

## Article

# How Cities Study Quality of Life and Use This Information: Results of an Empirical Study

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**Abstract:** Quality-of-life surveys can play an important role in obtaining information for sustainable urban development. To collect such data, a proper understanding and preparation of these surveys by city offices are needed. The research team developed a research concept to investigate how city offices conduct quality-of-life surveys and use this information. The paper presents the results of a survey conducted on a sample of all cities with a population over 50,000 in Poland. The surveyed cities were divided into two groups, cities that conduct formalized quality-of-life surveys and cities that do not conduct such surveys. The survey examined how cities understand the areas that affect quality of life and how they determine the influence of the local government on the quality of life of residents. Similarities and differences were considered in the two groups of offices surveyed. The necessity of including a large number of areas that affect the quality of life in the surveys conducted by cities was emphasized. Such an approach provides an opportunity to collect a variety of data that can be used for the city's needs. It was found that cities conducting formalized quality-of-life surveys stand definitely higher in determining the impact of the local government on the quality of life of residents.

**Keywords:** information management; quality-of-life surveys; municipal office; sustainable development; smart city



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## 1. Introduction

The growth of the Earth's population, increasing urbanization, climate change and the instability of the global economic system influence the development of the smart city concept. A smart city is a multidimensional concept that can be interpreted in various ways. Many definitions of smart city have been formulated [1–6]. One of the most frequently cited definitions treats cities as smart when “investments in human and social capital and traditional (transportation) and modern (ICT—Information Communication Technology) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance” [4] (p. 70). In the analysis of the various definitions of and approaches to the smart city, six main areas can be identified: governance, people, communication, economy, environment and quality of life [6]. Implementing the concept into practice in a city should lead to a more efficient management of resources, affect human and social capital, facilitate mobility (transportation), contribute to greater prosperity (economy), ensure a higher standard of living and lead to sustainable development [7–9]. Numerous tools are available for smart city assessment. Extensive research has been conducted on the assessment tools used and their effectiveness [10–13]. The results confirmed the positive impact of the concept on urban development. The passage of time and the subsequent challenges that cities face influence the development of the concept and address selected elements of the concept. Some authors distinguish successive stages of development of the smart city concept [14–16]. At the current stage of development of the concept, special emphasis is

placed on citizen involvement and participation in urban development. Using human and social capital in the context of sustainable development is needed. Taking into account the opinions of citizens, encouraging their participation and involvement in development should offer tangible benefits [17,18]. Sustainable development is understood as a long-term and continuous process of positive changes that takes into account the principles of intergenerational equity as to the scale and scope of use of available resources [19–25]. For such a process to occur, it is necessary to acquire a variety of data and then for that data to be properly used for the city's development in the areas of transport, public safety and environment [26–30]. One of the sources to obtain information from residents is research on quality of life. To date, these surveys have mainly been used to assess residents' satisfaction, evaluate the city government's performance and determine indicators [31–34]. A review of the recent publications on quality-of-life surveys did not confirm that the information obtained was used to make decisions and actions aimed at sustainable urban development [33–41]. Thus, a cognitive gap can be seen regarding the use of information obtained from residents in the context of sustainable development. The research team developed a research concept to determine how cities conduct quality-of-life surveys to gather information that is useful for multifaceted and sustainable development [42]. This type of research represents a new approach to analyzing the information obtained from residents and the possibility of using it in previously unused manners. We tried to use a comprehensive approach to understand quality-of-life issues, conduct research in this area and use the information obtained from it. Two stages of empirical research were planned and conducted. The first stage focused on cities that conduct formalized quality-of-life research. As a result of the research, the first stage determined the understanding of areas affecting quality of life, the inclusion of these areas in the surveys and the potential expansion of these areas in subsequent surveys [43]. We considered how cities process and use information in the context of sustainable development [44]. The second stage, whose results are presented in this paper, focused on two groups of cities: the first, which conducts formalized quality-of-life research, and the second, which does not conduct such surveys. Formalized quality-of-life research should be understood as cyclical, structured surveys among residents conducted by cities for a well-defined purpose and usually implemented using a survey form. The division into such research groups accounts for the originality of the research approach. To date, the literature has focused on cities that conduct formalized quality-of-life surveys. We focused, for the first time, on comparing cities that conduct formalized quality-of-life surveys with cities that do not. Surveys were conducted on a sample of city offices in all cities in Poland with a population of more than 50,000.

The purpose of the research is to examine how two groups of cities, those conducting and those not conducting formalized quality-of-life surveys, understand the areas that affect quality of life and how they determine the impact of the local government on the residents' quality of life.

The paper is structured as follows: literature review, materials and method, results, discussion and conclusions. In the literature review, there is an analysis of the background of the paper based on scientific papers from international journals. In the next section, the research object is characterized and the research methodology is described. The next section presents the results of the study, including their statistical compilation. The Discussion Section analyzes the results obtained and refers to other research results. The last section—the conclusions—recapitulates all of the results of the paper and provides information on their importance and limitations.

## 2. Literature Review

Quality of life is a complex and multifaceted concept that is difficult to define clearly. In the literature, one can find many attempts to interpret and define the concept [45–52]. Given the complexity of the concept, the division between objective and subjective quality of life is particularly important [53–56]. Objective quality of life is similar in meaning to the terms living conditions and standard of living, and denotes the totality of objective conditions of

the infrastructural nature in which a society lives. This aspect of quality of life is equated with the well-being of society. Objective quality of life, which is the subject of empirical research, includes the analysis of the living conditions of individuals and collectivities in relation to the basic dimensions, related to both the material condition and the existential and environmental security of the lives of individuals. The following categories are most often considered: material living conditions, health, education, economic activity, social ties and relations, state functioning and infrastructure and environmental quality [57,58]. To determine objective quality of life, public statistics are usually used, using various types of indicators [54–56]. Subjective quality of life, on the other hand, is related to an assessment of the degree to which an individual's needs are met. It is a subjective perception of one's own life within a certain value system and certain social, economic and political conditions [57–59]. This perception of quality of life requires access to citizens' opinions. Thus, there are two ways of describing quality of life, which should be complementary to each other [60]. The modern understanding of the concept of quality of life requires a holistic view and consideration of two basic components. It is necessary to skillfully link objective indicators derived from public statistics with subjective indicators obtained through surveys [57,58].

