

CAN SUSTAINABLE URBAN PLANNING DETERMINE PEOPLE'S HAPPINESS AND WELL-BEING?

O PLANEJAMENTO URBANO SUSTENTÁVEL PODE DETERMINAR A FELICIDADE E O BEM-ESTAR DAS PESSOAS?

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ABSTRACT

Purpose – This study was designed to present how urban planning is associated with, and explain psychological well-being, health, time use, education, cultural diversity and resilience, community vitality, good governance, ecological diversity, resilience, and living standards. We used Gross National Happiness Index (GNH) as theoretical background.

Design/methodology/approach – Quantitative and explanatory research was conducted and operationalized through a survey of 212 citizens. We used data from a mid-sized city, inner Santa Catarina state, Brazil.

Findings – The linear regression showed that urban planning predicts happiness and well-being. More specifically, urban planning impacts more time use perception; community vitality; ecological diversity and resilience; and most important, living standards.

Research implications – we found that urban planning impacts more on the variables that are directly related to the environment, explained by the pillars of sustainable socio-economic development and environmental conservation. The individual and psychological dimensions related to health, culture, and education don't show the same impact, as well as good governance.

Originality/value: a potential study to be used by government agencies to act directly in the elaboration of public policies once it is understood that using the GNH can identify specific deficits.

Keywords: Economic Development. Sustainability. Gross National Happiness Index.

RESUMO

Objetivo – Este estudo está desenhado para compreender como o planejamento urbano pode determinar a percepção de saúde, governança, educação, padrão de vida, vitalidade da comunidade e da diversidade ecológica. Foi utilizado como teoria de base para a análise, a Felicidade Interna Bruta.

Design/ metodologia – Foi realizada uma pesquisa quantitativa e explicativa, operacionalizada por meio de uma pesquisa com 212 cidadãos. Utilizamos dados de uma cidade de médio porte do interior de Santa Catarina, Brasil.

Resultados – A regressão linear mostrou que o planejamento urbano prediz a felicidade e o bem-estar. Mais especificamente, o planejamento urbano impacta mais a percepção do uso do tempo; vitalidade da comunidade; diversidade ecológica e resiliência; e o mais importante, padrão de vida.

Implicações da pesquisa – constatou-se que o planejamento urbano impacta mais as variáveis que estão diretamente relacionadas ao meio ambiente, explicadas pelos pilares de desenvolvimento socioeconômico sustentável e a conservação ambiental. As dimensões individual e psicológica relacionadas à saúde, cultura e educação não sofrem o mesmo impacto, assim como a boa governança.

Originalidade/valor: um estudo potencial a ser utilizado por órgãos governamentais para atuar diretamente na elaboração de políticas públicas, uma vez que se entende que com o uso do FIB é possível identificar déficits específicos.

Palavras-chave: Desenvolvimento Econômico. Sustentabilidade. Felicidade Interna Bruta.

1 INTRODUCTION

Contemporary urban economists observe cities' unique capability to concentrate and produce economic wealth (Savini, 2021), once, in history, cities are defined as economic 'triumphs' (Glaeser, 2012). As consequence, urban development is less a product than a driver of economic growth (Savini, 2021).

Based on this assumption, this study was designed to present how urban planning is associated with and explain psychological well-being, health, time use, education, cultural diversity and resilience, community vitality, good governance, ecological diversity, and resilience, and last, living standards – based on Gross National Happiness Index (GNH).

It should be noted that economic growth and development are generally measured by Gross Domestic Product (GDP), and despite growing recognition that GDP measures everything, deeper and meaningful aspects of life are not captured by this monetary measure. Moreover, conventional development approaches continue to centrally measure poverty, implement policy and operationalize practice in narrow economic and technical terms, without adequate attention paid to the holistic and interconnected nature of development as lived and experienced by those intended as its beneficiaries (Verma, 2019).

