

Statistical Comparison of the Ratios of Households with Central Heating Between Tunceli Province and Elazığ, Erzincan and Bingöl Provinces

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Abstract – In this study, Turkey's Statistical Institute's (TUIK) 2011 data showing the number of households with central heating in Tunceli, Bingol, Erzincan and Elazığ was utilized. In a binary comparison of the values showing the ratios of households with central heating in Tunceli province by the close provinces and determining statistically the relative differences, binomial test analysis which is a non-parametric test method was utilized. The ratio of households with central heating in the Tunceli province (20.8%) showed statistically similar ratios ($p > 0.05$) with the Bingol (28%) and Erzincan (23.6%) provinces, but compared to Elazığ provinces(35,5), it is construed as having relatively lower values ($p < 0.05$). In light of this information, assuming the proportion of households with central heating as a development indicator, it is noteworthy that based on this parameter Tunceli is at a similar level with Bingöl and Erzincan provinces, but is behind the Elazığ province.

Key words – Tunceli, Housing With Central Heating, Statistics, SPSS Program

I. Introduction

Statistical analysis methods are extensively used in many areas of engineering, especially in the analysis of numerical data in food engineering [1, 2]. the statistical interpretation of numerical data and performed statistical controls are very important in order to provide reliable results [3, 4]. Continuous emigration from the Tunceli province results in a socially and economically troubled state compared to the surrounding provinces. Many parameters of Tunceli as indicators of development and environment of provinces are available in Turkish Statistical Institute (TUIK). As a development indicator, the number of houses with central heating are taken from TUIK and compared to the other provinces in order to statistically analyze the current status of Tunceli province. In this study, the number of houses with a central heating in the provinces of Tunceli, Elazığ and Bingöl were taken from the TUIK data base for 2011 and from this information, it is aimed to compare the proportional values statistically in the field of civil engineering for Tunceli and the surrounding provinces.

II. Materials and Methods

The data used in this research was taken from the TUIK data base and it shows the number of houses with central heating in the provinces of Tunceli, Elazığ, Erzincan in 2011 [5, 6, 7, 8]. Binominal test analysis which is a non-parametric test method [2, 3, 9] was used to determine

the proportional differences statistically and used for the binary comparison of the values that indicates the ratio of the houses with central heating in Tunceli and the surrounding provinces. SPSS program was used in the determination of the the statistical differences in the inter provincial proportional values.

Conclusion

In this research, the data taken from the TUIK, which shows the number of houses with central heating in Tunceli, Erzincan, Elazığ and Bingöl provinces in 2011 and it was used to determine the inter provincial proportional values of Tunceli and the values were compared statistically to the surrounding provinces. The results were represented in table 1, 2 and 3.

Table 1. Comparison proporsion of heater home between Tunceli ve Elazığ [8, 9].

Cities		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
Proporsion of heater home (%)	Tunceli	20,80	21	0,37	0,50	0,049*
	Elazığ	35,50	36	0,63		
	Total		57	1,00		

As it can be seen from the table 1, the number of houses with a central heating in Elazığ is statistically higher than Tunceli. The P value for the rational differences was found to be $P = 0.049$ and it was considered to be important. By the use of these results, the ratio of the houses with central heating was found to be 35.5% for Elazığ and 20.8% for Tunceli province. Opposing to the assumption that houses with central heating are equally distributed among the provinces, the proportional values are different in favor of Elazığ ($p < 0.05$). Table 2 shows statistically that the number of houses with central heating is 28% for Bingöl and 20.8% for Tunceli provinces and similar proportional values were obtained.

The proportional differences are around $p = 0.393$ and considered to be not important. Similar to the assumption that ratio of the houses with central heating are equally distributed among the provinces, these proportional values did not show a statistical difference for the Tunceli and Bingöl provinces ($p > 0.05$). Table 3 shows statistically that the number of houses with central heating is 23.6% for Erzincan and 20.8% for Tunceli provinces and similar proportional values were obtained.

The rational differences are around $p = 0.766$ and considered to be not important. Similar to the assumption that ratio of the houses with central heating are equally distributed among the provinces, the rational values are statistically very close for the two provinces.

Table 2. Comparison proporsion of heater home between Tunceli ve Bingöl [8, 10].

Cities		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
Proporsion of heater home (%)	Tunceli	20,80	21	0,43	0,50	0,392*
	Bingöl	28,00	28	0,57		
	Total		49	1,00		

Table 3. Comparison proporsion of heater home between Tunceli ve Erzincan [8, 11].

Cities		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
Proporsion of heater home (%)	Tunceli	20,80	21	0,47	0,50	0,766*
	Erzincan	23,60	24	0,53		
	Total		45	1,00		

If the table 1, 2 and 3 considered together, the ratio of the houses with central heating in Tunceli shows statistically similar values to Erzincan and Bingöl but compared to Elazığ, the values were found to be lower. If the ratio of the houses with central heating is considered to be as an indicator of the development, Tunceli is at a similar level with Erzincan and Bingöl but behind of Elazığ province. In this research, statistical control study was performed in order to determine whether there is a proportional differences between the number of houses with central heating in the provinces. The data should be identified in terms of, whether the numerical values which are about the level of development rate are normally distributed, whether they show discrete or continuous variable properties and whether they show heterogeneity of variance[12, 13, 14]. Statistical tests according to the parametric or non-parametric methods must be performed on the data and an urgent study on the interpretation of the numerical values determined for the level of the development must be done.

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