Cities, as units of local government, should be interested in obtaining as much information as possible regarding both objective and subjective quality of life assessments [1,5,27,33–40,61]. This information, when properly processed and analyzed, can be used to take action in the various spheres of city activity. Data for objective assessment of quality of life are provided by public statistics, using various types of indicators. Within the European Union, there are several options for obtaining this type of data.

A major undertaking is the study of the quality of life in European cities within the framework of the Urban Statistics program (former name Urban Audit). Surveys of quality of life in European cities under the Urban Statistics (Urban Audit) program have been conducted periodically since 1998 [62]. The surveys are a joint initiative of the European Commission, the Directorate General for Regional Policy of the European Union and the Statistical Office of the European Community—Eurostat [63]. The Urban Statistics (Urban Audit) program is implemented by national statistical offices and Eurostat is the coordinator of all activities. The subject of research in the program is quality of life and the object is city and urban residents. The goal of the program is to obtain objective and comparable statistical data. In subsequent years, the program has evolved in terms of space and content. A definition of city was reached and it was possible to define three spatial levels: cities within administrative boundaries (core city, CC), larger urban zones (larger urban zone, LUZ), which are areas of influence of urban agglomerations, and sub-city districts (SCD) [64]. Data were collected in all the indicated units. The data included: demographics, nationality, household structure, labor market and unemployment, income, inequality and poverty, housing, health, crime, employment, economic activity, citizen involvement, education, education levels, air and noise quality, water, waste management, land use, outbound tourism, energy consumption, climate and geography, culture and leisure [61]. In the next stage of the program's development, two units were defined. Currently, the project collects data for two spatial levels: cities within administrative boundaries (city, C) and Functional Urban Area (FUA, formerly larger urban zone (LUZ)), which are areas of urban influence. Currently, 900 cities are surveyed under the program, including 68 cities in Poland [65]. The research area was expanded beyond the European Union. Cities in Turkey, Norway, Iceland and Switzerland were also surveyed. The Urban Statistics (Urban Audit) program provides objective indicators of quality of life. To date, nine editions of the program have been conducted. The tenth edition of the program has now been launched (data are being collected for 2021–2022) [66].

Another universal tool for studying quality of life at the city level is ISO 37120 Sustainable development of communities—Indicators for city services and quality of life. This standard was developed in 2014 and is used for the detailed assessment of the specific areas of city activities. In 2018, the second edition of this standard was released. The

criteria used in the standard allow for observation and assessment of changes on an annual basis, and provide the opportunity to compare results with other cities [67]. The standard defines 100 indicators, including the methodology for their calculation. These indicators can be used by cities of different sizes to measure their level of development from the following points of view: social, economic and environmental [68,69]. All indicators have been grouped into 17 thematic areas concerning the city: economy, education, energy, environment, finance, crisis management, local government bodies, recreation, security, solid waste, telecommunications and innovation, transportation, urban planning, wastewater management and water and sewage management. The indicators are divided into 46 primary and 54 secondary indicators [70]. These indicators can be used to manage a city and for comparisons with other cities [71,72]. To use the standard in cities that use indicators to different extents, certification levels have been introduced. Depending on the number of indicators monitored, five levels of implementation of the ISO 37120 standard have been defined. The first level, defined as aspirational, requires the use of 30 to 45 core indicators. The second level—bronze—requires the use of 46–59 indicators, including 46 core indicators and 0 to 13 supplementary indicators. The third level—silver—requires the use of 60 to 75 indicators, including 46 core indicators and 14 to 29 supplementary indicators. The fourth—gold—requires 76 to 90 indicators, including 46 basic indicators and 30 to 44 supplementary indicators. The fifth and highest level, called platinum, requires 91 to 100 indicators, including 46 basic and 45 to 54 supplementary [70]. The main advantage of this approach is the ability to compare results and benchmark data between cities that have undergone certification [67,72]. A significant problem that arises in this situation is the availability of data. To ensure that data can be openly accessed, the World Council on City Data (WCCD) open data platform was launched. This platform is responsible for coordinating all data obtained from cities. Cities that have obtained ISO 37120 certification are added to the organization's Global Cities Registry™ database for a period of one year. After this period, they should undergo another certification process.

There are other methods of collecting data for assessing the objective evaluation of quality of life, such as surveys carried out at the level of the European Union, government surveys of individual countries, surveys of offices and commercial surveys, which, however, due to the volume of the study, are not presented in this paper. Some of these studies are presented in the earlier publication by Ligarski and Wolny [43].

Data for the subjective assessment of quality of life at the city level is provided primarily by surveys conducted by city offices. It is important that these surveys provide substantive information that, once processed, can be used for the needs of the city. In order to obtain such information, attention should be paid to the development of a research plan and the choice of the frequency of its conduct, the appointment of a person responsible for conducting the research and, later, the interpretation of the results obtained, the selection of the method or methods of contacting residents, good preparation of the research tool, the determination of the size of the research sample and the criteria for its selection, and the proper conditions for conducting the survey [73,74]. All these elements affect the quantity and quality of the data obtained. Most publications on urban quality-of-life surveys note the need for the good preparation of these surveys [33–42]. City halls approach the study of the quality of life of their residents in different ways and obtain different results from these studies.

