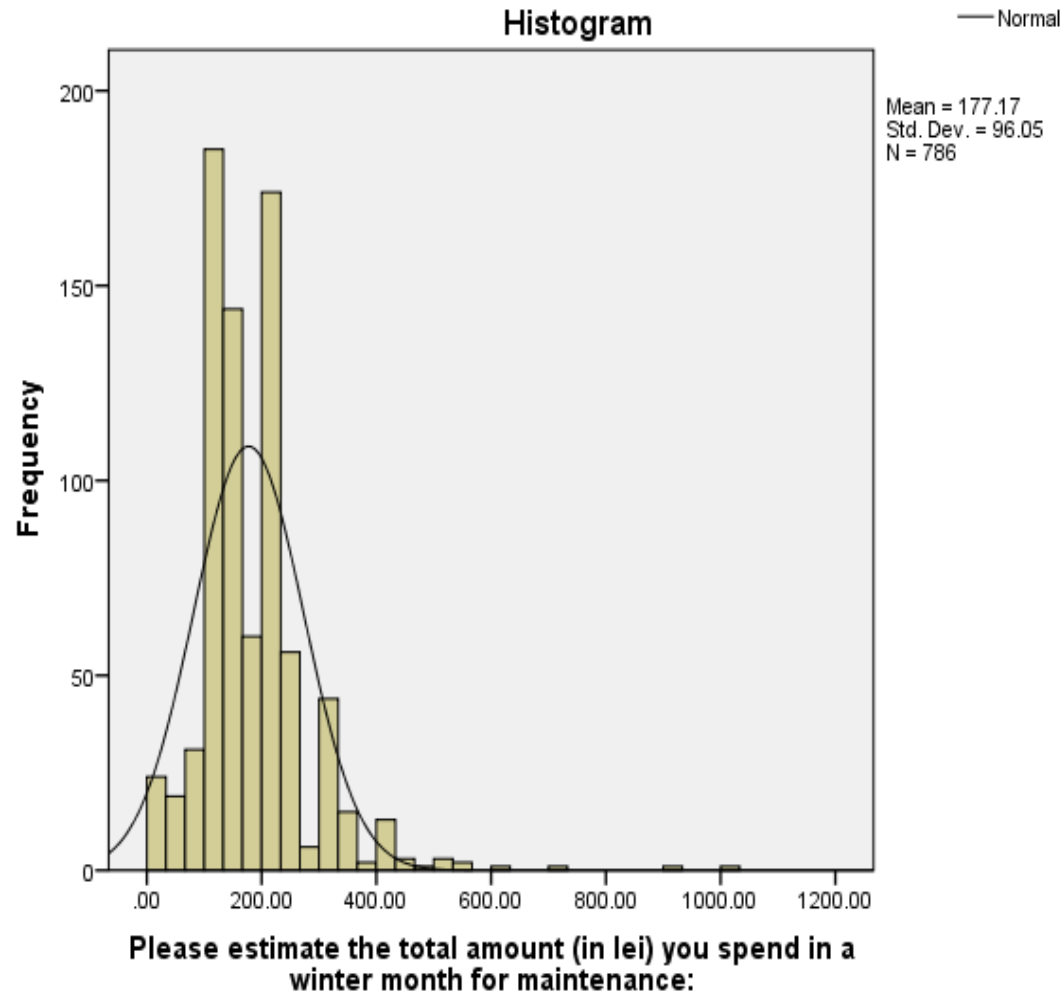


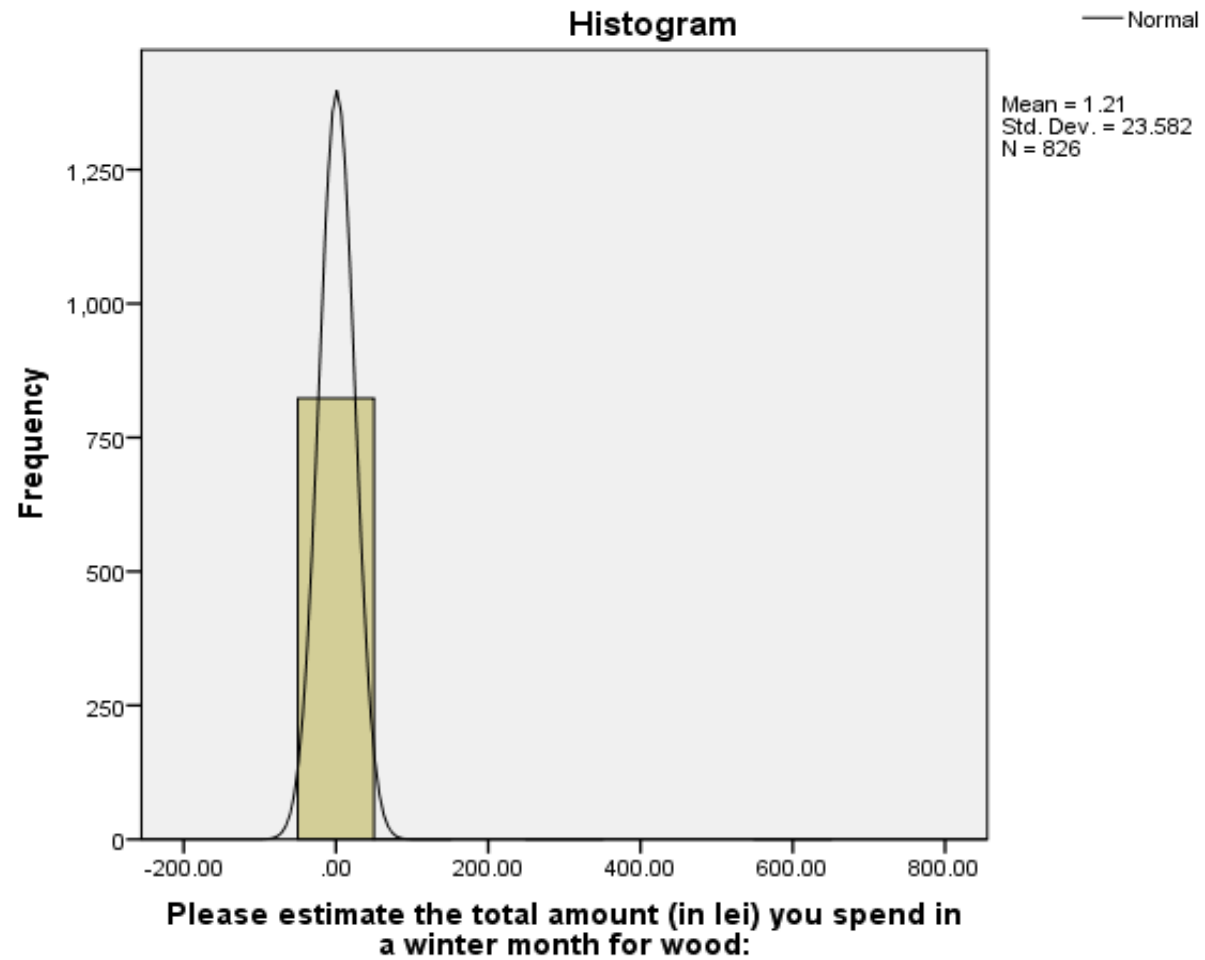


28. Please estimate the total amount (in lei) you spend in a winter month for:



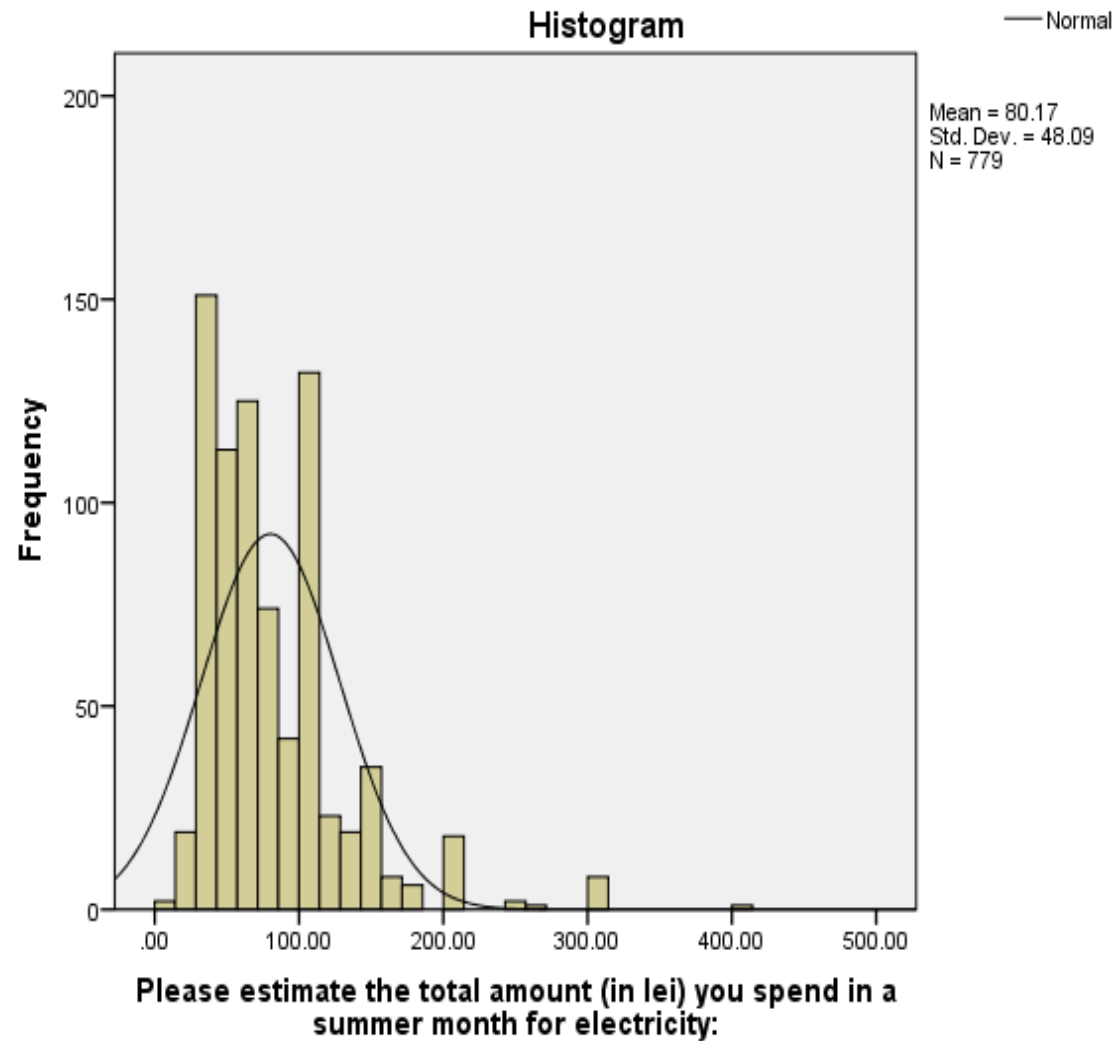


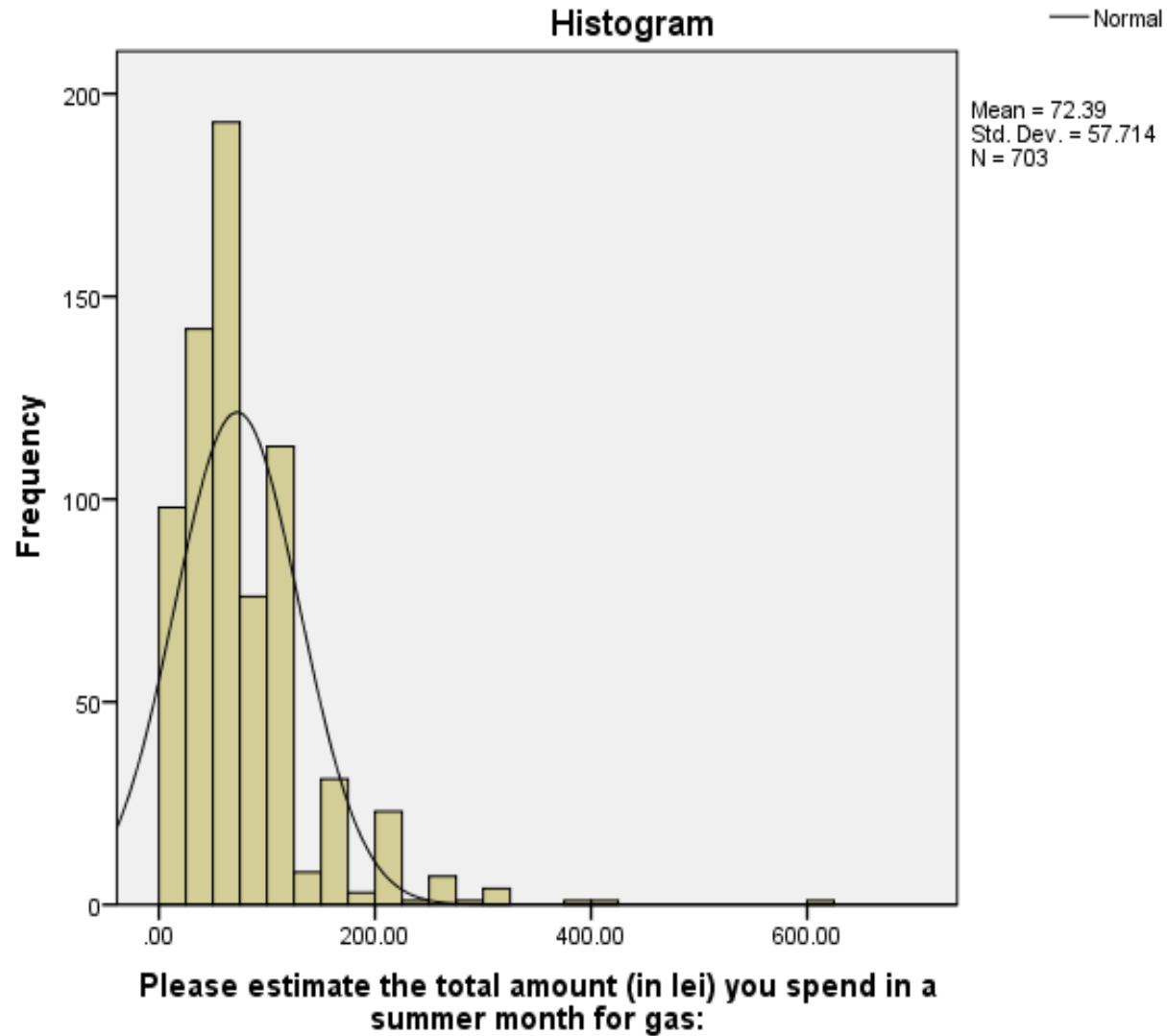


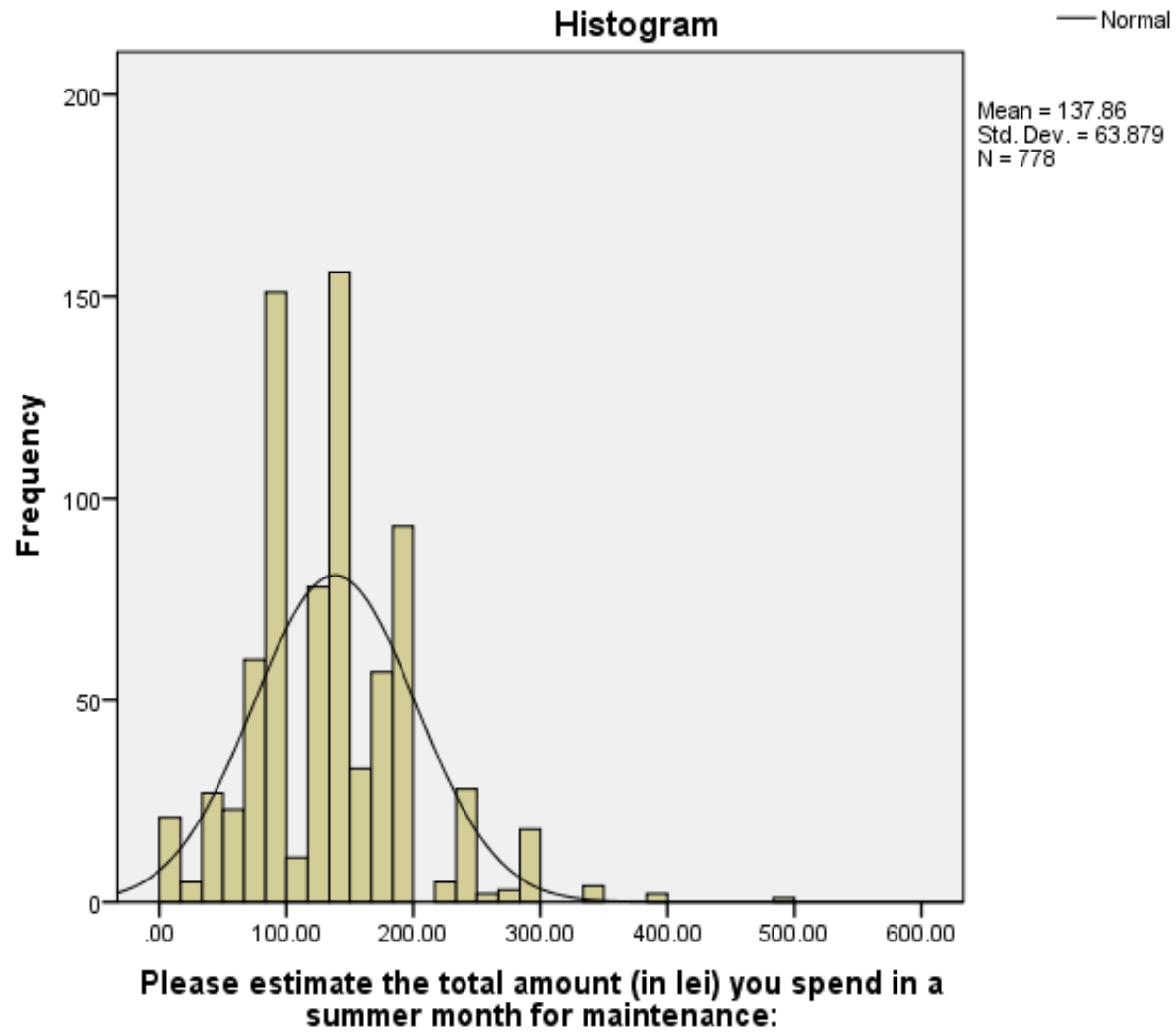


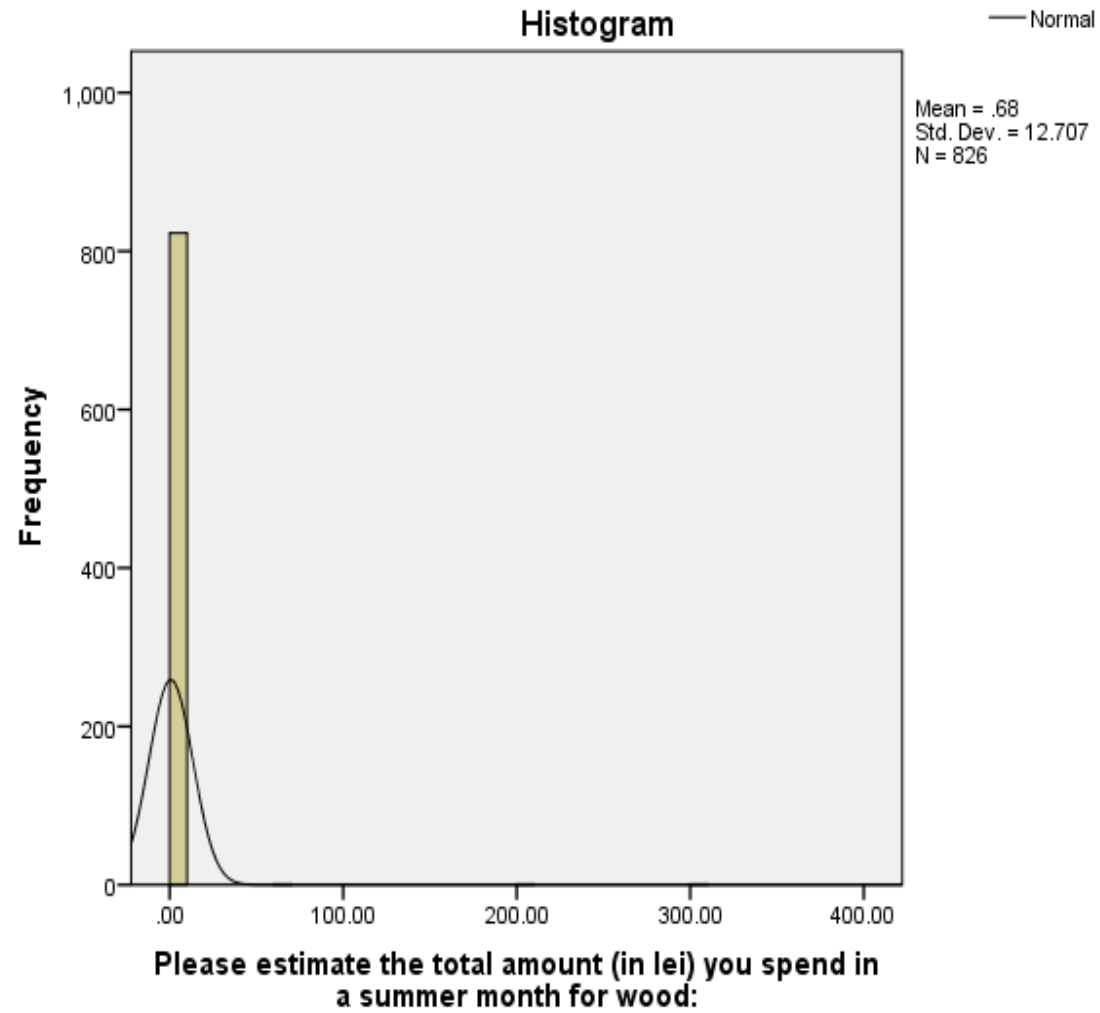


29. Please estimate the total amount (in lei) you spend in a summer month for:



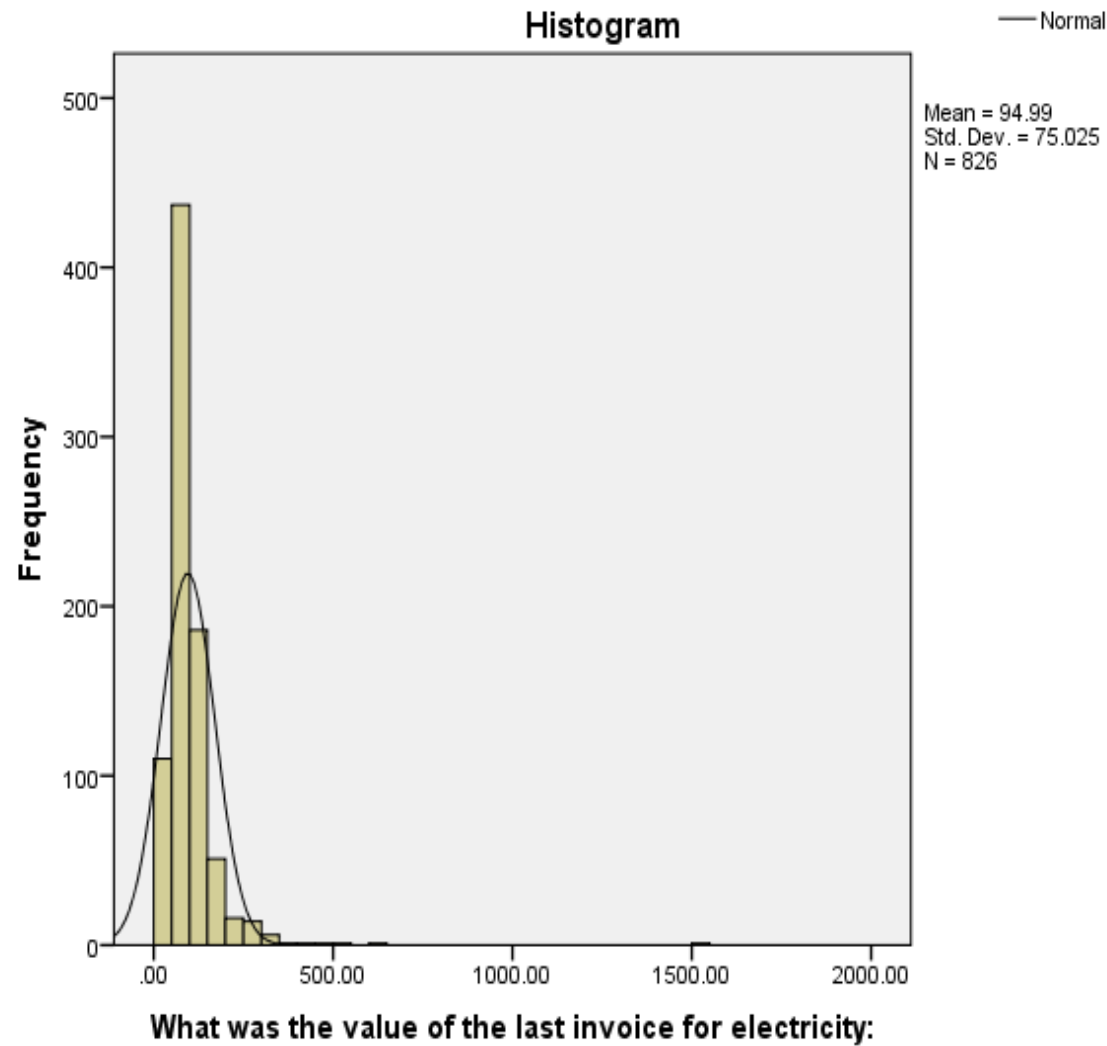


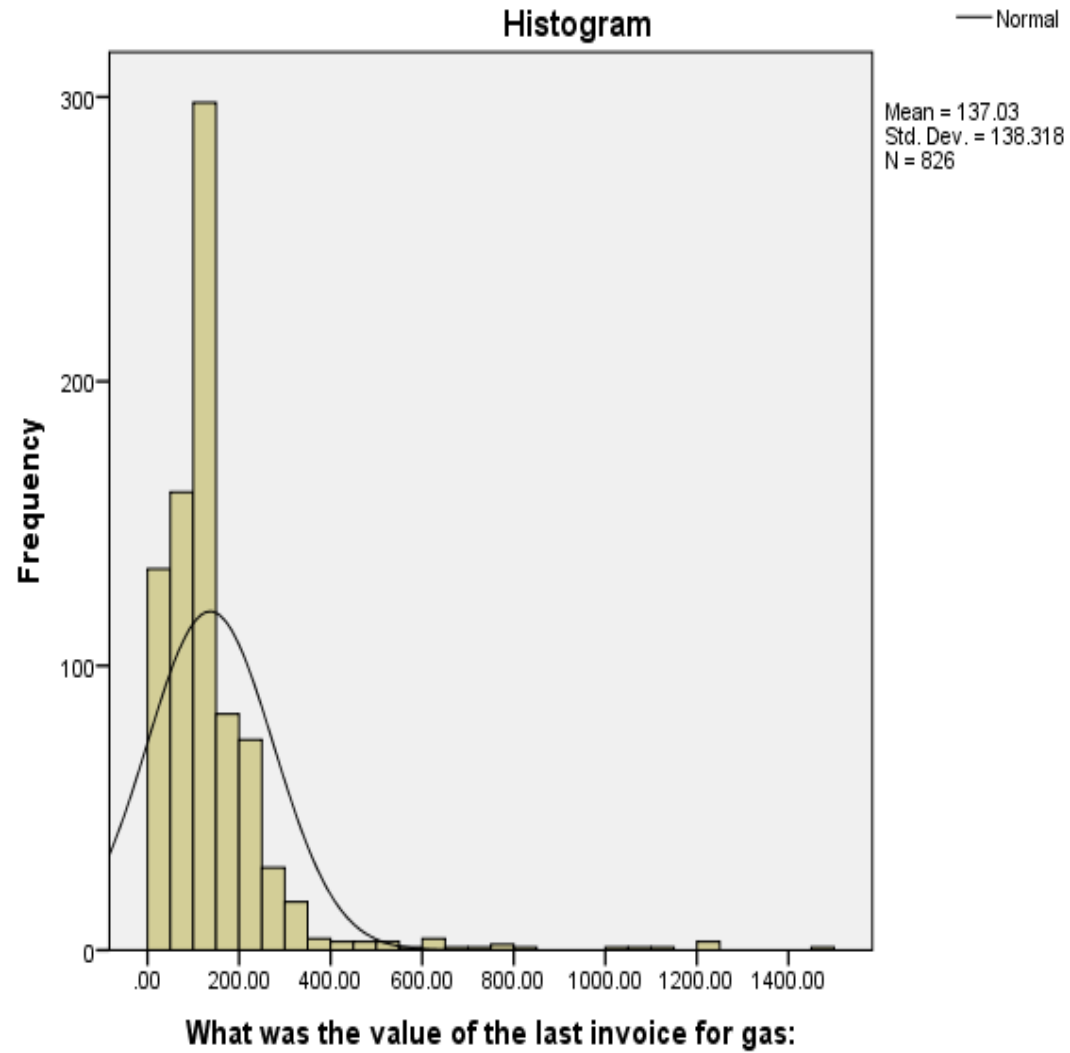


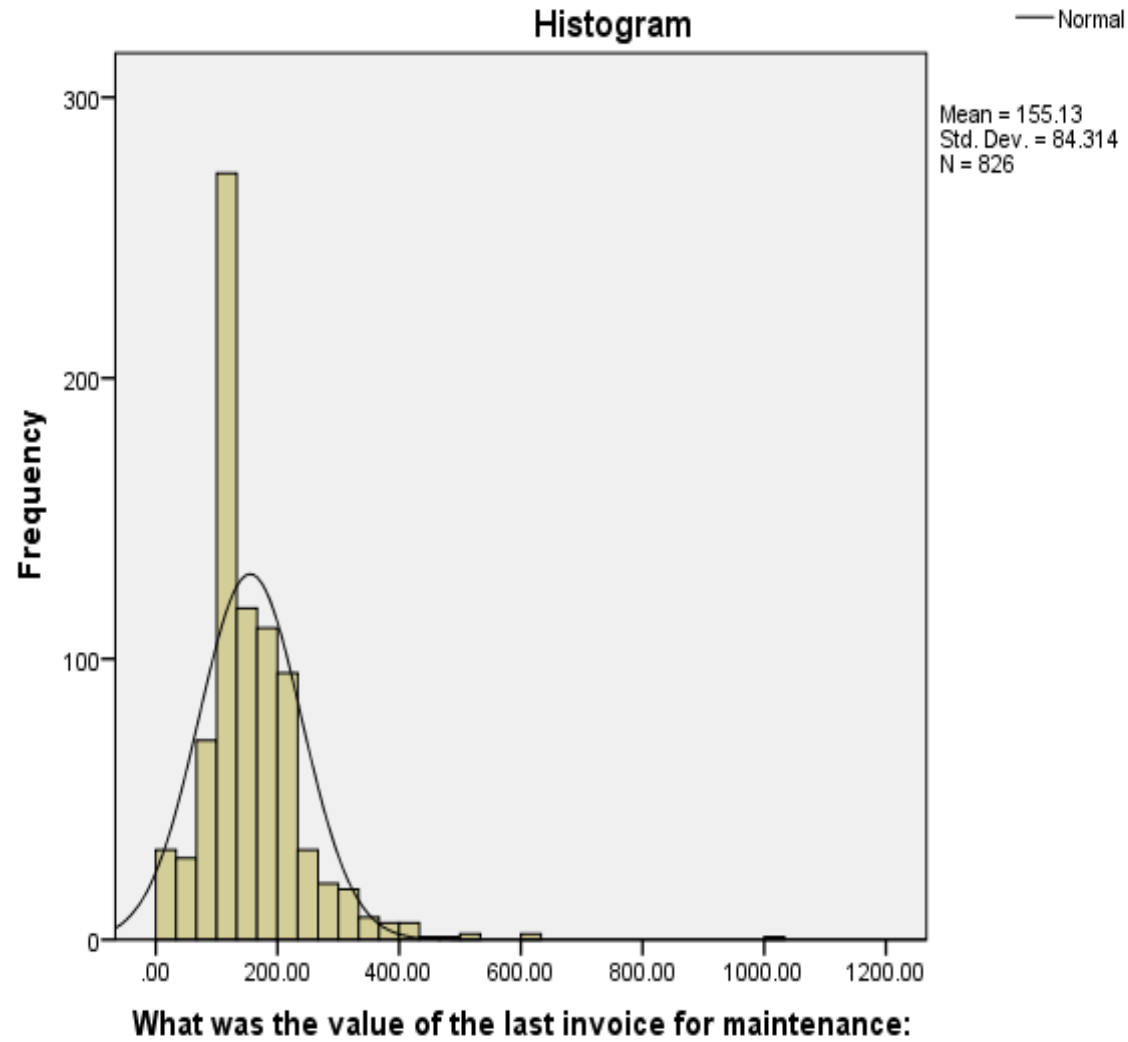


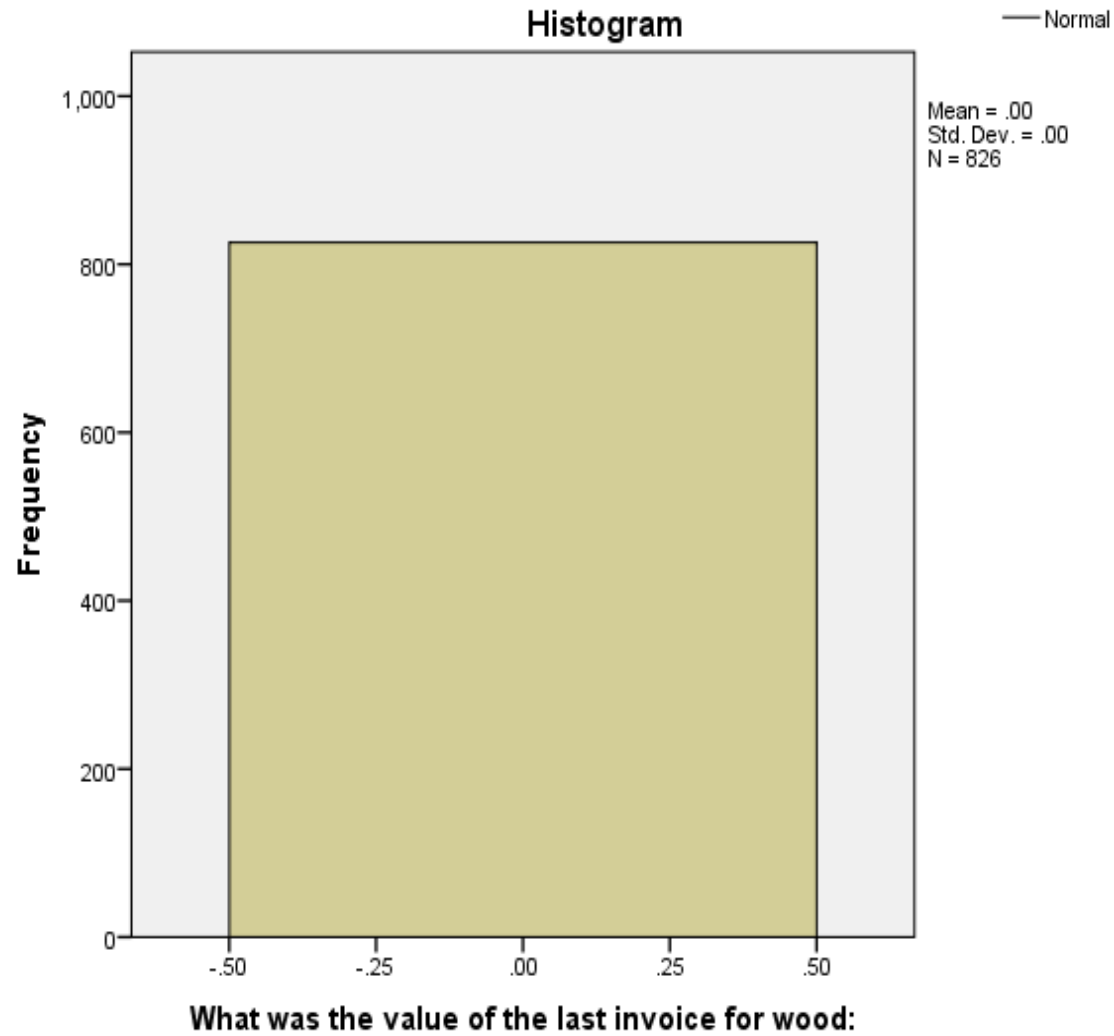


30. What was the value of the last invoice for:

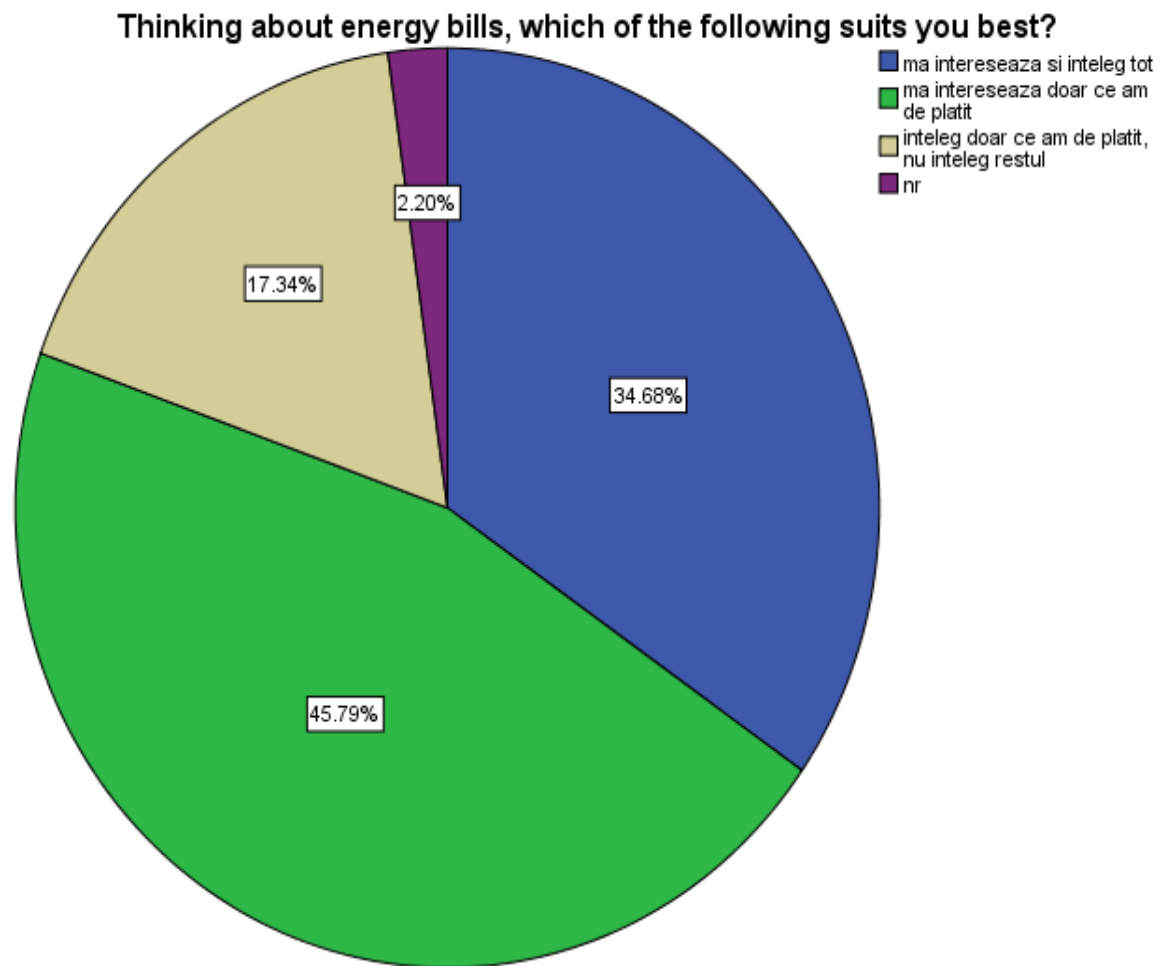








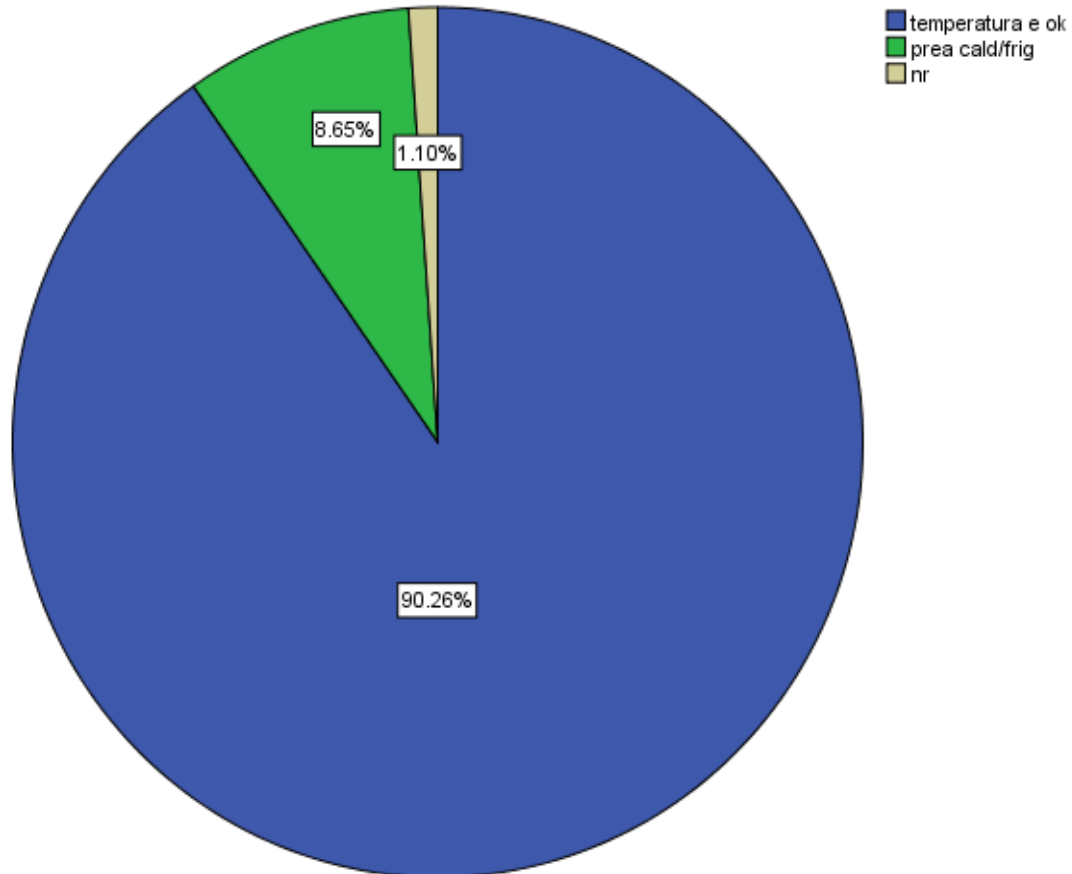
31. Thinking about energy bills, which of the following suits you best?