In the contemporary context, GDP measure continues to be at the forefront of developing, however advancing, Gross National Happiness Index (GNHI) emerges as a unique and holistic development approach that values the happiness and well-being of people and sentient beings (Verma, 2019). So, GNHI is a multidimensional methodology, which is used to measure the collective happiness and well-being of a population (GNH-Centre, 2022a). Based on GNH-Centre (2022b) the index is based on four pillars:

1. **Good Governance:** it determines the conditions of happiness. While policies and programs that are developed are generally in line with the values of GNH, there are also several tools and processes employed to ensure the values are indeed embedded in social policy.



2. Sustainable Socio-economic Development: A thriving GNH economy must value the social and economic contributions of households and families, free time, and leisure.
3. Preservation and Promotion of Culture: Happiness is believed to be contributed to by preserving the nation's culture. Developing cultural resilience can be understood as the culture's capacity to maintain and develop cultural identity, knowledge, and practices, and able to overcome challenges and difficulties from other norms and ideals.
4. Environmental Conservation: is considered a key contribution to GNH because, in addition to providing critical services such as water and energy, the environment is believed to contribute to aesthetic and other stimuli that can be directly healing to people who enjoy vivid colors and light, untainted breeze, and silence in nature's sound.

The four pillars are further elaborated into nine domains, which articulate the different elements of GNH in detail and form the basis of GNH measurement, indexes, and screening tools, being: living standards; education health; environment; community; vitality; time-use; psychological well-being; good governance; cultural resilience and promotion. These domains, demonstrate that from the perspective of GNH, many inter-related factors are important in creating the conditions for happiness (GNH-Centre, 2022c).

Many researchers have explored in the last years the way GNH theorizes, intersects with, embodies, and operationalizes to assess the quality of government (Helliwell et al., 2021), culture (Thin et al., 2020), degrowth (Savini, 2021; Ritu Verma, 2017), gender barriers (Ritu Verma & Ura, 2022), national progress, sustainability and higher goals (Thinley & Hartz-Karp, 2019), and the role of freedom, activism, decentralization, volunteerism, and voter participation on happiness (Perkins et al., 2021).

Moreover, GNH has been adopted and encouraged as a set of secular concepts that are applicable to many contexts around the world (Verma, 2019), including Brazil (e.g., Del Bianco et al., 2016; Ito et al., 2014; Ribeiro & Lemos Marinho, 2017). However, in Brazilian and in the international context, the theme is subject to superficial and problematic analysis in scholarly writing as well as hurried comprehension, especially in the international mass and social media lacking due diligence (Verma, 2019).

This study is motivated also by the fact that making cities and human settlements inclusive, safe, resilient, and sustainable is part of the United Nations 2030 Agenda (United Nations, 2022). GNH is prone to popular misunderstandings of its concept, principles, and other manifestations (Verma, 2019). In doing so, the paper aims to contribute to a growing body of scholarly literature on GNH, by designing explanatory approach on the way it is conceptualized, operationalized, practiced, and it is refined, and deepened over time, using urban planning as an independent variable.

The rise of urban populations worldwide, caused by population growth and urbanization processes, makes the urban quality of life relevant to more and more people. Also, the physical characteristics of cities change to accommodate new residents. Additionally, the Coronavirus (COVID-19) pandemic has also exerted a fundamental influence on the quality of life of almost every resident in every city around the world. A deeper knowledge of the relationship between the built environment and quality of life in cities can play a catalytic role in shaping the present and future urban development (Mouratidis, 2021).



2 CONCEPTUAL FRAMING: HAPPINESS, WELL-BEING, AND DEVELOPMENT BY GROSS NATIONAL HAPPINESS (GNH)

Gross National Product (GDP) has been used to measure the progress and development of countries in general. However, public managers have paid too much attention to the GDP without considering the real social welfare standards (Ribeiro & Lemos Marinho, 2017). It should be noted that the GDP does not capture existent social inequalities (Braun, 2009).