### 3. Materials and Methods

The second stage of research, whose results are presented in this paper, was designed to be a continuation and expansion of the first stage. In the first stage, only cities that conduct formalized quality-of-life surveys were surveyed. In the second stage of the study, the research was planned to be conducted in two groups of cities, the first that conducts formalized quality-of-life surveys and the second that does not. The organization of the research process can be presented in the following steps:

1. Literature overview.
2. Selection of the cities to be surveyed.
3. Development of the research methodology.
4. Research on understanding the areas that affect quality of life.
5. Surveys of the declared impact of the local government on the quality of life of residents.
6. Summary of the research results.

The objects of the research are city offices in Poland. According to the assumptions of the two stages of the research, the sample should be relatively large and based on larger cities. In Poland, there are 84 cities with a population of more than 50,000. All 84 were selected to be surveyed. The research was conducted on a sample of 84 city offices. A research methodology was developed and research questions were formulated.

The following research questions (RQ) were formulated:

RQ 1: How do the two groups of cities, those that conduct and do not conduct formalized quality-of-life surveys, view the areas that affect quality of life and their importance?

RQ 2: How do the two groups of cities, those that conduct and those that do not conduct formalized quality-of-life surveys, determine the impact of the local government on the residents' quality of life in specific aspects?

A survey was selected as the research tool, as in the first stage of the research. The assumption was made to use as many questions as possible from the original survey form. Such a procedure is intended to facilitate the comparison of results. The author's survey form, used in the first stage of the research, was modified to conduct the research on the two groups of cities: those that conduct and do not conduct formalized quality-of-life surveys. The survey form contained a total of 30 closed questions. For the purposes of this study, 10 questions from the survey form were used. Several questions allowed respondents to provide their own answer in the "other" category. The survey was anonymous and cities did not provide respondent names. At the end of the form, a note was included, asking respondents to select the group in which the city falls by size, income per capita and the province in which it is located. A bidding process was conducted to select a professional organization to conduct surveys in city offices. The survey form was addressed to those who, at the level of the city office, conduct quality-of-life surveys or are responsible for collecting such information. The survey ran from December 2021 to January 2022, and resulted in 80 responses from city offices, a return rate of 95.2%.

The results obtained in the study were developed using the R language version 4.1.2 [75] and packages included in the tidyverse collection of packages [76]. A five-point Likert scale was adopted for most questions. For responses to questions about the impact and importance of individual areas on quality of life and the impact of the local government on individual areas, the results were aggregated by calculating the mean and standard deviation. The results are summarized in the following tables. A Mann–Whitney U-test (to assess the significance of differences in the areas rated) and the binomial test (to assess whether the proportion of cities rating the above-mentioned areas is significantly different than 0.5) were used to check the results of the cities in both groups. Spearman's rank correlation coefficient was used to assess the consistency of the ratings of each area in the two groups of cities.

#### 4. Results

In the survey, 80 city halls responded, of which 29 declared that they conduct formalized quality-of-life surveys and 51 stated that they do not. Based on this, two groups of cities were identified, the first that conducts formalized quality-of-life surveys and the second that does not, and a survey procedure was conducted for these groups.

The first issue to be examined was the understanding of the areas that affect quality of life. Two components were taken into account. The first is whether the two groups of cities can determine what areas affect the quality of life, and the second is whether they can determine the importance of these areas. In the survey, respondents were first asked to identify the areas that affect quality of life. The authors of the survey compiled a list



of 25 areas with a potential impact on quality of life. Respondents were asked to rate the impact of each area on a five-point scale: 1, definitely not; 2, probably not; 3, neither yes nor no; 4, probably; and 5, definitely yes. The results obtained, ranked according to the mean value for the two groups of organizations surveyed, including the standard deviation, are presented in Table 1. This presentation is intended to compare the results for the group conducting and not conducting formalized quality-of-life surveys.

**Table 1.** Summary of the answers to the question of whether the indicated areas affect quality of life in the city in two groups of cities.

Cities That Conduct Formalized Quality-of-Life Surveys (N = 29)				Cities That Do Not Conduct Formalized Quality-of-Life Surveys (N = 51)			
No.	Do the Given Areas, in Your Opinion, Affect the Quality of Life in the City?	Mean	Standard Deviation	No.	Do the Given Areas, in Your Opinion, Affect the Quality of Life in the City?	Mean	Standard Deviation
1	public safety	4.69	0.471	1	public safety	4.86	0.348
2	education	4.62	0.494	2	education	4.80	0.401
3	future perspectives	4.62	0.561	3	transport and communication	4.63	0.564
4	health	4.59	0.628	4	health	4.63	0.564
5	transport and communication	4.55	0.506	5	housing	4.55	0.702
6	housing	4.45	0.736	6	leisure opportunities	4.55	0.642
7	leisure opportunities	4.41	0.682	7	future perspectives	4.53	0.731
8	living conditions in the city	4.41	0.946	8	living conditions in the city	4.51	0.731
9	working conditions in the city	4.38	0.728	9	working conditions in the city	4.47	0.731
10	spatial planning and architecture	4.24	0.636	10	service and commercial infrastructure	4.37	0.692
11	public administration	4.21	0.726	11	entrepreneurship	4.37	0.631
12	service and commercial infrastructure	4.17	0.759	12	spatial planning and architecture	4.29	0.642
13	entrepreneurship	4.10	0.772	13	environmental protection	4.27	0.850
14	waste management	4.03	1.052	14	waste management	4.24	0.737
15	science	3.97	0.731	15	public administration	4.22	0.702
16	environmental protection	3.97	1.017	16	water management	4.18	0.865
17	sport and recreation	3.97	0.823	17	science	4.18	0.740
18	culture and protection of national heritage	3.86	0.833	18	sport and recreation	4.18	0.793
19	civil society	3.86	0.915	19	information technologies	3.90	0.944
20	water management	3.83	1.037	20	climate and geographic location	3.82	0.974
21	social assistance	3.79	0.940	21	culture and protection of national heritage	3.82	0.817
22	technical services	3.79	0.675	22	civil society	3.78	1.119
23	information technologies	3.62	0.979	23	technical services	3.73	0.750
24	climate and geographic location	3.48	1.022	24	social assistance	3.69	0.990
25	tourism and promotion	3.38	0.862	25	tourism and promotion	3.51	1.027