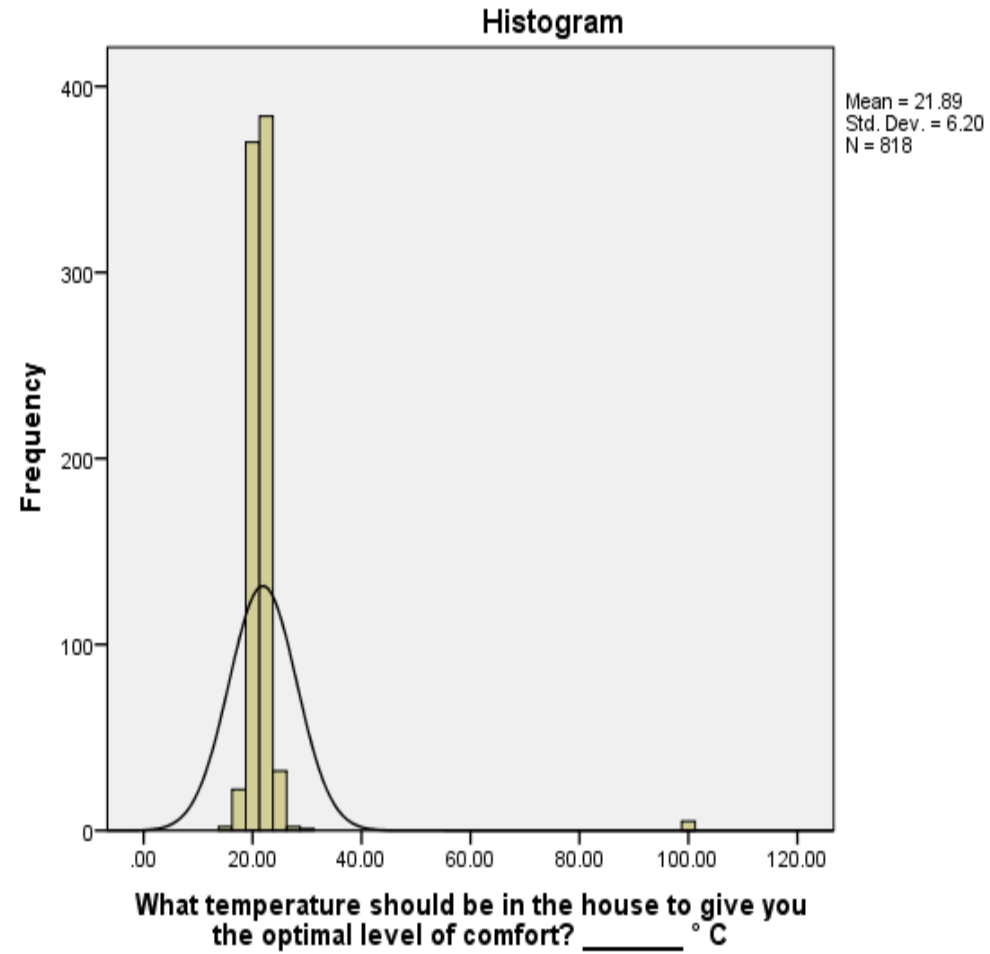
32. If you think about the level of thermal comfort that your home offers you, which of the following statements suits you best?

If you think about the level of thermal comfort that your home offers you, which of the following statements suits you best?