Alternatively, to the GDP, and seeking to discover social well-being levels through a subjective holistic method, in 1972, the Gross National Happiness (GNH) Index was created in Bhutan (Braun, 2009; GNH-Centre, 2022b, 2022c). The concept of Gross National Happiness Index (GNHI) implies that sustainable development needs to take a holistic approach in the progress and welfare of non-economic issues. Therefore, GNH concept is described in four pillars (good governance, sustainable socio-economic development, preservation and promotion of culture, and environmental conservation). The four pillars can be classified into nine broad domains (psychological well-being, health, time use, education, cultural diversity and resilience, community vitality, good governance, ecological diversity, and resilience, and last, and living standards) to create knowledge and reflect the holistic values of GNH (Braun, 2009; GNH-Centre, 2022a; Purnamasari et al., 2016).

A domain represented each component of welfare that refers to the fulfillment of good living conditions following the values and principles of the concept of gross national happiness (Purnamasari et al., 2016). These nine domains are comprised of 33 indicators used in assessing the GNHI - as presented and explained in Figure 1.

Gross National Happiness Index is a robust method that identifies a group. It is a flexible method that has been adapted to the needs and contexts of different contexts (Purnamasari et al., 2016; Ribeiro & Lemos Marinho, 2017).

Figure 1: Gross National Happiness Index explanation

Domain	Explanation	Indicators
Psychological Well-being	The domain attempts to understand how people experience the quality of their lives. It includes reflective cognitive evaluations such as life satisfaction, and affective reactions to life events such as positive and negative emotions. It also covers spirituality.	Life Satisfaction Positive Emotion Negative Emotion Spirituality
Health	The domain comprises of conditions of the human body and mind and thereby attempts to characterize health by including both physical and mental states. A healthy quality of life allows us to get through our daily activities without undue fatigue or physical stress.	Self-reported health status Number of healthy days Disability Mental Health
Time Use	The domain attempts to analyses the nature of time spent on work, non-work, and sleep, and highlights the importance of maintaining a harmonious work-life balance.	Work Sleep
Education	Besides incorporating formal and informal education, the domain also tries to assess different types of knowledge, values, and skills, which are mostly acquired informally.	Literacy Schooling Knowledge Value
Cultural Diversity and Resilience	The culture domain looks at the diversity and strength of cultural traditions including festivals, norms, and the creative arts.	Artisan skills Cultural participation Speak native language Code of etiquette and conduct
Community Vitality	The domain attempts to focus on the strengths and weaknesses of relationships and interaction within communities. The domain gathers information on social cohesion among family members and neighbors, and on practices like volunteering.	Donation (time & money) Safety Community relationship Family

Domain	Explanation	Indicators
Good Governance	The domain of good governance evaluates how people perceive various governmental functions in terms of their efficacy, honesty, and quality. Indicators help to evaluate the level of participation in government decisions at the local level and the presence of various rights and freedom.	Political participation Services Government performance Fundamental rights
Ecological Diversity and Resilience	The domain encompasses indicators that measure people's perceptions and evaluations of the environmental conditions of their neighborhood and assess eco-friendly behavior patterns. It also covers hazards such as forest fires and earthquakes.	Wildlife damage Urban issues Responsibility towards environment Ecological issues
Living Standards	This domain refers to the level of material comfort as measured by income, conditions of financial security, housing, and asset ownership.	Household per capita income Assets Housing

Source: (GNH-Centre, 2022a)

It is noteworthy that conventional approaches continue to centrally measure poverty, implement policy, and operationalize practice in these narrow terms, without satisfactory attention to the holistic and interconnected nature of sustainable development as lived and experienced by those intended to be its beneficiaries. GNH is a more holistic, sustainable, and equitable approach as a measure of progress (Verma, 2019).

Citizens' happiness is also one of the attributes to measure the success of government. This is because one of the government's urban development priorities offering the citizens all the required services and developing sustainable city programs and then achieving happiness standards, including poor people. Therefore, this study aimed to measure happiness by using indicators other than economics (Purnamasari et al., 2016).