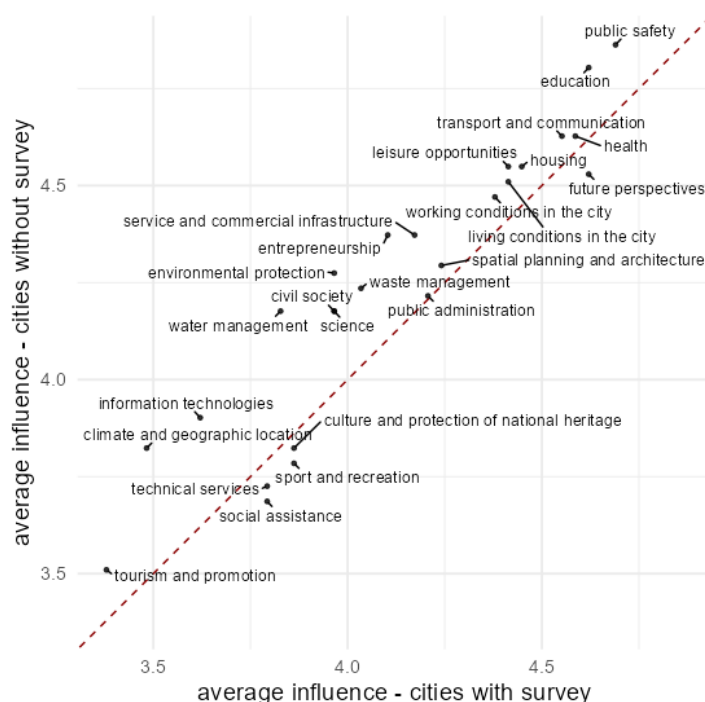
The first observation from the results is the high similarity of results for the two groups of surveyed offices. Both cities with and without formalized quality-of-life surveys similarly assess the impact of individual areas on quality of life (Spearman's rank correlation coefficient is 0.95,  $p$ -value < 0.001). Considering the average, the surveyed areas can be divided into three groups. The first group is the areas that obtained a mean above 4.5, which can be considered areas that have a high impact on quality of life. Among the first group of surveyed authorities, five such areas were indicated, and among the second group, eight. Interestingly, all areas indicated by respondents in cities that conduct formalized surveys were also indicated by respondents in cities that do not conduct formalized surveys. Regardless of the group used, cities believe that public safety, education, future prospects, health, transportation and communication have a high impact on quality of life in the city. The second group, in which the average value was above 4 and below 4.5, can be considered to have areas that affect quality of life to an average degree. Cities in the first group identified 9 such areas and cities in the second group identified 10 areas. They had many similarities and differences. An example is environmental protection, whose impact was rated relatively high by cities that do not conduct formalized surveys and was omitted from this group by cities that conduct formalized quality-of-life surveys. The third group, in which the average value is below 4.0, can be considered areas with no clear impact on the quality of life. Some cities believe that these areas affect quality of life, while others take the opposite view. Within this group, the first group of cities indicated 11 areas and the second group of cities indicated only 7 areas. The differences in the assessment of the impact of individual areas on quality of life are the greatest in this group. Summarizing the comparison conducted, it should be said that cities that do not conduct formalized quality-of-life surveys indicate more areas in the first two groups, and usually, the average assessment of the impact of an area is higher. This means that this group of cities indicated more areas that affect quality of life compared to the group of cities that conduct formalized surveys and higher average ratings of the impact of most areas on quality of life.

To assess whether there were significant differences between the group of cities that conduct formalized quality-of-life surveys and those that do not conduct such surveys, the significance of the difference in diameters in each area was calculated using a Mann–Whitney test. After checking the  $p$ -value in all areas, it was found that no significant difference was present (the  $p$ -value in no area is less than 0.05); Therefore, there are no significant differences regarding the perceptions of areas that affect quality of life in cities that conduct and do not conduct formalized quality-of-life surveys. Despite the lack of significant differences in the averages in each area, it can be seen that most areas received a higher rating than those by cities that do not conduct quality-of-life surveys. Figure 1 shows the average rating of each area's impact on quality of life by cities that conduct quality-of-life surveys (X-axis) and cities that do not (Y-axis).

The figure shows that cities that conduct formalized quality-of-life surveys provided a higher rating to only five areas. In contrast, cities that do not conduct formalized quality-of-life surveys ascribed a higher rating to 20 areas. To test whether such a difference could be considered random, a binomial test was used. The following hypotheses were tested: a null hypothesis, which assumes that the probability that an area will be rated higher by cities that do not conduct formalized quality-of-life surveys is 0.5, against the alternative hypothesis, which assumes that this probability is greater than 0.5. The obtained  $p$ -value of 0.002 indicates that it is very unlikely that such a result would be obtained if the null hypothesis is true. Therefore, it can be concluded that cities that do not conduct formalized quality-of-life surveys for more areas rate their impact on quality of life higher than cities that conduct them.

To assess whether cities could determine the importance of areas that affect quality of life, the respondents were asked to rate the importance (relevance) of each of the 25 areas proposed by the survey authors. The respondents were asked to rate the importance (relevance) of each area on a five-point scale: 1, definitely unimportant; 2, probably unimportant; 3, neither important nor unimportant; 4, probably important; and 5, definitely

important. The results obtained, ranked according to the mean value for the two groups of organizations surveyed, including the standard deviation, are presented in Table 2.