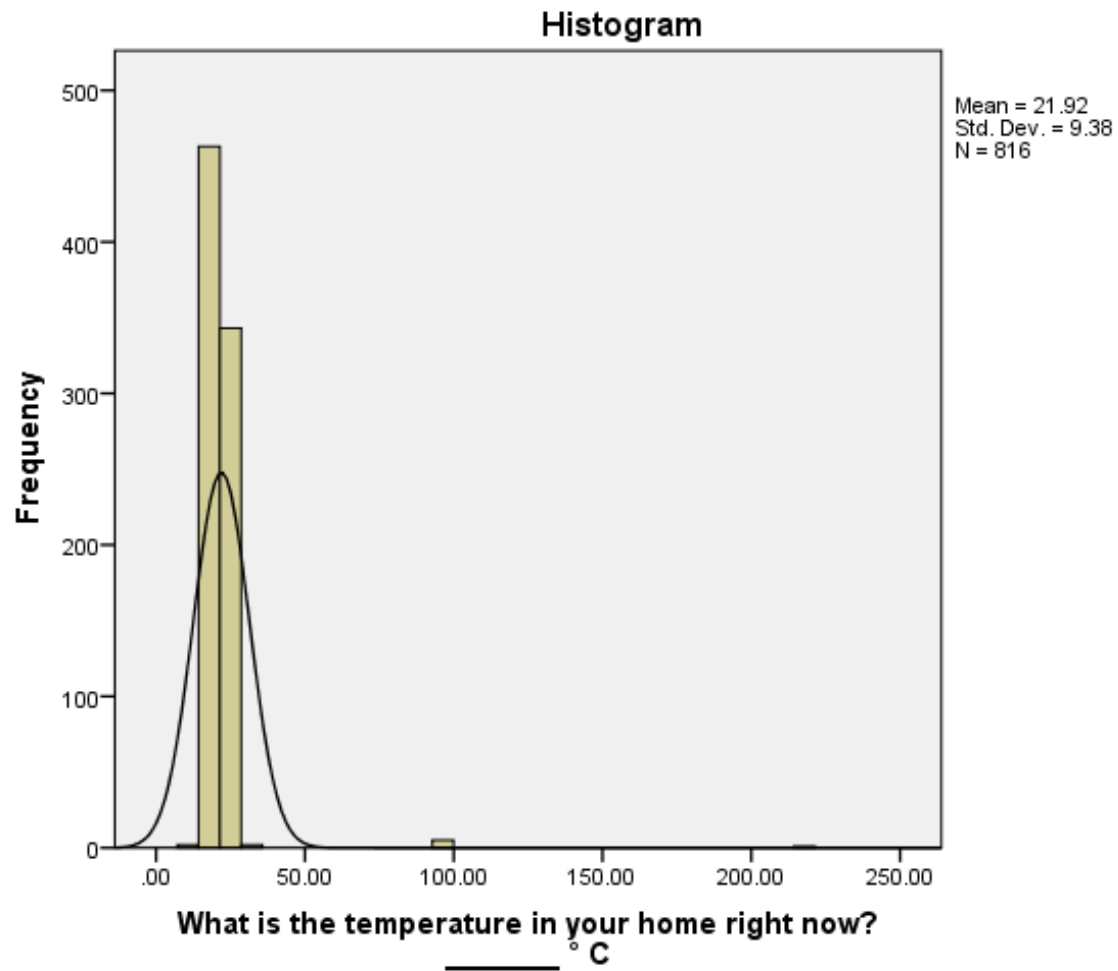


33. What temperature should be in the house to give you the optimal level of comfort? _____ ° C



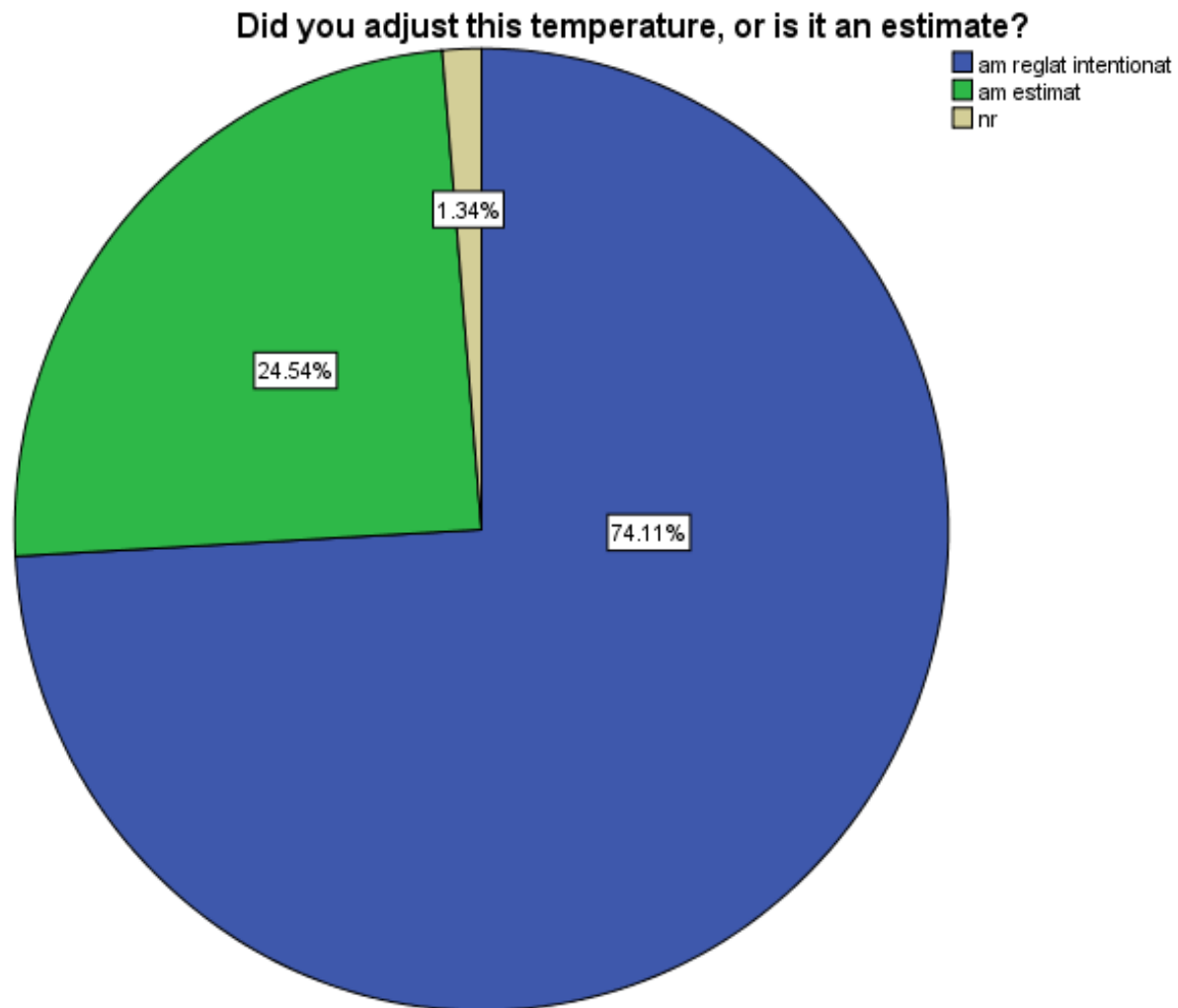


34. What is the temperature in your home right now? _____ °C

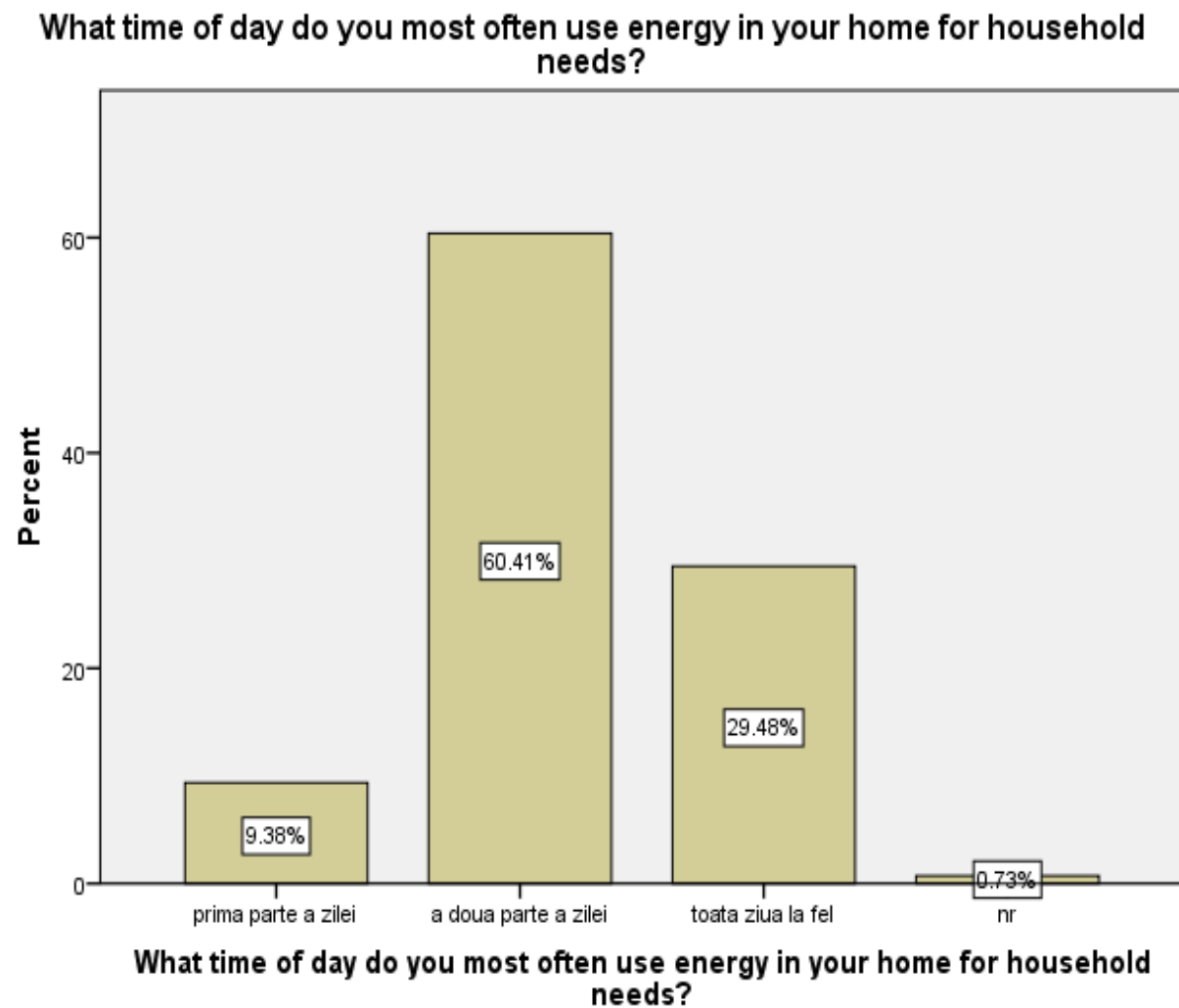




35. Did you adjust this temperature, or is it an estimate?

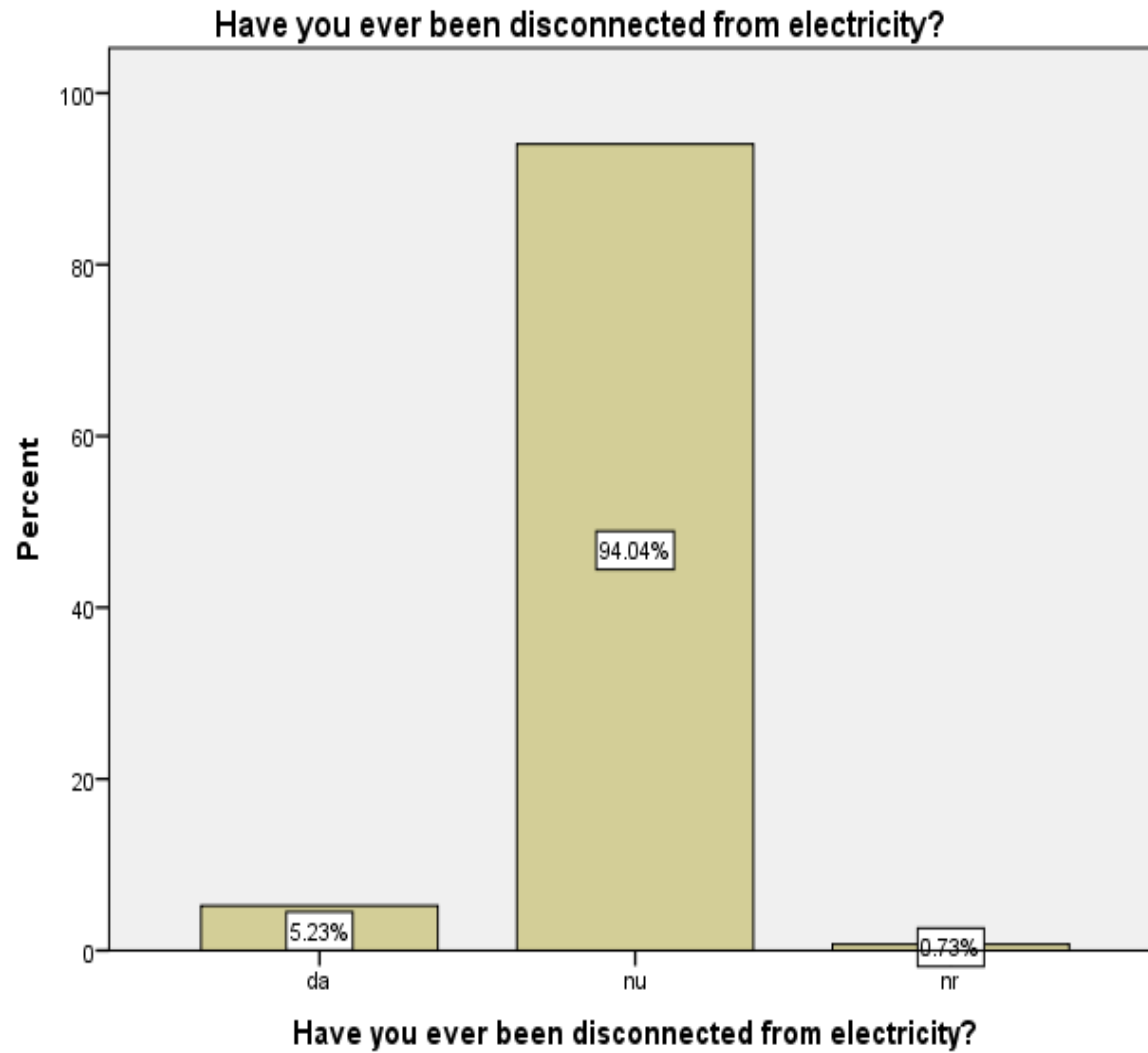


36. What time of day do you most often use energy in your home for household needs?



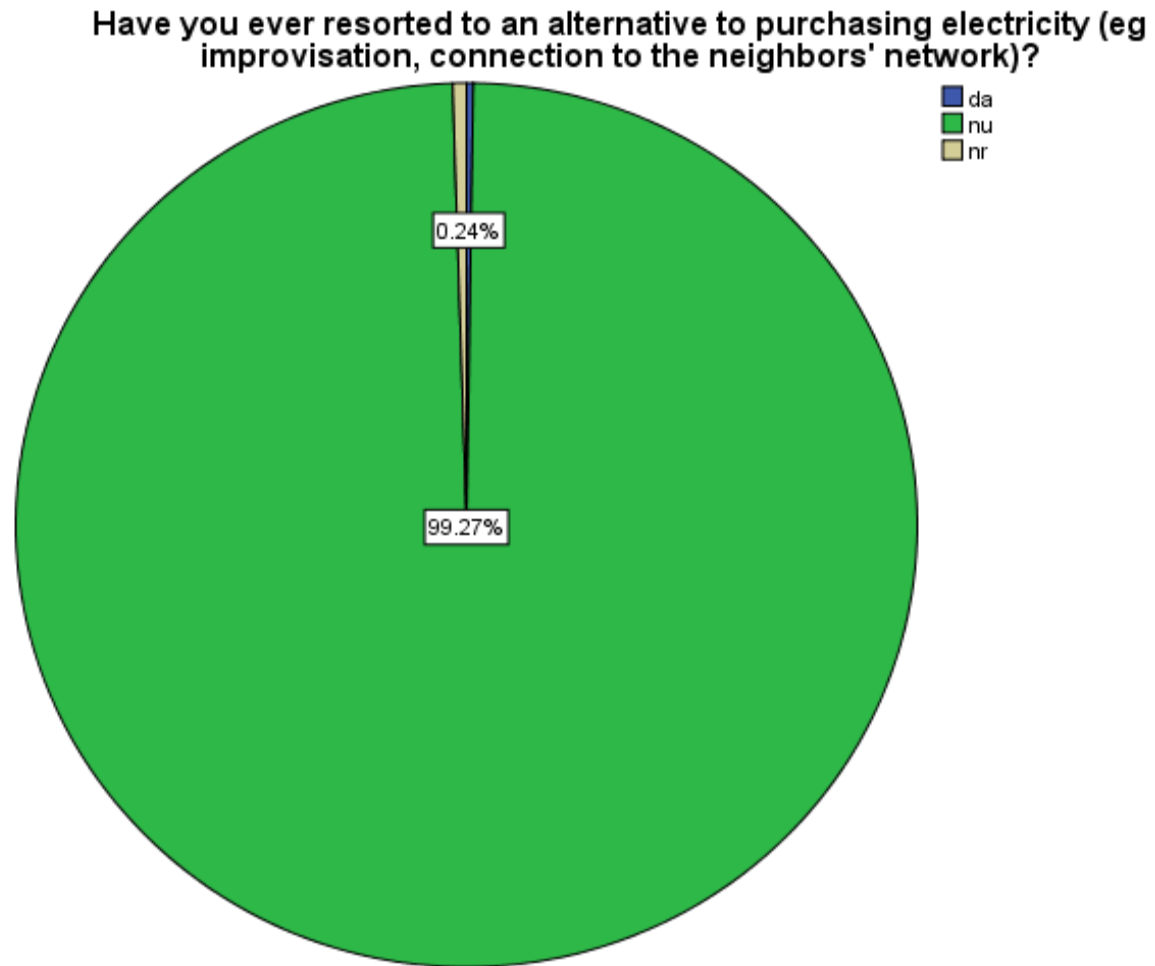


37. Have you ever been disconnected from electricity?



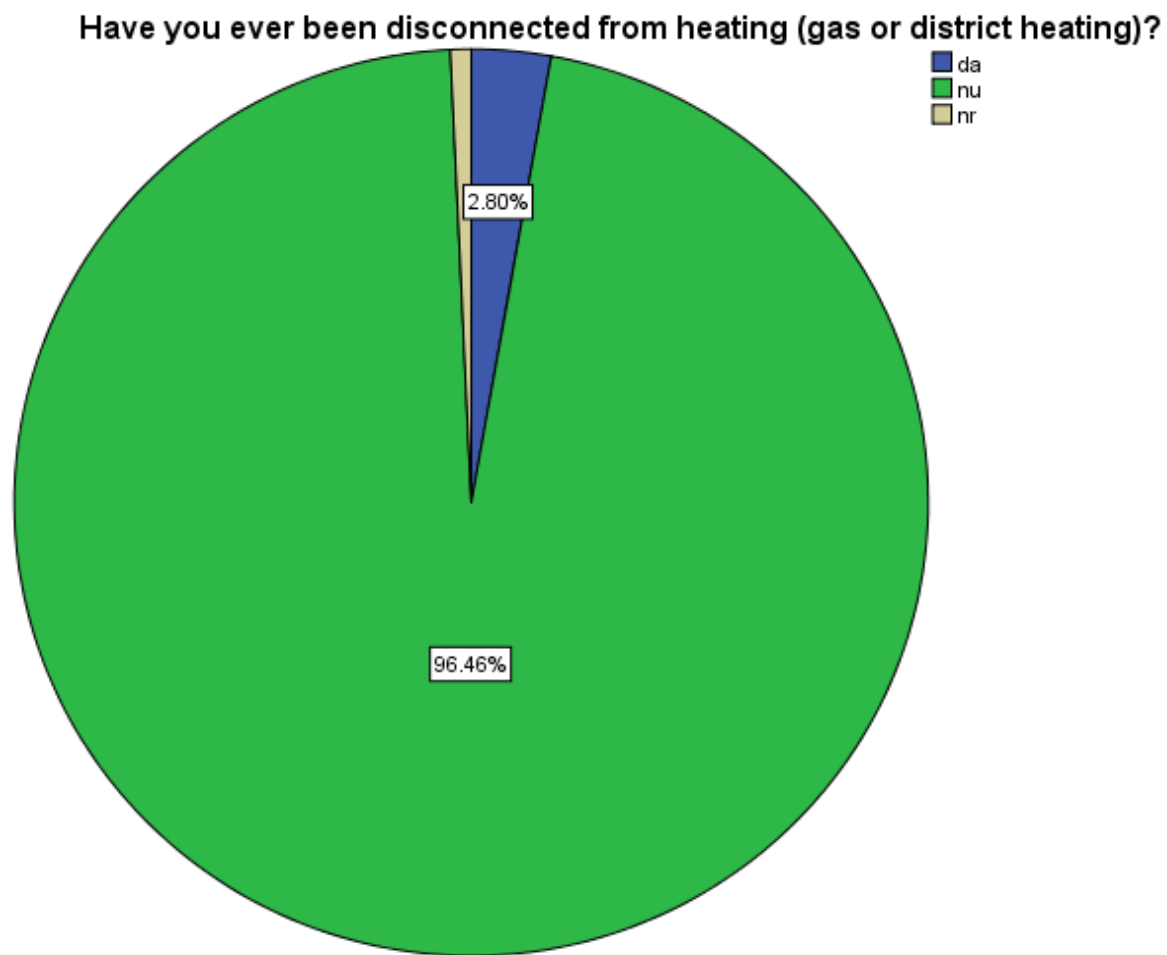


38. Have you ever resorted to an alternative to purchasing electricity (eg improvisation, connection to the neighbors' network)?