**Figure 1.** Average rating of the impact of each area on the quality of life in both groups of cities.

From the table, it can be observed that there is a high similarity in the results for the two groups of surveyed offices. Both cities with and without formalized quality-of-life surveys rate the importance of each area similarly (Spearman's rank correlation coefficient is 0.90;  $p$ -value < 0.001). Considering the average, the surveyed areas can be divided into three groups. The first group is the areas that received a mean of over 4.5, which can be considered areas whose importance according to the offices is at a high level. In this group, both cities with and without formalized surveys indicated seven areas. Five of the seven areas indicated were exactly the same. The cities in the two groups stated that living conditions in the city, public safety, health, leisure opportunities, future prospects and education have the highest importance for the quality-of-life assessment. The second group, in which the average value was above 4 and below 4.5, is the areas whose importance in the assessment of quality of life is at the average level. In this group, the cities that conduct formalized surveys indicated 6 areas and cities that do not conduct formalized surveys indicated 11 areas. The differences between cities in this group are greater. The third group, in which the average value is below 4.0, can be considered as areas whose importance for assessing the quality of life is not clear. Some cities believe that these areas are important for assessing the quality of life and some hold that they are unimportant for assessing the quality of life. In this group, cities that conduct formalized quality-of-life surveys indicated 12 areas and cities that do not conduct formalized surveys indicated only 7 areas. The differences in the assessment of the importance of individual areas appear to be the greatest in this group. In summary, it should be noted that cities that do not conduct formalized surveys indicated more areas in the second group and fewer in the third. These cities also tend to indicate a higher average importance of a given area in the quality assessment. This means that this group of cities indicated more areas as having importance in the assessment of quality of life compared to the group of cities that conduct formalized surveys and a higher average importance to most areas that affect quality of life.



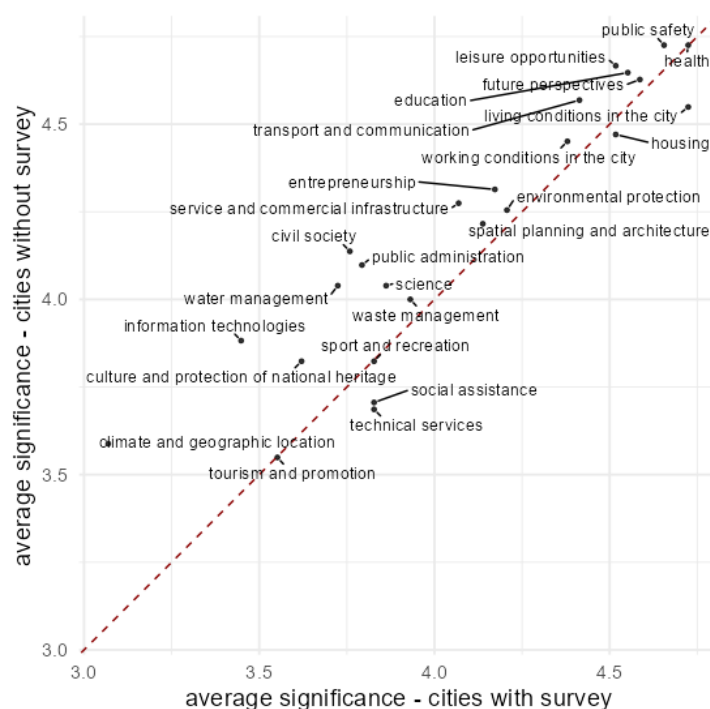
**Table 2.** Summary of the responses to the question on the importance of each area in assessing the quality of life for the two groups of cities.

Cities That Conduct Formalized Quality-of-Life Surveys (N = 29)				Cities That Do Not Conduct Formalized Quality-of-Life Surveys (N = 51)			
No.	What Is, in Your Opinion, the Importance (Significance) of These Areas in Assessing the Quality of Life in the City?	Mean	Standard Deviation	No.	What Is, in Your Opinion, the Importance (Significance) of These Areas in Assessing the Quality of Life in the City?	Mean	Standard Deviation
1	living conditions in the city	4.72	0.591	1	public safety	4.73	0.451
2	health	4.72	0.528	2	health	4.73	0.451
3	public safety	4.66	0.484	3	leisure opportunities	4.67	0.476
4	future perspectives	4.59	0.568	4	education	4.65	0.483
5	education	4.55	0.506	5	future perspectives	4.63	0.564
6	housing	4.52	0.634	6	transport and communication	4.57	0.608
7	leisure opportunities	4.52	0.509	7	living conditions in the city	4.55	0.673
8	transport and communication	4.41	0.780	8	housing	4.47	0.731
9	working conditions in the city	4.38	0.775	9	working conditions in the city	4.45	0.730
10	environmental protection	4.21	0.774	10	entrepreneurship	4.31	0.707
11	entrepreneurship	4.17	0.759	11	service and commercial infrastructure	4.27	0.723
12	spatial planning and architecture	4.14	0.639	12	environmental protection	4.25	0.845
13	service and commercial infrastructure	4.07	0.753	13	spatial planning and architecture	4.22	0.702
14	waste management	3.93	1.033	14	sport and recreation	4.14	0.872
15	science	3.86	0.693	15	public administration	4.10	0.700
16	social assistance	3.83	0.848	16	water management	4.04	0.916
17	civil society	3.83	0.805	17	science	4.04	0.848
18	technical services	3.83	0.602	18	waste management	4.00	0.872
19	public administration	3.79	0.774	19	information technologies	3.88	0.840
20	sport and recreation	3.76	0.951	20	culture and protection of national heritage	3.82	0.713
21	water management	3.72	1.032	21	civil society	3.82	1.090
22	culture and protection of national heritage	3.62	0.862	22	social assistance	3.71	0.944
23	tourism and promotion	3.55	0.736	23	technical services	3.69	0.787
24	information technologies	3.45	1.055	24	climate and geographic location	3.59	1.134
25	climate and geographic location	3.07	1.280	25	tourism and promotion	3.55	0.945

To assess whether there were significant differences between the group of cities that conduct formalized quality-of-life surveys and the group that does not conduct such surveys, the significance of the difference in diameters in each area was calculated using a Mann–Whitney test. After calculating the  $p$ -value in all areas, it was found that there was no significant difference (the  $p$ -value in no area was less than 0.05), which means that there are no significant differences regarding the assessment of areas that affect quality of life in cities that conduct and do not conduct formalized quality-of-life surveys. As with the impact assessment, despite the lack of significant differences in the averages in each area, it can be seen that most areas received a higher rating than those by cities that do not conduct quality-of-life surveys. Figure 2 shows the average rating of each area's relevance by cities that conduct quality-of-life surveys (X-axis) and cities that do not (Y-axis).

Cities that conduct formalized quality-of-life assessments provided a higher rating to only six areas. In contrast, cities that do not conduct formalized quality-of-life surveys provided a higher rating to 19 areas. As before, a binomial test was used to test whether such a difference could be considered random. The following hypotheses were tested: a null hypothesis, which assumes that the probability that an area will be rated higher for relevance by cities that do not conduct formalized surveys of quality of life is 0.5, against the alternative hypothesis, which assumes that this probability is greater than 0.5. The obtained  $p$ -value of 0.0073 indicates that it is very unlikely that the obtained result would occur if the null hypothesis is true. Therefore, it can be concluded that cities that do not

conduct formalized quality-of-life assessments for more areas provide a higher rating to their relevance to quality of life in comparison to cities that conduct such studies.



**Figure 2.** Average rating of the relevance of each area on quality of life in both groups of cities.

To summarize the understanding of the areas that influence quality of life, it was found that cities with and without formalized quality-of-life surveys have similar perceptions of the areas that influence quality of life and the importance of these areas; no significant differences were found in any of the areas surveyed. On the other hand, it was found that cities that do not conduct formalized quality-of-life surveys rated the impact and importance of most areas affecting the quality of life higher. Thus, the answer to the first research question, RQ 1, was obtained.

The other issue surveyed was to determine how two groups of cities, those that conduct and do not conduct formalized surveys, determine the impact of the local government on the residents' quality of life in specific aspects. The survey asked the respondents to determine the impact of the local government on the residents' quality of life in selected aspects. The authors of the survey compiled a list of 16 aspects in which the local government can potentially affect the lives of the residents. The respondents were asked to rate the impact of each aspect on a five-point scale: 1, definitely not; 2, probably not; 3, neither yes nor no; 4, probably; and 5, definitely yes. The results obtained, ranked according to the mean value for the two groups of organizations surveyed, including the standard deviation, are presented in Table 3.

Regarding the analysis of the results, it can be seen that there are greater differences between the two groups of cities than in the responses to the earlier questions. Although the Spearman's rank correlation coefficient is also high (0.86,  $p$ -value < 0.001), cities with formalized quality-of-life surveys provided a significantly higher rating to the local government's impact on the residents' quality of life. Considering the average, the results can be divided into three groups. The first group consists of aspects that received a mean of over 4.5, which can be considered aspects that have a high impact on quality of life. Cities with formalized surveys indicated seven aspects, while cities without formalized surveys did not indicate a single one. This shows that only cities conducting formalized surveys are able to identify aspects that have a high impact on quality of life. The second group is aspects with an average value above 4 and below 4.5 can be considered aspects that

affect quality of life to an average degree. Cities that conduct structured surveys indicated 5 aspects, and cities that do not indicated as many as 10. The last group, with an average value of less than 4.0, can be considered as the areas with no clear impact on quality of life. Cities that conduct formalized surveys indicated four aspects and cities that do not indicated six. Thus, there are large differences between the groups. In summary, it should be noted that cities that conduct formalized surveys of quality of life definitely rate all aspects that affect the quality of life higher.

**Table 3.** Summary of the responses to the question of whether a local government has an impact on the quality of life for the two groups of cities.