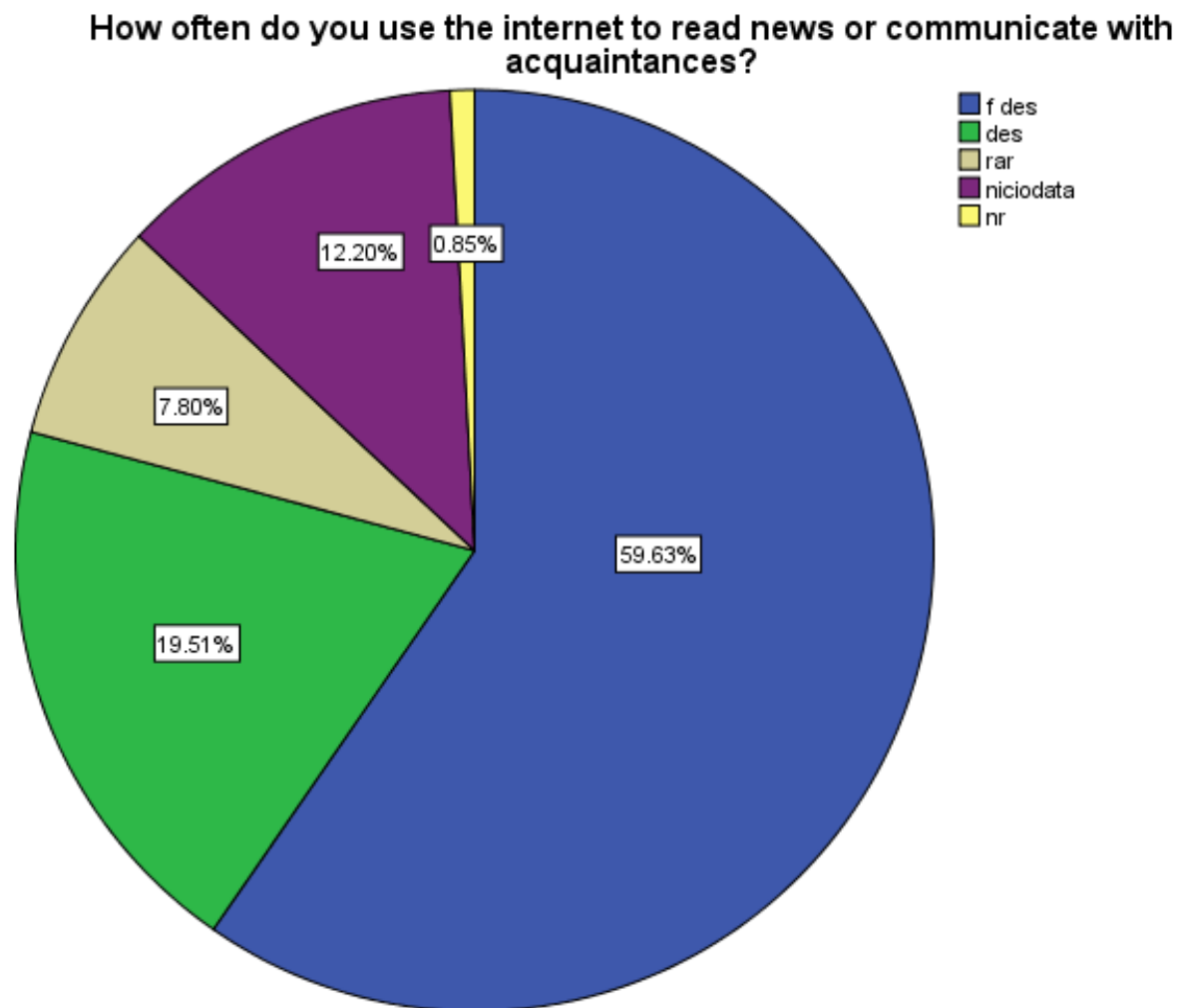


39. Have you ever been disconnected from heating (gas or district heating)?



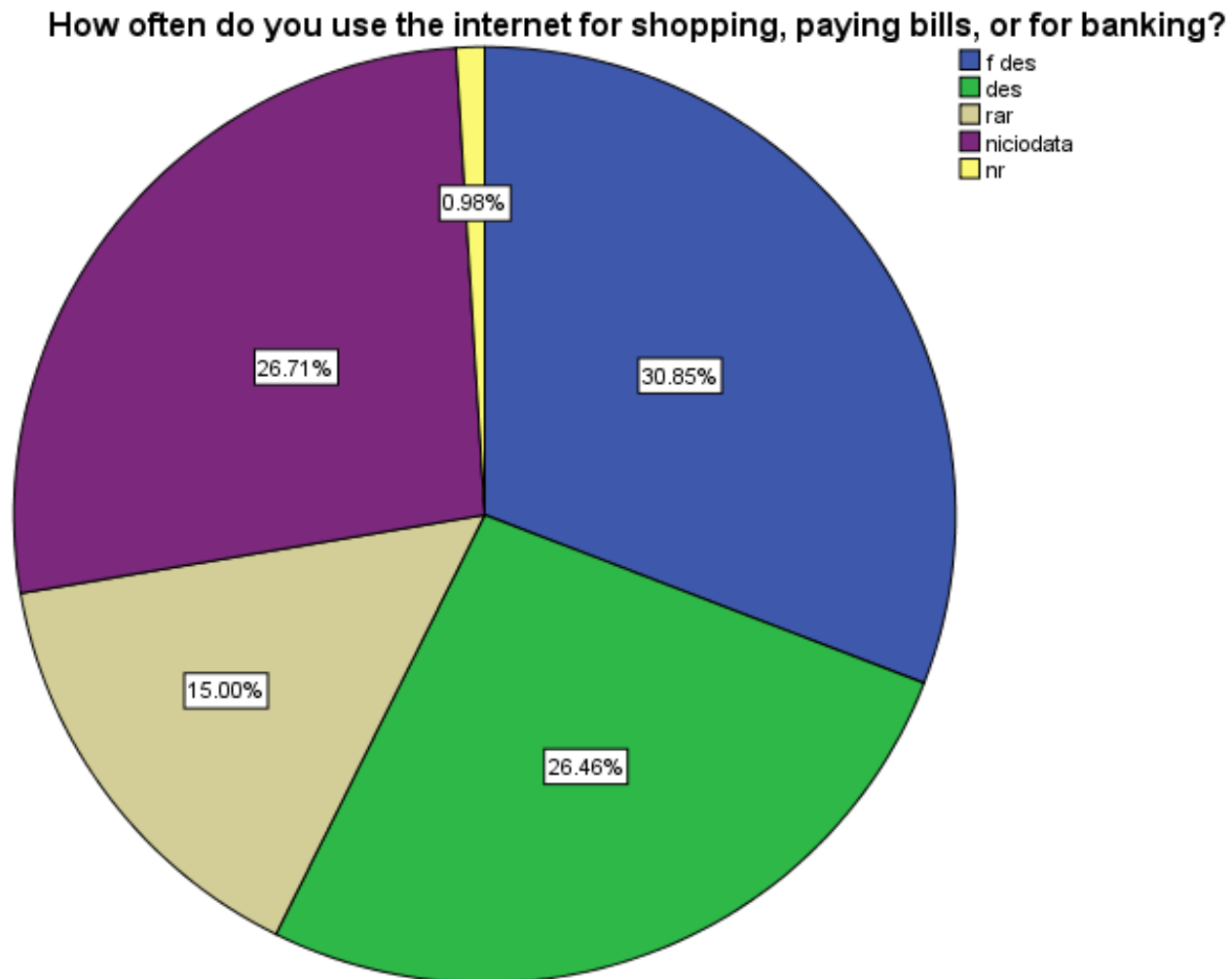


40. How often do you use the internet to read news or communicate with acquaintances?



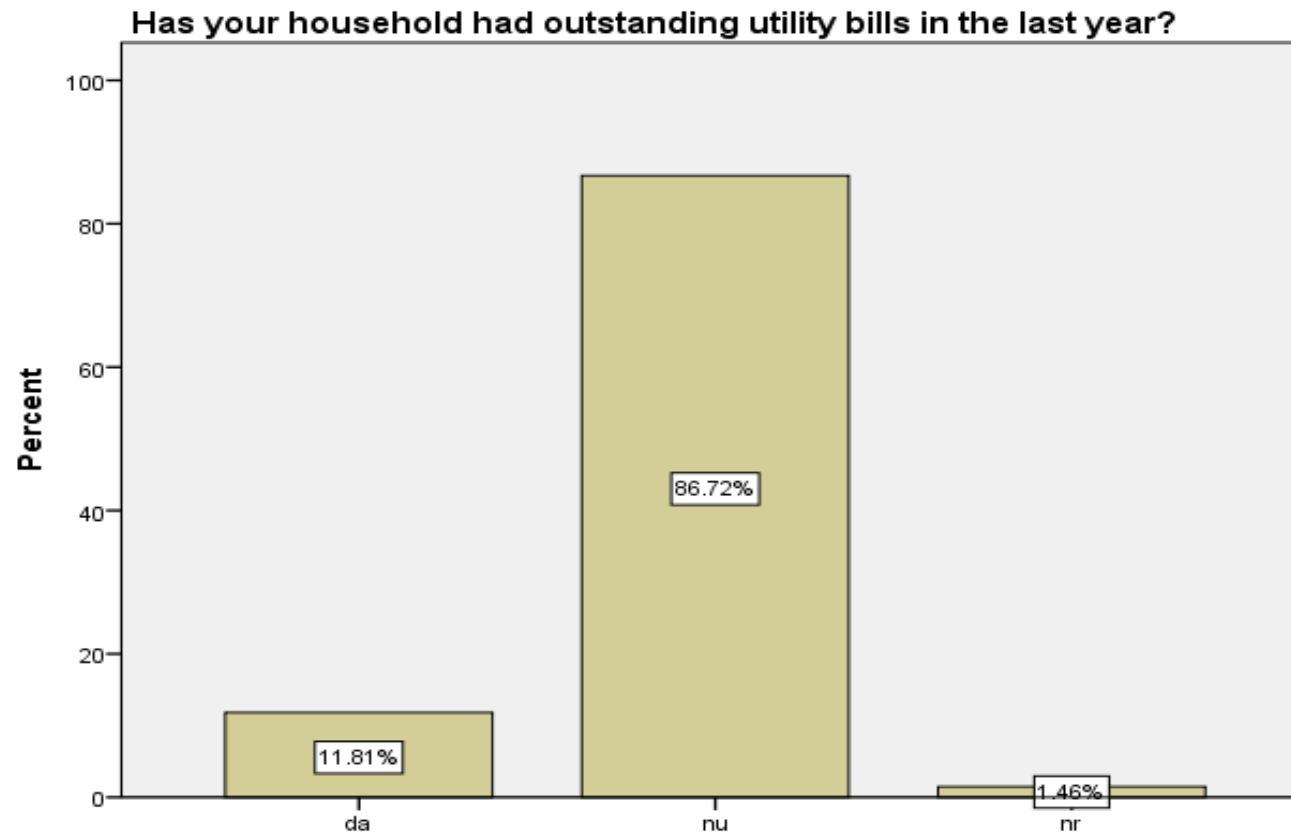


41. How often do you use the internet for shopping, paying bills, or for banking?

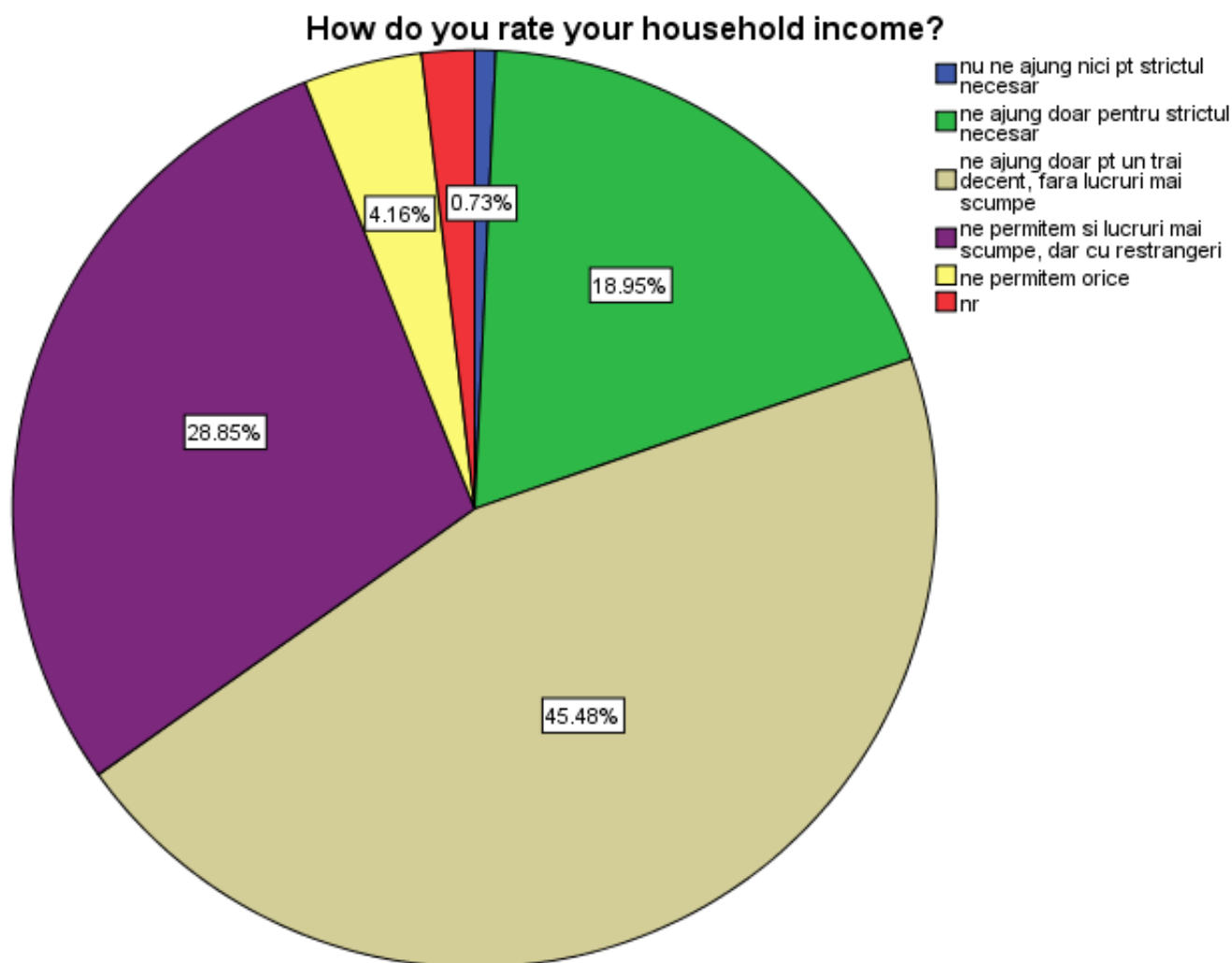




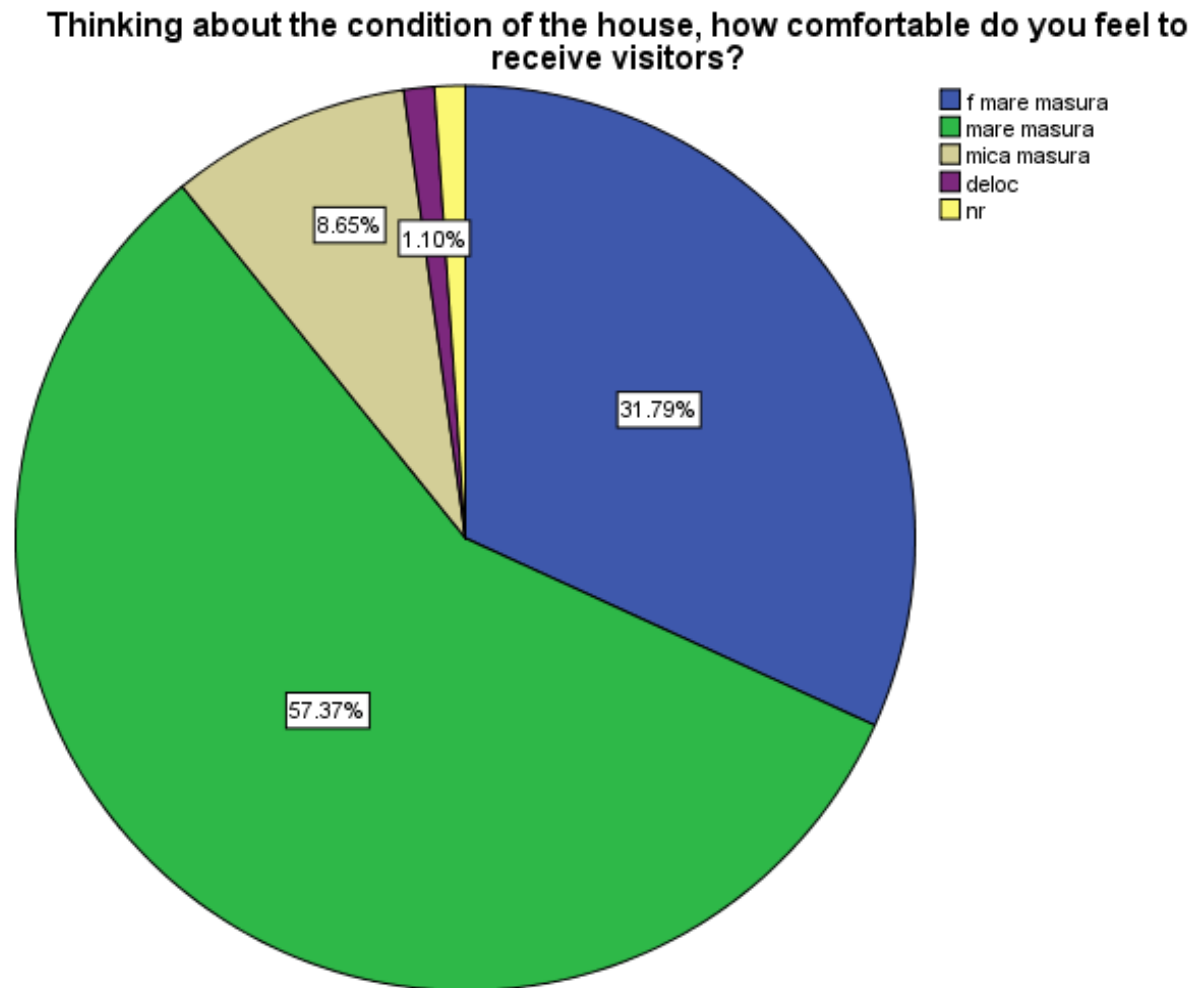
42. Has your household had outstanding utility bills in the last year?



43. How do you rate your household income?

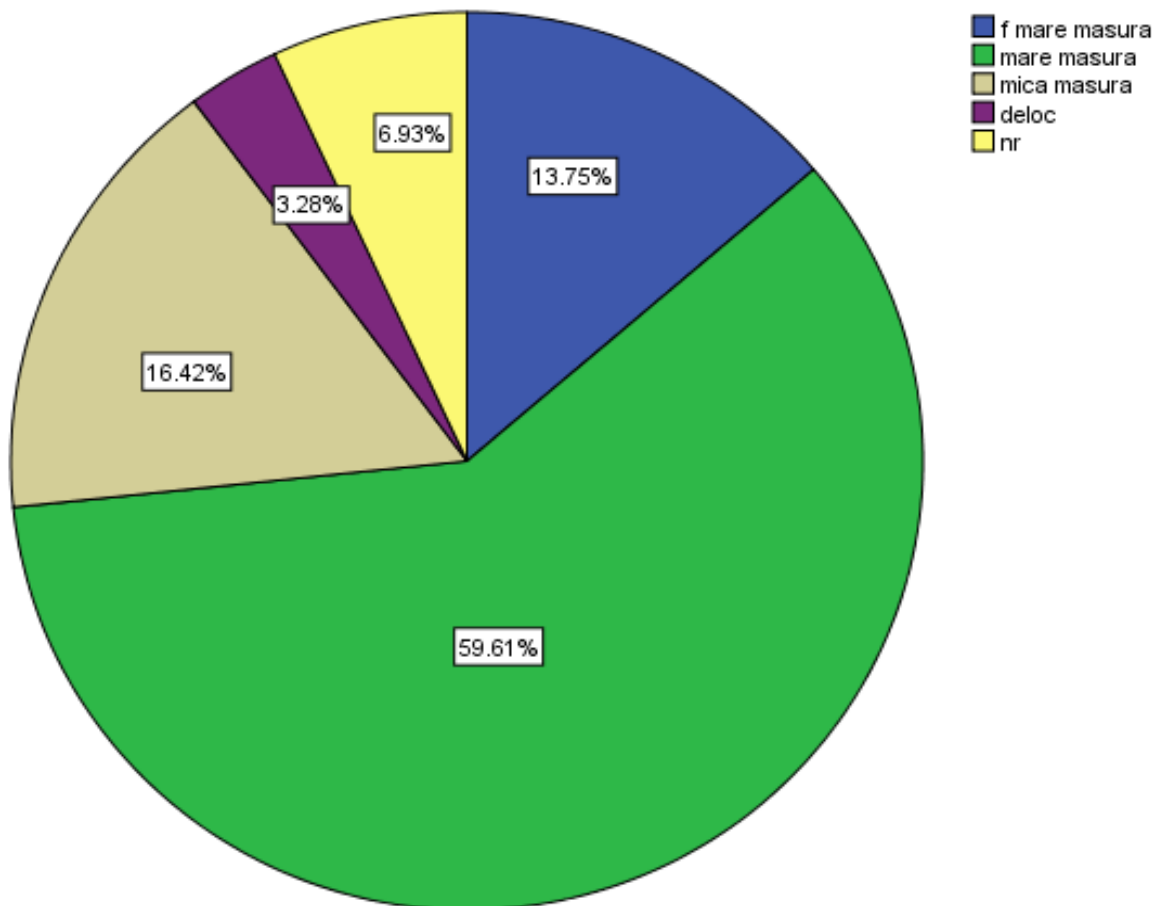


44. Thinking about the condition of the house, how comfortable do you feel to receive visitors?



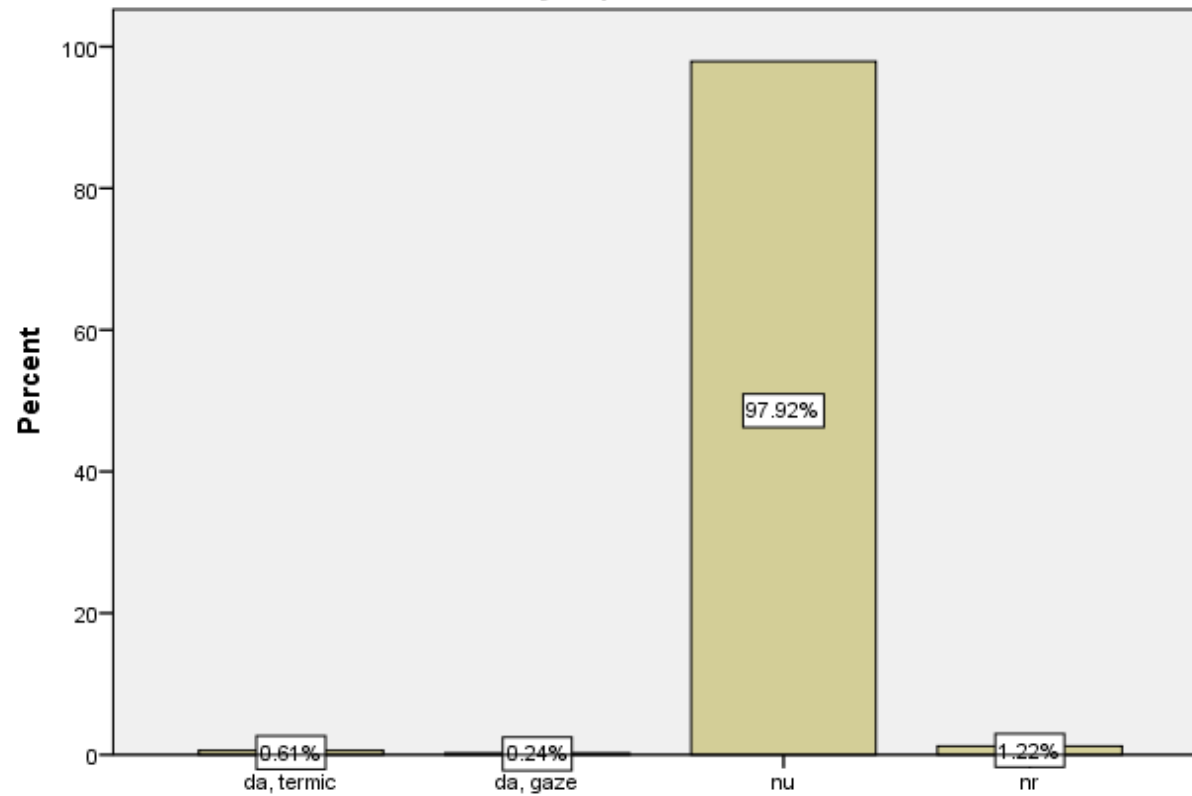
45. Considering the situations in which you have interacted with energy companies (gas, electricity, district heating), to what extent do you consider that you have been treated with respect to them?

Considering the situations in which you have interacted with energy companies (gas, electricity, district heating), to what extent do you consider that you have been treated with respect to them?



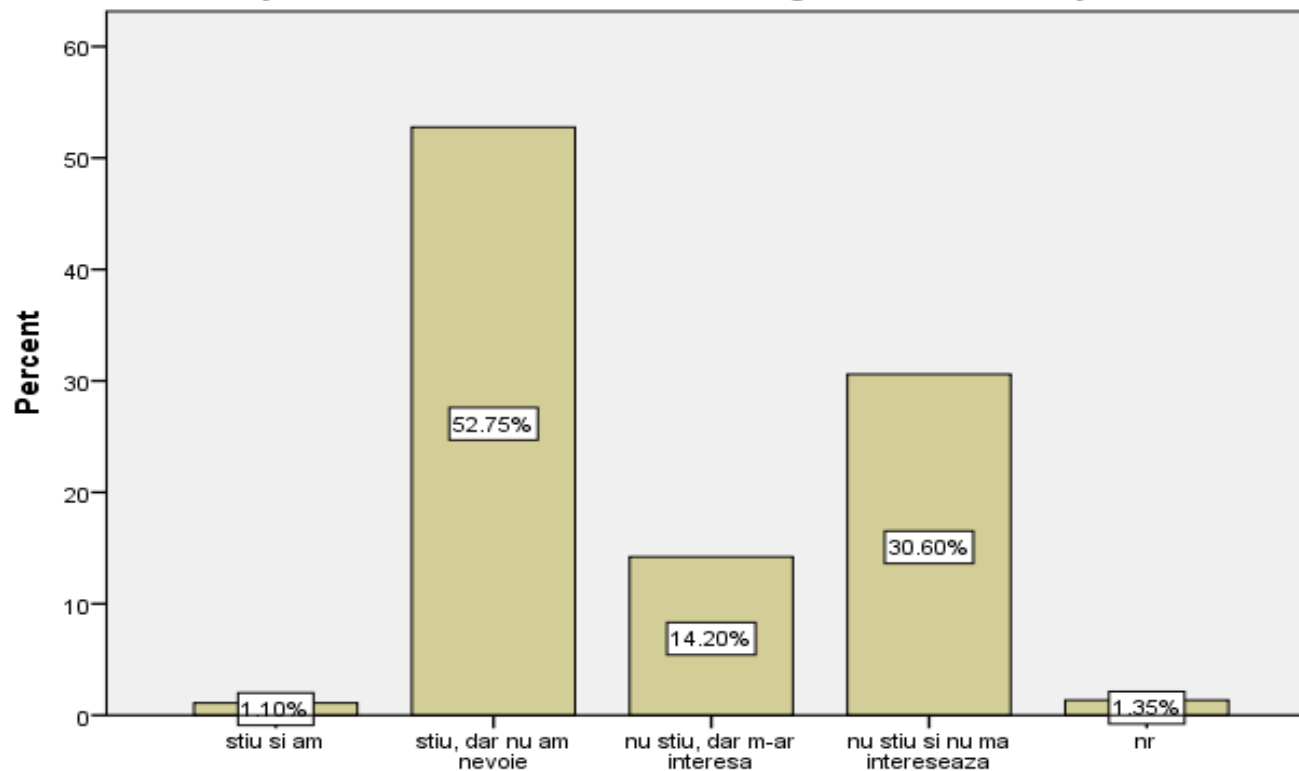
46. Has your household received subsidies (heating aid) in the last year to cover utility expenses?

Has your household received subsidies (heating aid) in the last year to cover utility expenses?



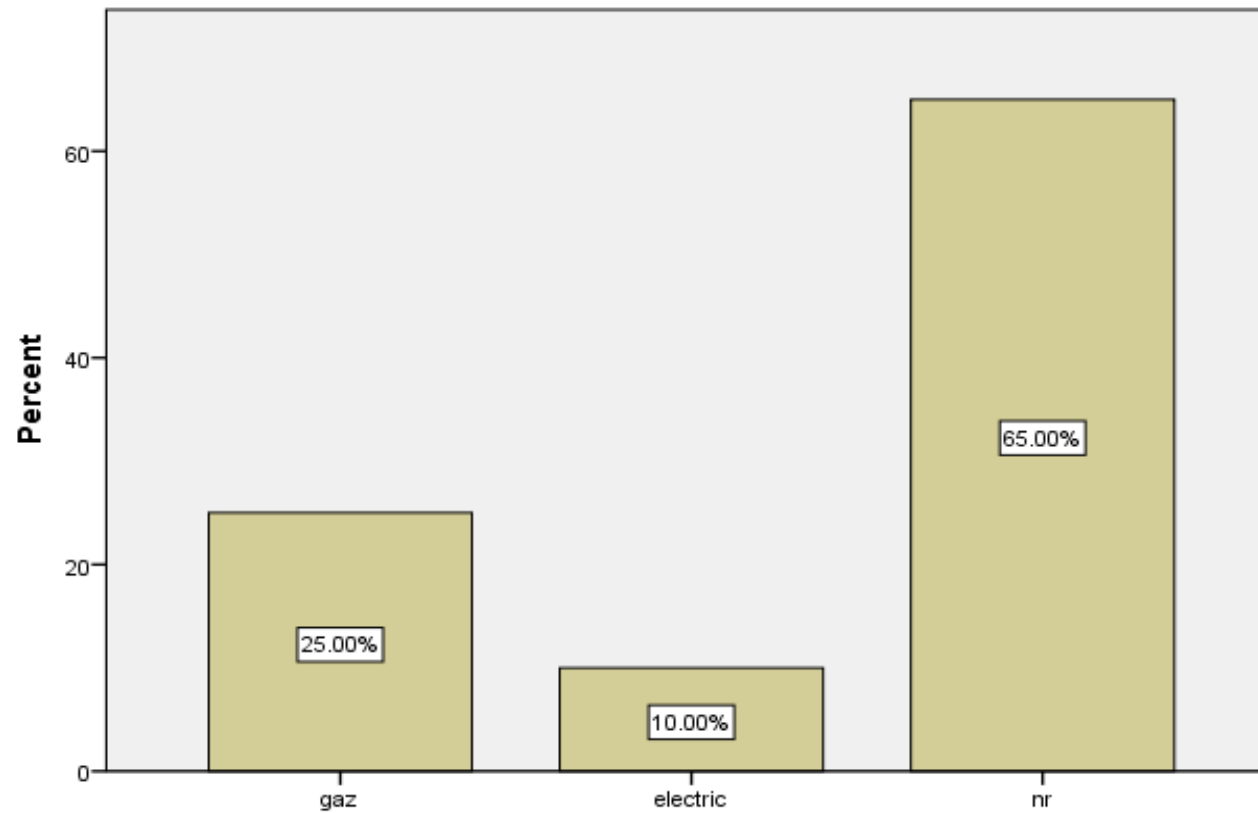
47. According to the law, subscriptions with social tariffs are available for low-income gas or electricity consumers. Which of the following statements suits you best?

According to the law, subscriptions with social tariffs are available for low-income gas or electricity consumers. Which of the following statements suits you best?

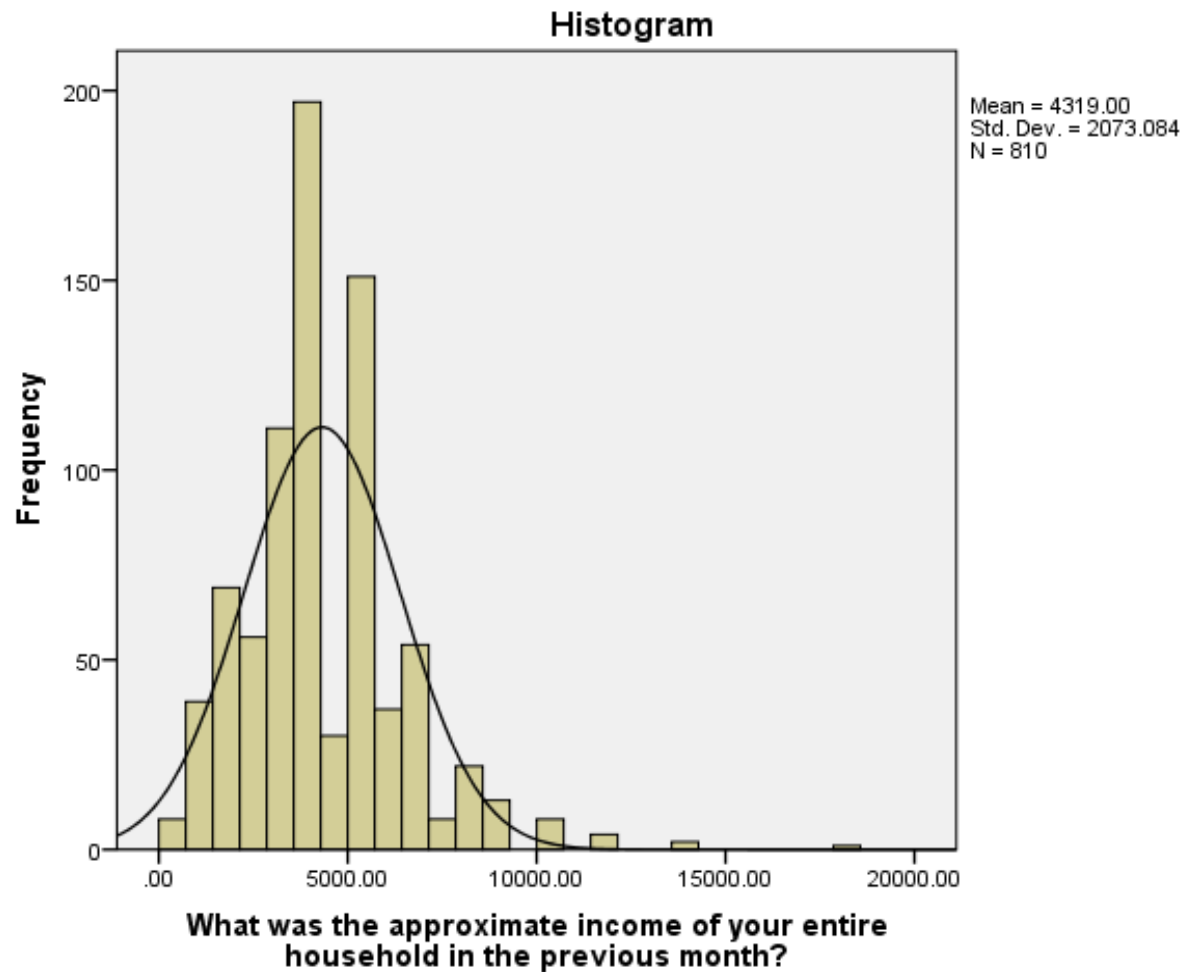


48. If he knows about the social tariff and uses it: for what type of fuel do you have a social tariff?

If he knows about the social tariff and uses it: for what type of fuel do you have a social tariff?