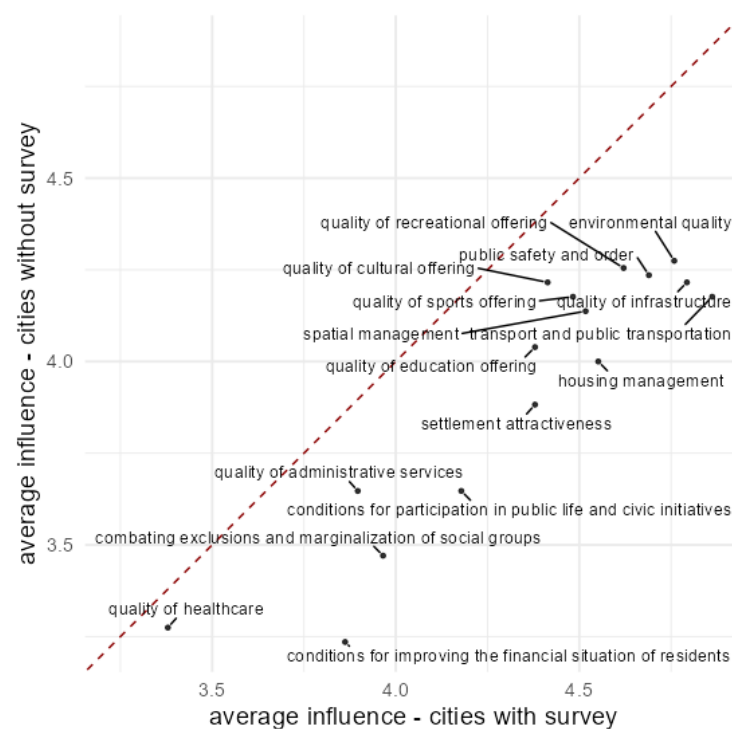
Cities That Conduct Formalized Quality-of-Life Surveys (N = 29)				Cities That Do Not Conduct Formalized Quality-of-Life Surveys (N = 51)			
No.	In Your Opinion, in the City, Does the Local Government Have an Impact on the Quality of Life in the Following Aspects:	Mean	Standard Deviation	No.	In Your Opinion, in the City, Does the Local Government Have an Impact on the Quality of Life in the Following Aspects:	Mean	Standard Deviation
1	transport and public transportation	4.86	0.351	1	quality of administrative services	4.27	1.002
2	quality of infrastructure	4.79	0.412	2	quality of recreational offering	4.25	0.688
3	quality of administrative services	4.76	0.511	3	public safety and order	4.24	0.764
4	public safety and order	4.69	0.471	4	quality of infrastructure	4.22	0.901
5	quality of recreational offering	4.62	0.561	5	quality of cultural offering	4.22	0.757
6	housing management	4.55	0.736	6	quality of sports offering	4.18	0.713
7	spatial management	4.52	0.688	7	transport and public transportation	4.18	0.994
8	quality of sports offering	4.48	0.574	8	spatial management	4.14	0.917
9	quality of cultural offering	4.41	0.568	9	quality of education offering	4.04	0.871
10	settlement attractiveness	4.38	0.677	10	housing management	4.00	1.000
11	quality of education offering	4.38	0.561	11	settlement attractiveness	3.88	0.864
12	conditions for participation in public life and civic initiatives	4.18	0.612	12	environmental quality	3.65	0.868
13	combating exclusions and marginalization of social groups	3.97	0.731	13	conditions for participation in public life and civic initiatives	3.65	1.036
14	environmental quality	3.90	0.772	14	combating exclusions and marginalization of social groups	3.47	1.084
15	conditions for improving the financial situation of residents	3.86	0.789	15	quality of healthcare	3.27	0.940
16	quality of healthcare	3.38	0.903	16	conditions for improving the financial situation of residents	3.24	0.992

To assess whether there were significant differences between the group of cities that conduct formalized quality-of-life surveys and those that do not, the significance of the mean differences in each aspect was tested using a Mann–Whitney test. The results, ranked taking into account the *p*-value, are summarized in Table 4.

**Table 4.** Mann–Whitney test results for the individual aspects that affect quality of life.

No.	Aspect That Affects Quality of Life	<i>p</i> -Value
1	transport and public transportation	0.0004
2	conditions for improving the financial situation of residents	0.0010
3	quality of infrastructure	0.0012
4	public safety and order	0.0058
5	housing management	0.0063
6	settlement attractiveness	0.0094
7	quality of recreational offering	0.0148
8	quality of administrative services	0.0162
9	conditions for participation in public life and civic initiatives	0.0253
10	combating exclusions and marginalization of social groups	0.0440
11	spatial management	0.0617
12	quality of sports offering	0.0618
13	quality of education offering	0.1144
14	environmental quality	0.2677
15	quality of cultural offering	0.3224
16	quality of healthcare	0.8897

By analyzing the results of the Mann–Whitney test, it can be observed that, for 10 aspects, the *p*-value obtained a value lower than 0.05. Thus, a significant difference was found in 10 aspects. Such a result indicates that there are significant differences in the evaluation of aspects that have an impact on the quality of life in cities with and without formalized surveys. On the other hand, to illustrate that the average rating of the impact of an aspect is higher for cities that conduct formalized quality surveys, Figure 3 shows the average rating of the local government’s impact in each area in the group of cities that conduct formalized quality of life surveys (X-axis) and in that of cities that do not (Y-axis).

**Figure 3.** Average rating of the local government’s influence on each aspect of quality of life in both groups of cities.

The chart shows that cities with formalized quality-of-life surveys provide higher ratings to all aspects.

To summarize the declared impact of local government on the quality of life of residents, it was found that cities with and without formalized quality-of-life surveys define the impact of the local government on residents' quality of life differently; significant differences were found in 10 out of the 18 aspects surveyed. It was also found that cities that conduct formalized quality-of-life surveys in all aspects rated the influence of the local government on the quality of life of residents significantly higher. Thus, the answer to the second research question, RQ 2, was obtained.

## 5. Discussion

The study provided an opportunity to compare two groups of cities, the first that conducts formalized quality-of-life surveys and the second that does not conduct formalized quality-of-life surveys.

The first issue examined was to understand the areas that affect quality of life in two groups of cities. The focus was on two components. The first is whether cities are able to identify the areas that affect quality of life. The second is whether cities are able to determine the importance of these areas. The results confirm that the two groups of cities have similar perceptions of the impact and importance of each of the proposed 25 areas. No significant differences were found in any of the areas. The two surveyed groups of cities identified two groups of areas that affect quality of life to a high and average degree. A third group of areas was also identified, for which no clear impact on quality of life was determined. It was found that cities without formalized quality-of-life surveys tended to indicate a greater number of areas in the first two groups. The implication is that cities without formalized surveys declare that quality of life is affected by a greater number of areas. It was also found that, in this group of cities, the influence and importance of most areas that affect quality of life are rated higher. This means that this group of cities provide higher rates than the majority of areas and thus their impact on quality of life. Based on this, it can be concluded that cities without formalized surveys state that quality of life is influenced by a greater number of areas and the influence of these areas is greater. Such a conclusion is consistent with the results of other studies. Research on groups of cities that conduct formalized quality-of-life surveys have shown that quality of life is affected by a wide variety of factors and conditions, and a broad spectrum of areas should be used for research [33,34,37,38]. The developed data collection models for the study of quality of life pay attention to the use of as many areas as possible [36,43]. Thus, it can be concluded that cities that do not conduct formalized surveys understand the impact and importance of the areas that affect quality of life in the right way. However, a second question immediately arises, of why cities that conduct formalized quality-of-life surveys indicate a smaller number of areas that affect quality of life and describe their impact as lower. There are probably several reasons for this approach. One reason is to be found in the practice of conducting quality-of-life surveys. Cities that conduct formalized quality-of-life surveys use only selected areas for this study [33,34,43]. Cities usually consciously choose to conduct surveys in selected, relatively few areas. This practice most likely projects an understanding of the areas that affect quality of life later.