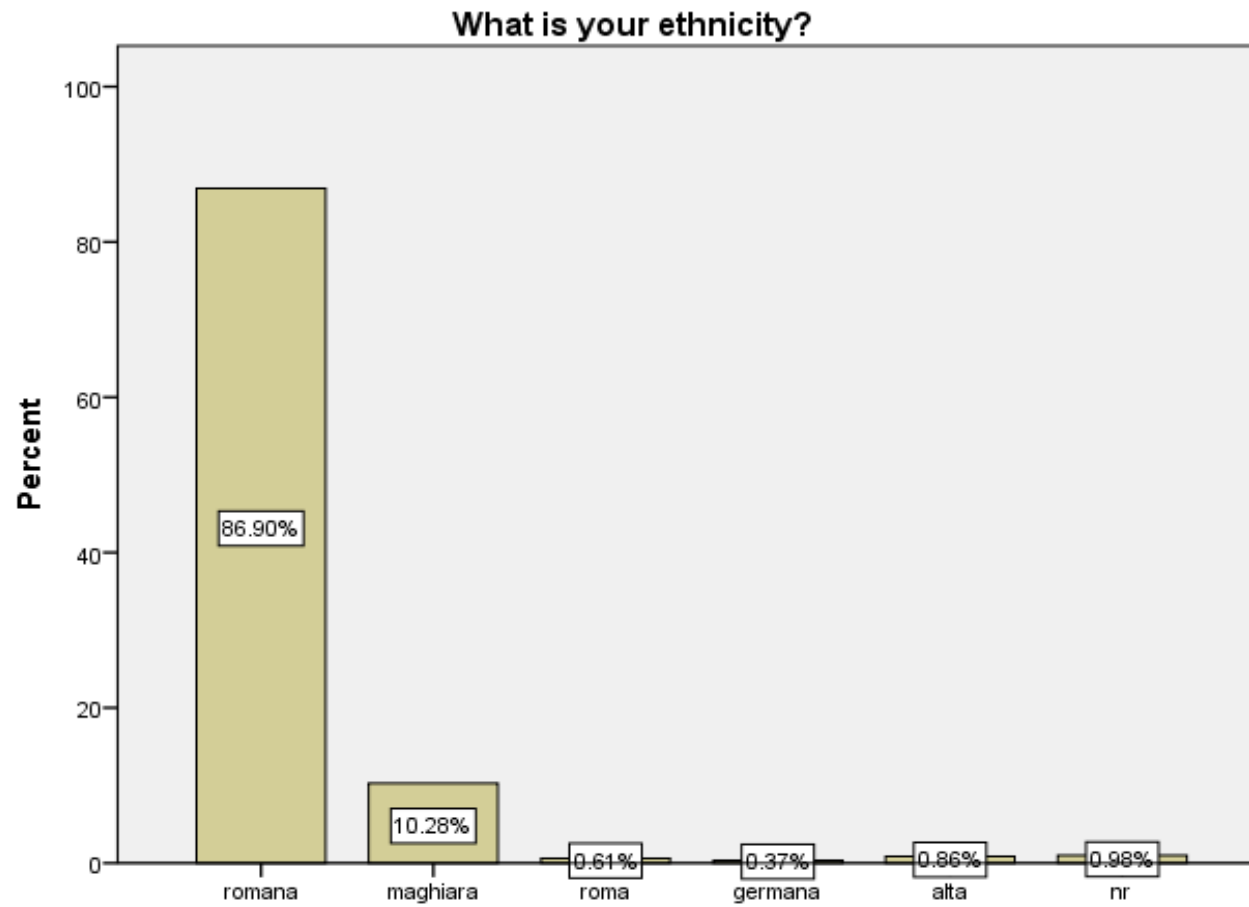


49. What was the approximate income of your entire household in the previous month?



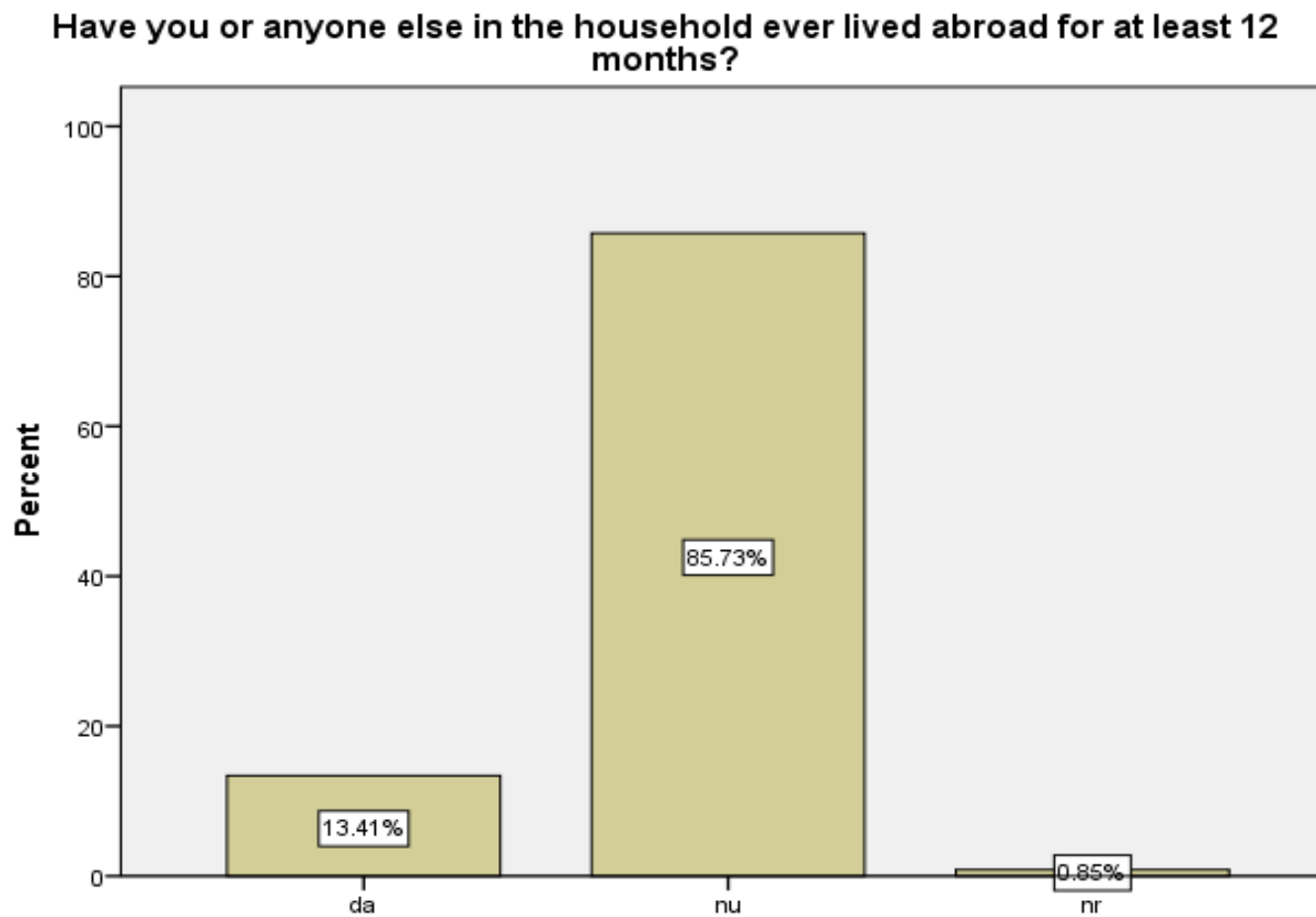


50. What is your ethnicity?



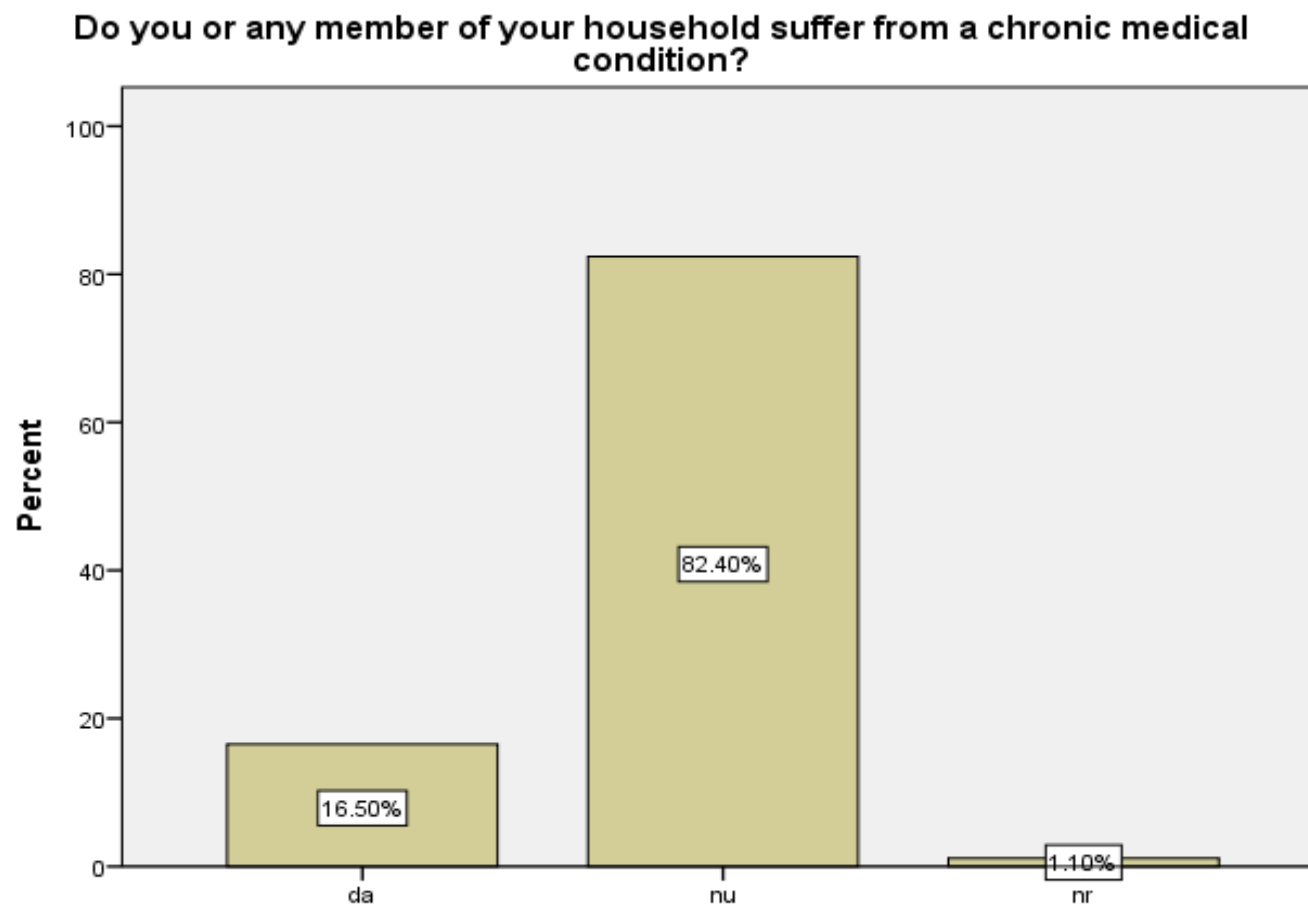


51. Have you or anyone else in the household ever lived abroad for at least 12 months?

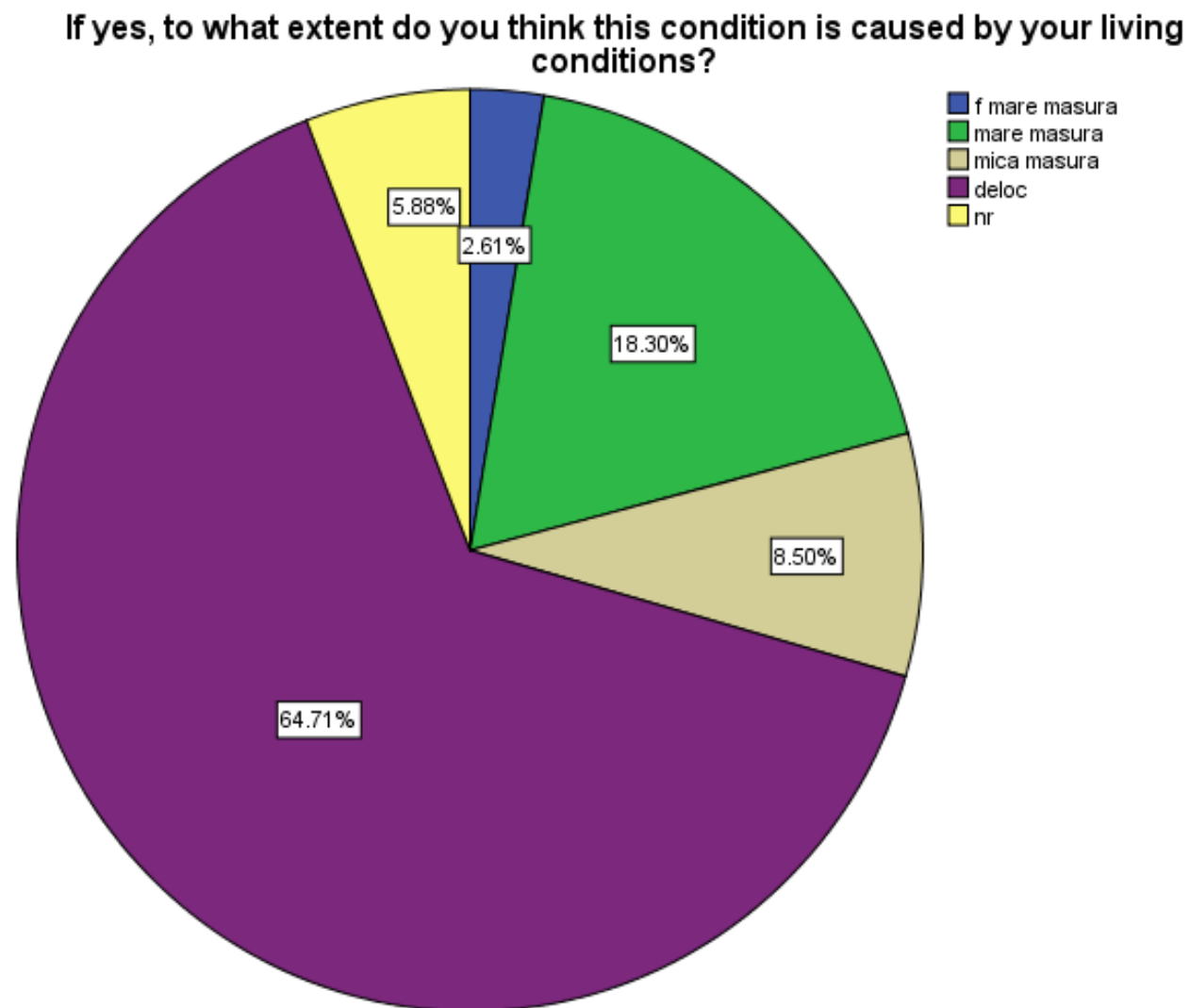




52. Do you or any member of your household suffer from a chronic medical condition?

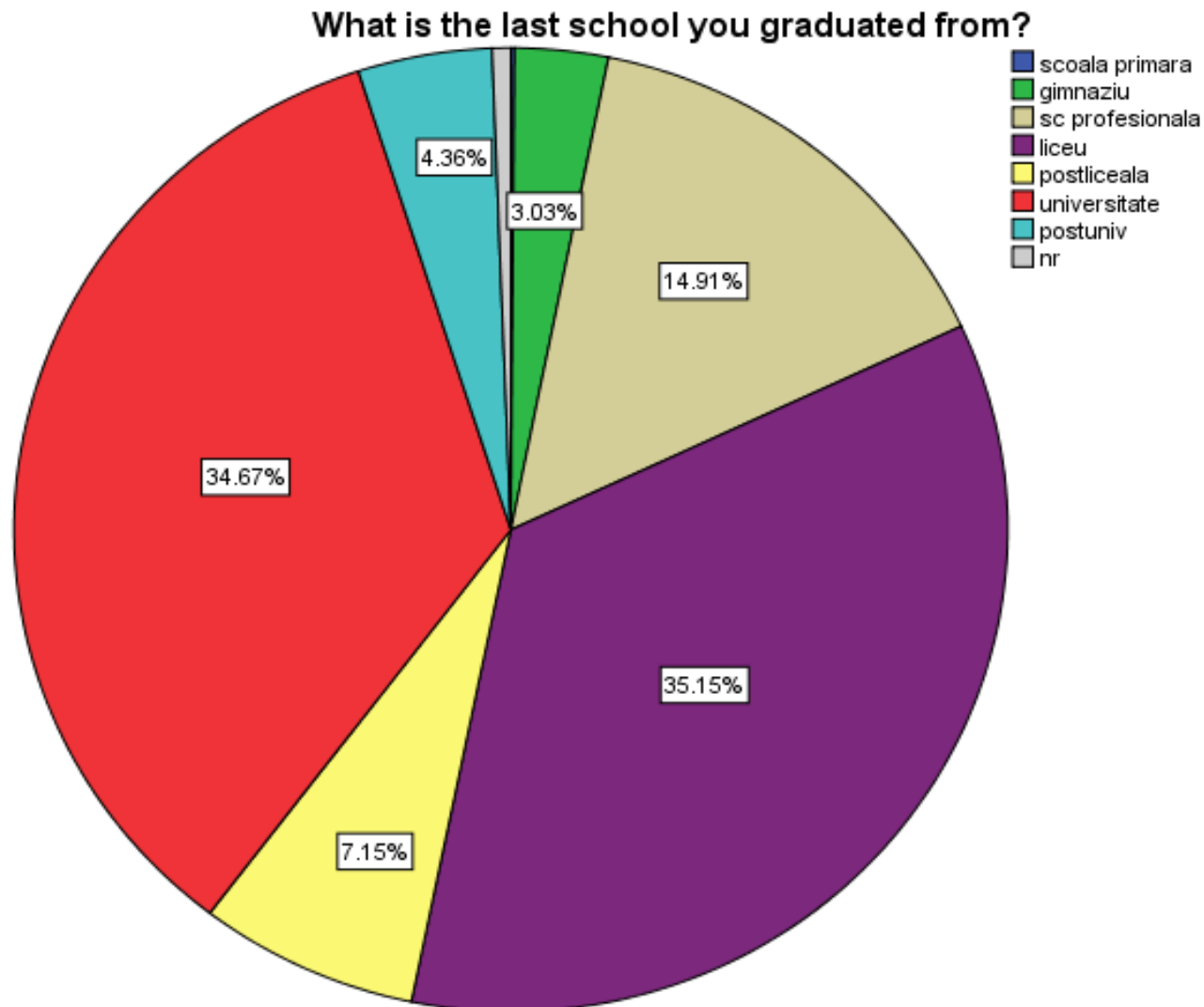


53. If yes, to what extent do you think this condition is caused by your living conditions?

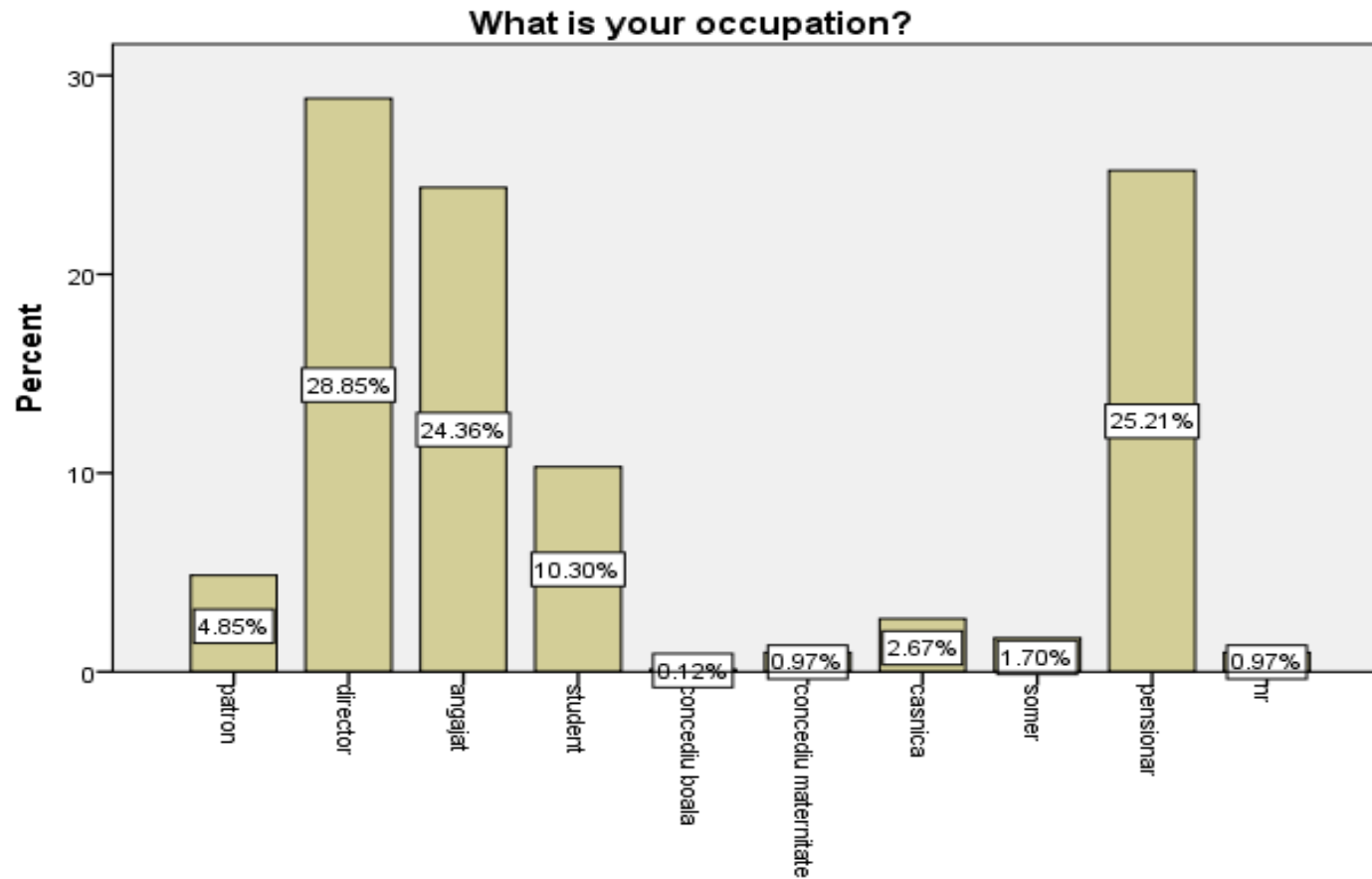




54. What is the last school you graduated from?

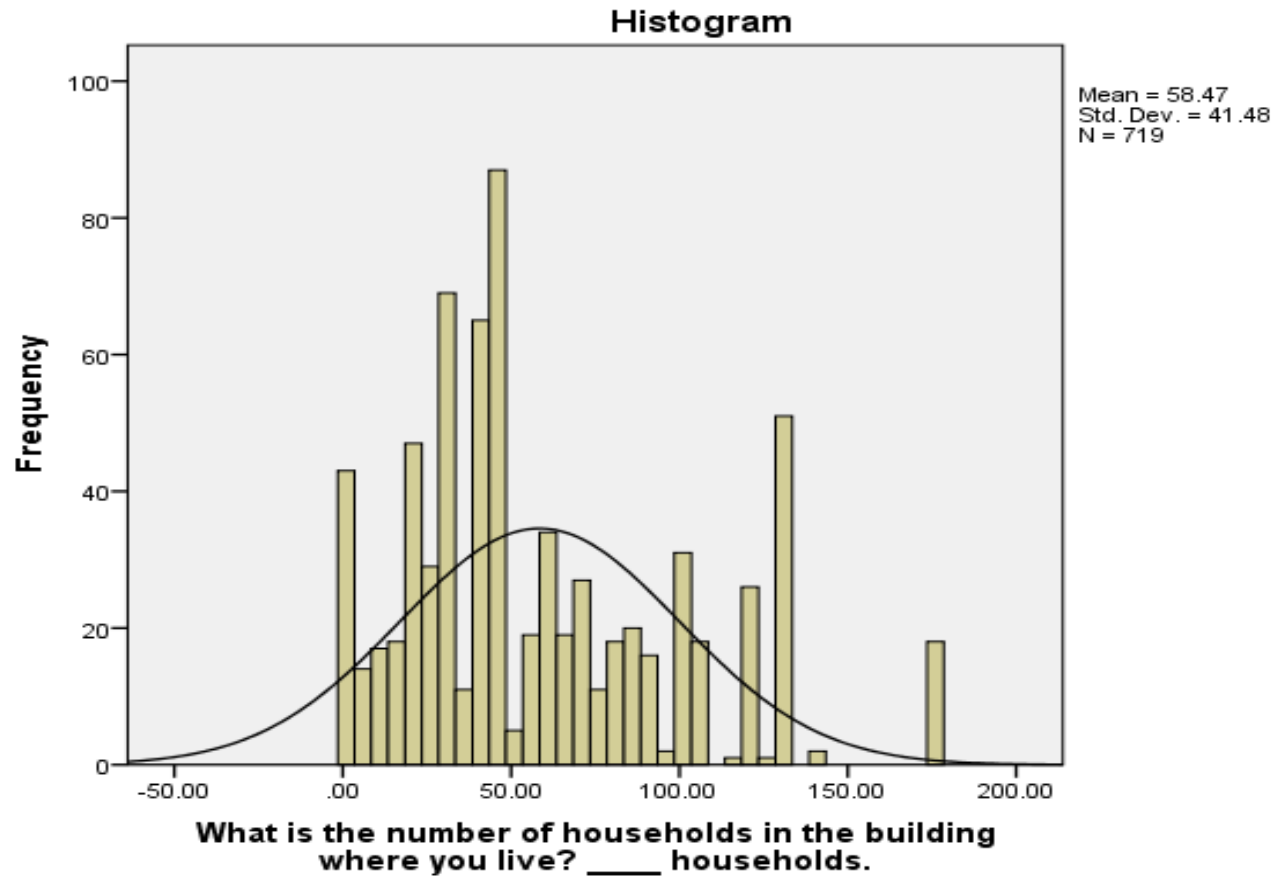


55. What is your occupation?



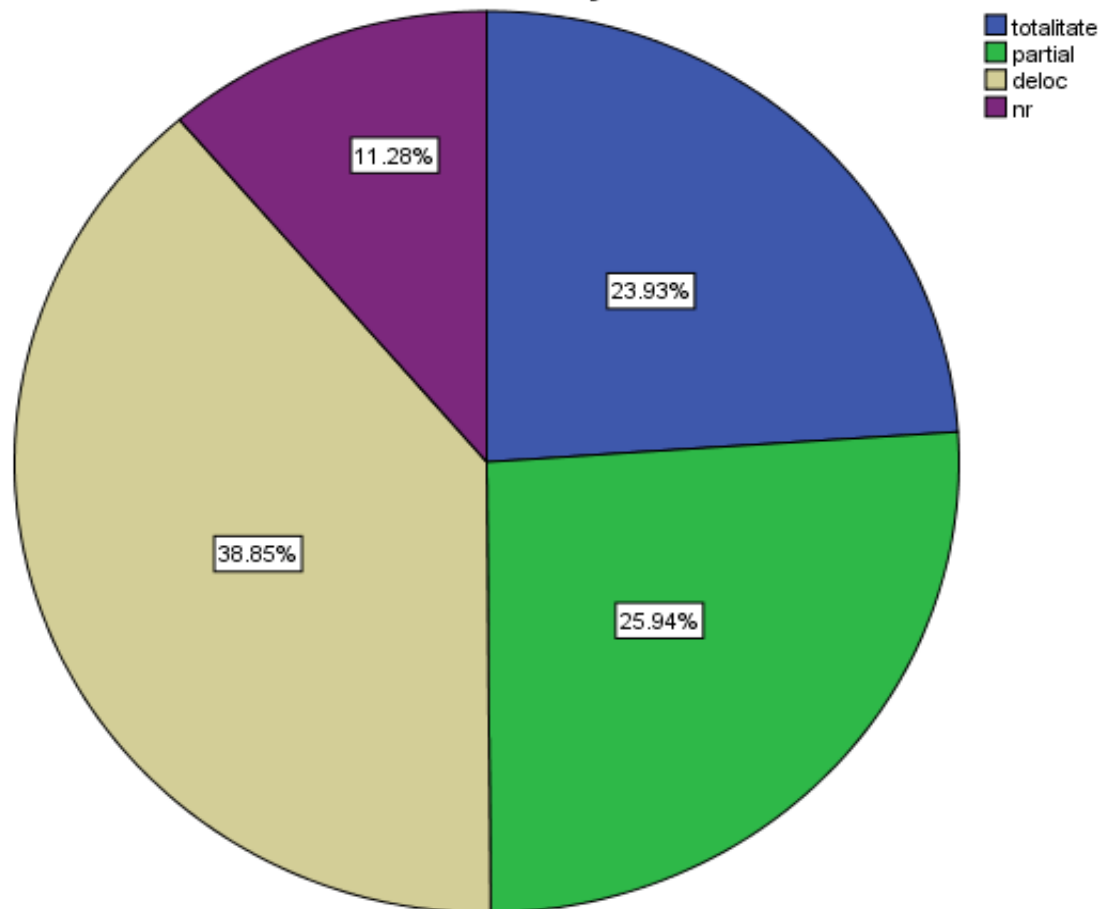


56. What is the number of households in the building where you live? ____ households.



57. If it is a collective dwelling (block, duplex): has the block in which you live been thermally rehabilitated?

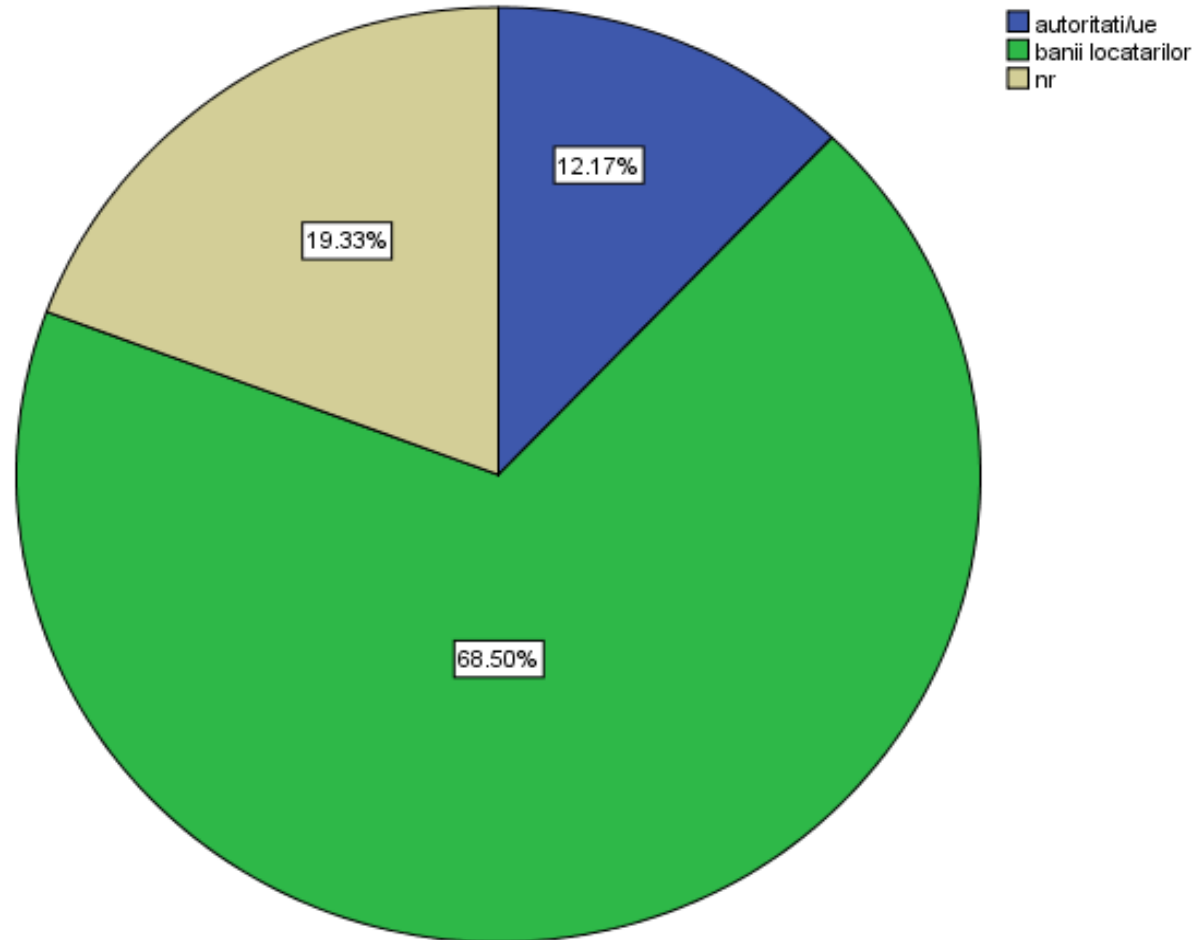
If it is a collective dwelling (block, duplex): has the block in which you live been thermally rehabilitated?



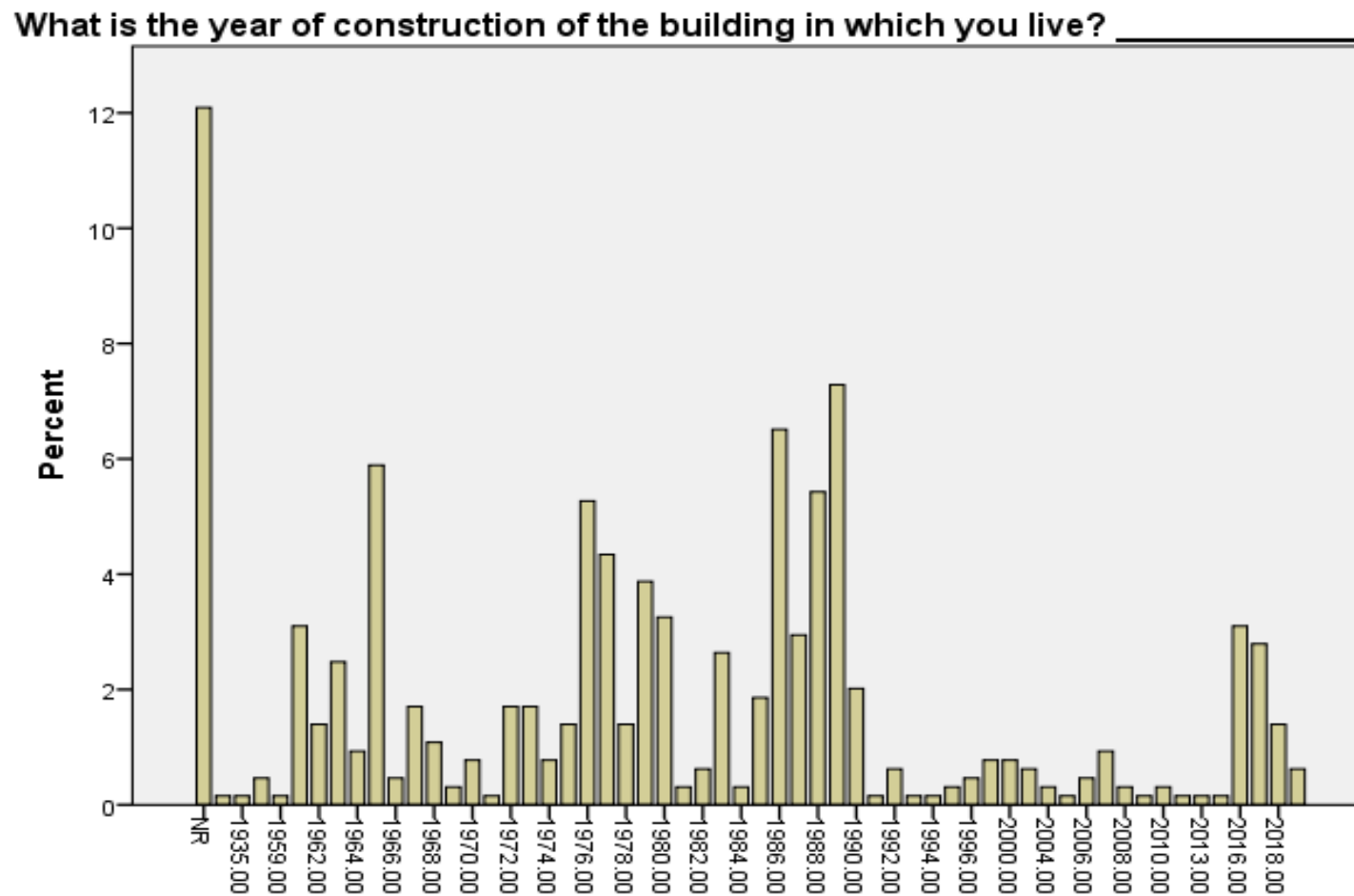


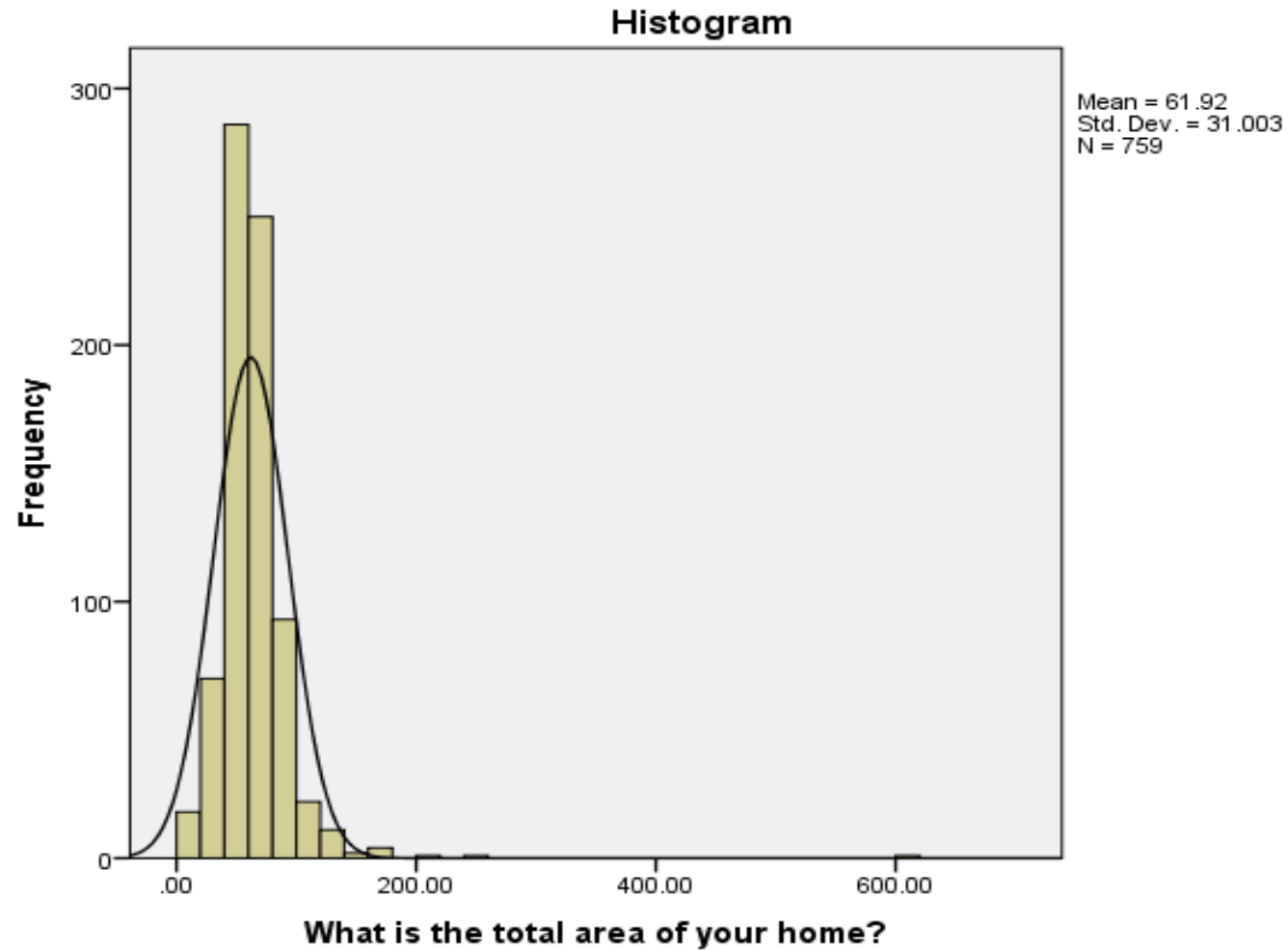
58. If it has been totally or partially rehabilitated: what were the sources of financing the works?

If it has been totally or partially rehabilitated: what were the sources of financing the works?