The second issue examined was the impact of the local government on the quality of life of the residents in the two groups of cities. The focus was the local government's impact on 16 aspects. Based on the results, it was found that there were significant differences in the assessment of aspects in the two groups of cities. Cities that conduct formalized quality-of-life surveys rated the influence of the local government on the quality of life of the residents significantly higher. These cities were able to identify seven aspects that highly influence quality of life. Cities without formalized quality-of-life surveys were unable to identify such aspects. When analyzing the differences between the two groups of cities, significant differences were found in 10 of the analyzed aspects. Cities conducting formalized surveys rated the influence of the local government on the quality of life significantly higher in all 16 aspects studied. Such results indicate that cities that conduct quality-of-life surveys in a formalized manner perceive better the influence of the local government on the quality of



life of residents. Conducting surveys in a structured manner on a cyclical basis provides more opportunities to use the obtained data. An office with a permanent mechanism for obtaining data is better able to assess the impact of the city's activities on the residents' quality of life in the long term. This is also confirmed by the results of other studies conducted on the quality of life at the city level [36,38,39]. Conducting formalized surveys provides more opportunities to have a real impact on the residents' quality of life. City halls that conduct quality-of-life surveys on a non-cyclical, non-formalized basis have fewer opportunities to properly process and use the data obtained. The results obtained draw attention to the need for formalized quality-of-life surveys in every city office.

## 6. Conclusions

A modern city needs to obtain information from various sources in order to develop. At present, considerable attention is paid to using information obtained from citizens and involving them in the development of the city. One of the methods of obtaining information from residents is research on the quality of life. These surveys provide a variety of information that can be used for the city's sustainability needs in areas such as transport, public safety and the environment. The research team developed a research concept to determine how city offices conduct quality-of-life surveys and later use this information. This paper presented the results of the research for two groups of cities, cities that conduct formalized quality-of-life surveys and cities that do not. The division into these two groups for research represents an original approach to research and provides new insights.

First, it allows a comparison of the understanding of the areas that affect quality of life in two groups of cities. Understanding the areas that affect quality of life is a very important factor in planning quality-of-life surveys. If the right city understands the areas that affect quality of life and includes a broad spectrum of these areas in its research, it can create a sufficient database for further analysis. On the other hand, if it focuses only on selected areas, it will obtain fragmentary, incomplete data, which, after analysis, will be available only in few spheres of its activities. The results obtained from the study allow us to conclude that the understanding of the areas that affect quality of life in the two groups of organizations studied is similar. No significant differences were found in any of the areas studied. On the other hand, it was found that cities that do not conduct formalized quality-of-life surveys state that quality of life is influenced by a greater number of areas, and in most areas, they rate this influence as higher. Such a result may be surprising. Cities that do not conduct formalized surveys are better able to interpret the areas that affect quality of life. This means that cities that conduct quality-of-life surveys realize that quality of life is influenced by many areas that should be included in planned surveys. This raises the possibility that, if these cities decide to conduct formalized quality-of-life surveys, then they should include a broad spectrum of areas that affect quality of life. However, the question remains, of why cities that conduct formalized surveys interpret the areas that affect quality of life more poorly. There are probably several reasons for this. One reason is to be found in the practice of conducting quality-of-life surveys. The results of studies on cities that conduct formalized quality-of-life surveys indicate that cities tend to consciously select only selected areas for study [33,34,43]. This practice results in these cities interpreting fewer and fewer areas that they believe affect the quality of life over time.

Secondly, it makes it possible to determine the declared influence of the local government on the quality of life of its citizens for two groups of cities. The declared influence of the local government is a determination of the aspects in which the city influences the lives of its citizens. It is a type of reflection on whether the actions taken by the authorities have a real impact on the quality of life of residents. Such a declaration can be regarded as a kind of evaluation of the actions taken before the office. The results of the survey confirm that cities that conduct formalized surveys have a significantly higher assessment of the impact of the local government on the quality of life of residents. Conducting formalized surveys provides an opportunity to conduct cyclic surveys and obtain information at scheduled intervals that can be used by the office. Such a practice provides more opportunities to

use the data. Even if the data are used only to assess the satisfaction of residents, evaluate the achievements of the city government and determine indicators, the real importance of this type of information becomes apparent. The office, with the passage of time, becomes convinced that it is worth collecting this type of information and that it has a real impact on the quality of life of residents. In contrast, cities that do not conduct formalized surveys do not have this type of experience and it is definitely more difficult for them to assess the impact of the local government on the quality of life of residents. The results obtained can be taken as a confirmation of the need for formalized quality-of-life surveys. Each city office should plan and conduct formalized surveys to obtain information periodically that can be used in various spheres of its activities. Obtaining and using this type of information provides an opportunity for the local government to have a real impact on the quality of life of its residents.

The following addresses the limitations of the research conducted. The research carried out provided basic information on the understanding of the areas that affect quality of life in two groups of cities. Further research is planned to analyze in detail the factors that influence quality of life and their use for sustainable urban development. In particular, we plan to examine factors such as public safety, transport and communication, information technology and environmental protection.

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