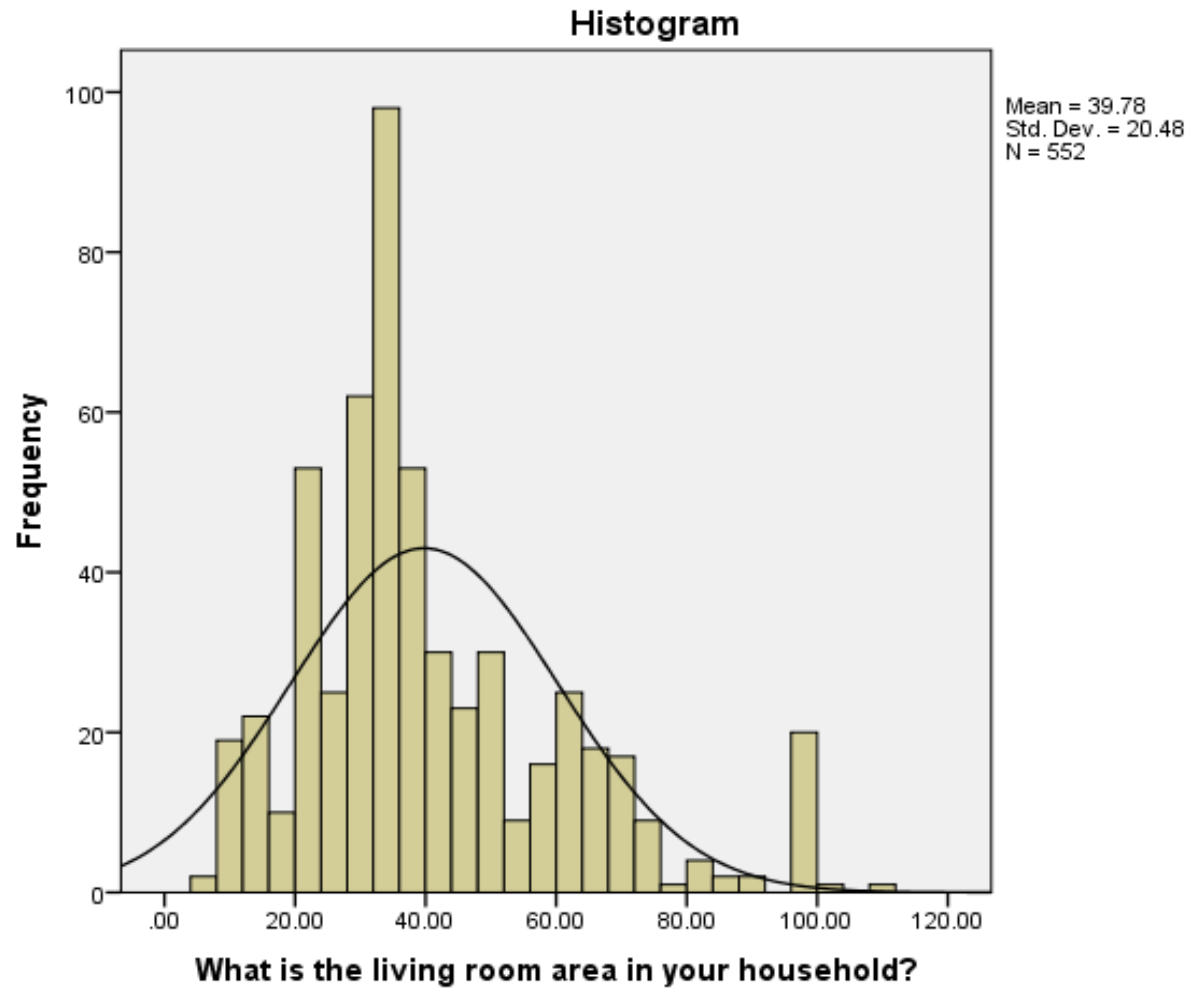


59. What is the year of construction of the building in which you live?



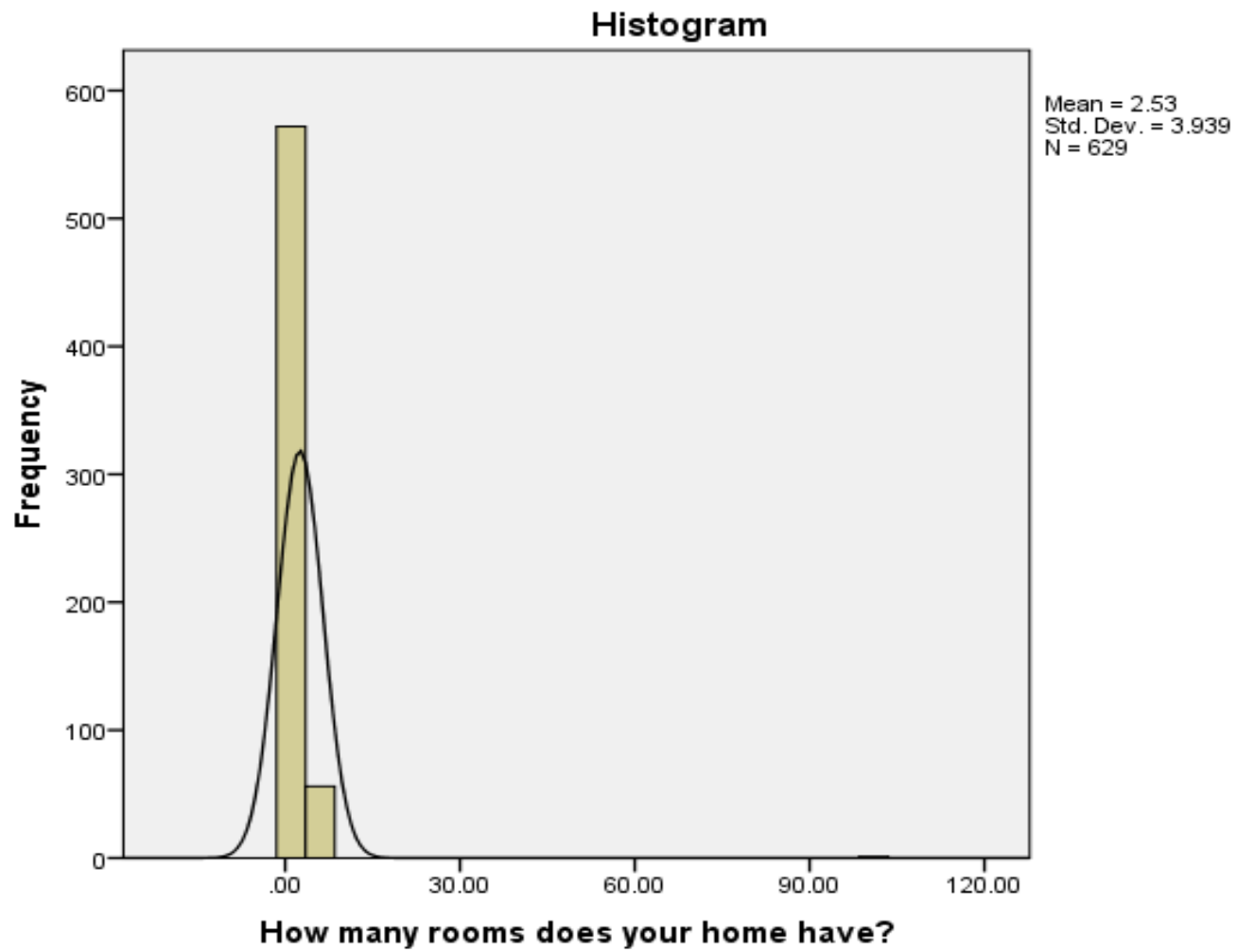


61. What is the living room area in your household?



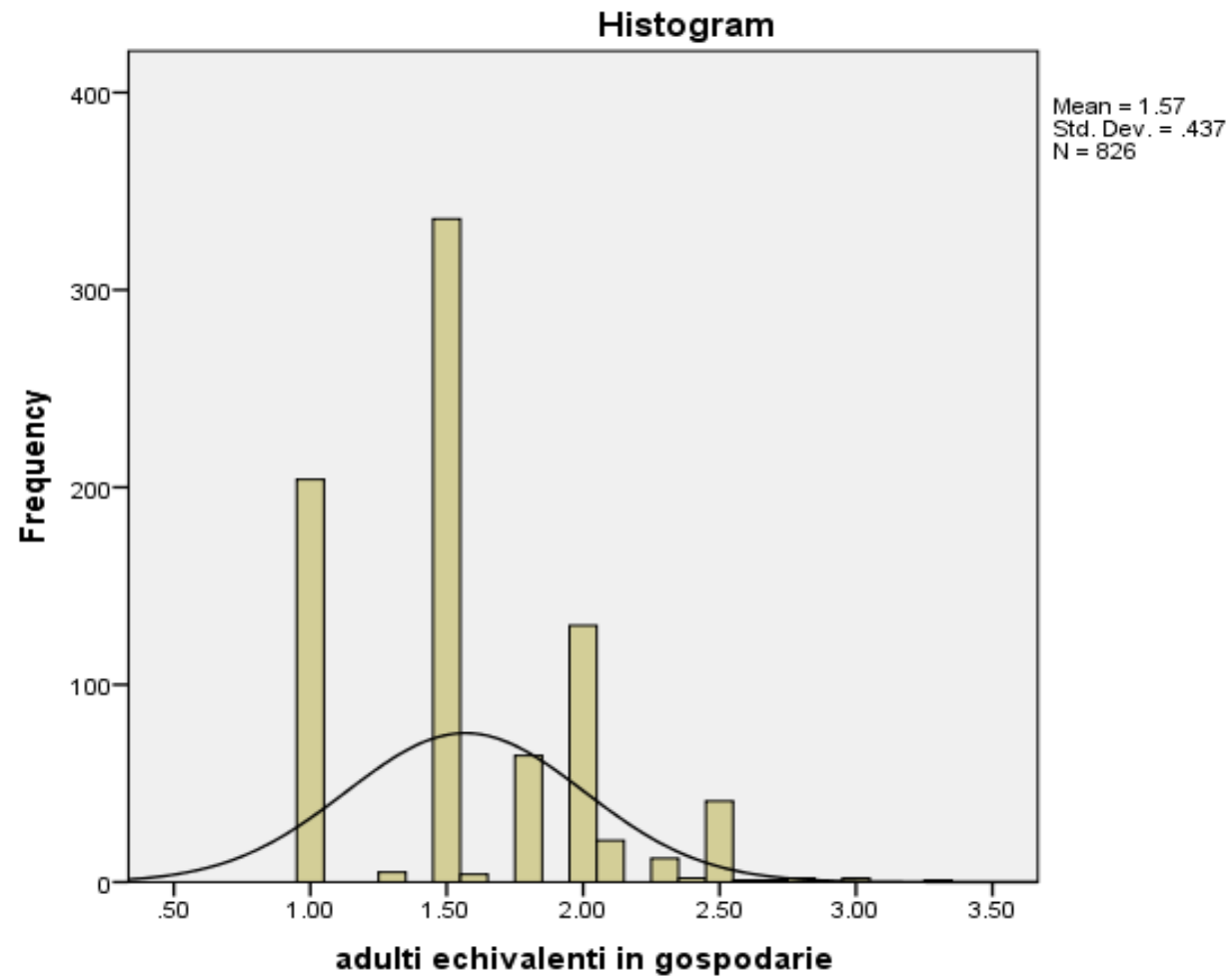


How many rooms does your home have?



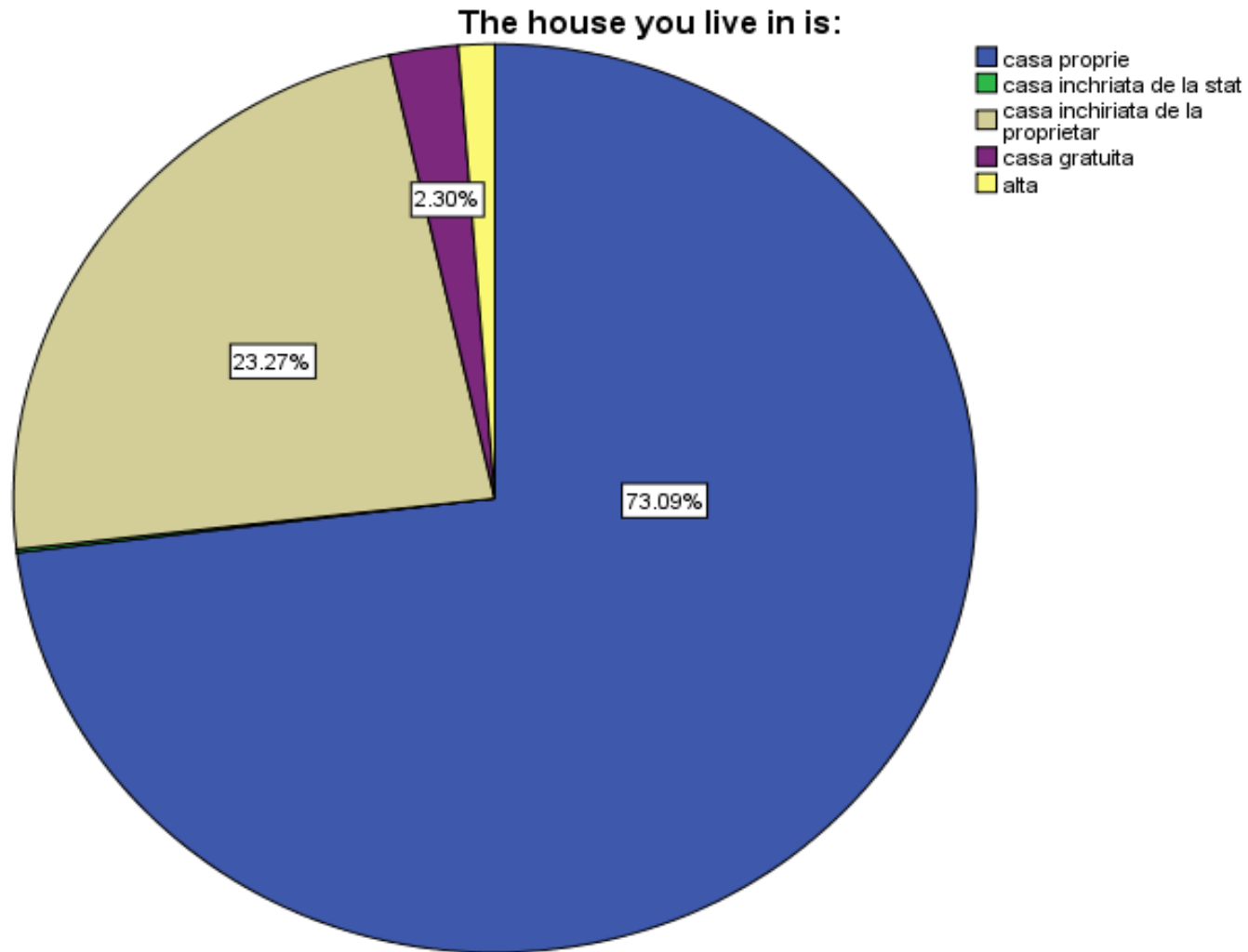


62. Equivalent adults in the household



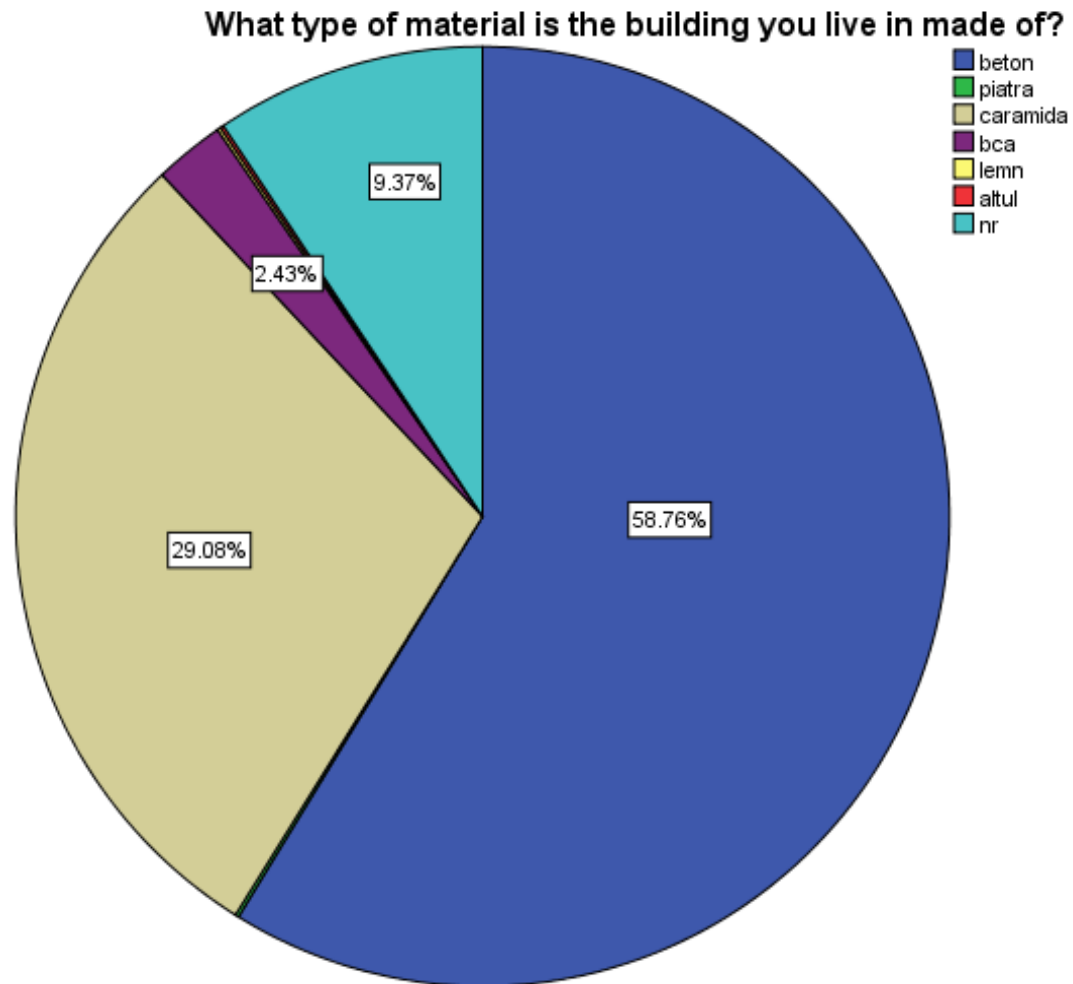


63. The house you live in is:

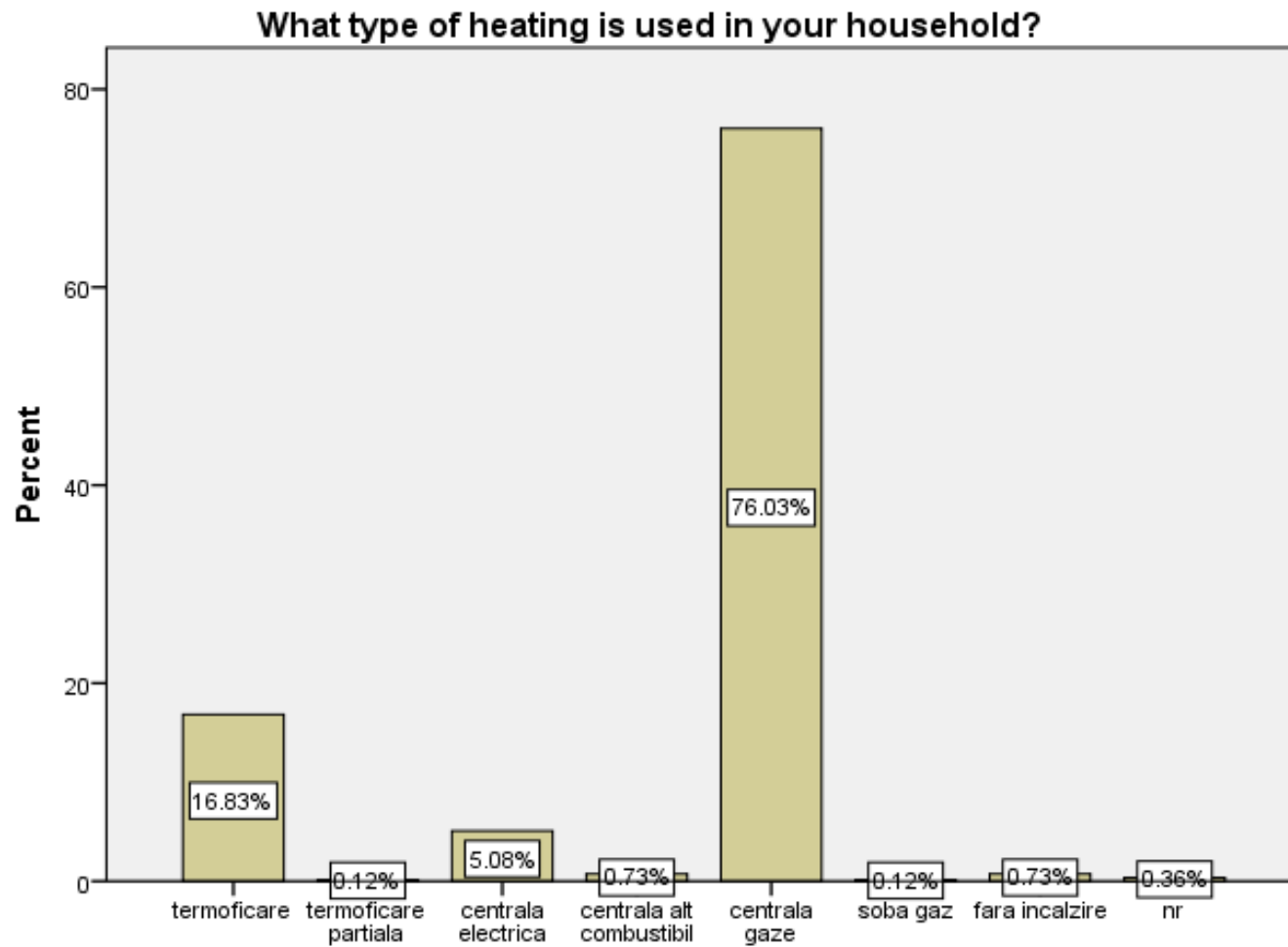




64. What type of material is the building you live in made of?



65. What type of heating is used in your household?





66. What type of fuel is used in your household for cooking?