3 SUSTAINABLE DEVELOPMENT, URBAN PLANNING, AND WELL-BEING

The Sustainable Development Goals (SDGs) were a follow-up of the millennium development goals that ended in 2015. They are new in (1) content (mainstreaming sustainability); (2) scope (adding new goals covering economic growth, infrastructure, industry, cities, inequality, energy, oceans, and seas, consumption and production, climate change, peace and security, access to justice, etc. and adding means of implementation and partnerships); and (3) process in which they were established (multilateral, consultative) (van Norren, 2020). The goal of sustainability is to minimize environmental impacts (such as urbanization) and maximize human well-being (Dietz & Jorgenson, 2014).

Sustainable development is practiced globally as a comprehensive strategy for promoting urban sustainability and well-being (Musa et al., 2018). The same authors explain that achieving sustainable development goals depends on the ability to monitor human well-being to track policy outcomes and the connection between ecosystems and human well-being.

Literature about urbanization, urban development, and urban planning is becoming an important discussion among nations to achieve sustainability. This is, because, with urbanization which placed the most population in the cities and urban areas, enhancing, creating healthy and viable communities has become a central focus of public policies which target city communities (Musa et al., 2018). Governments in both developed and developing countries are tasked with the increasing concern of most communities and policies about the well-being of their citizens and the need to involve the concepts of sustainability (Michael et al., 2014).

Recently, Tonne et al. (2021) reviewed the evidence on urbanization and health and sug-



gested a set of actions to promote health through sustainable urban development, being: integrated planning, evidence-based policymaking, and monitoring the implementation of policies. Likewise, Mouratidis (2021) looked for urban planning strategies for improving subjective well-being (SWB) in cities: urban nature, public; communal spaces; social interaction between neighbors; facilities and services; active travel and public transport; technology and emerging mobility; upkeep and order; noise reduction; aesthetic quality; socio-spatial equity; and urban planning processes. The author (2021) explains that urban policies, plans, laws, and regulations should consider evidence-based knowledge; knowledge transfer and interaction between planners and public), health coordinators; measurement and benchmarking of urban planning, outcomes on different spatial scales; empowerment strategies, public participation, and inclusion of vulnerable groups in the planning process.

It is noteworthy that we can't expect developing countries to achieve sustainability as easily as developed countries. Rather, we should see sustainable development to understand factors such as poverty and rapid urbanization, which indicate whether economic development is possible or not. For that reason, when seeking to achieve the SDGs. The SDGs aim for the end of poverty and, factors like poverty and rapid urbanization are still a common challenge in developing and underdeveloped countries (Rifai, 2022).

Previous studies showed that the urbanization process has increased pressure on human well-being and the ecosystem (Krekel et al., 2016), and there is a growing number of research seeking to understand the factors that influence and constitute well-being and its potential synergy with sustainability (Michael et al., 2014; Musa et al., 2018). Based on Musa et al. (2018) - developed a framework and proved that a community happiness index that integrates broad sustainability domains – human well-being and eco-environmental well-being sub-index along four sustainability dimensions (social, economic, environmental, and urban governance) captures individual subjective perceptions of their experience of communities and development impact – we developed the following central hypothesis:

H1: Sustainable urban planning predicts citizens' happiness and well-being.

4 ANALYTIC FRAMEWORK, DATA, AND METHODS

4.1 Context

Data for this study were collected from a mid-sized city inner Santa Catarina state, Brazil. In terms of GDP, the city is among the 20 largest economies in the state, and among the 4 largest exporters. The region is established in the manufacturing industry of forestry, timber, and its derivatives, such as paper and plastic, furniture, and related products. It also has strong development in the metal-civil, metallurgical, footwear, cereal, horticultural and temperate climate fruit sectors – as well as commerce and services.

4.2 Participants and survey

The survey was applied to 212 citizens during the period of social isolation caused by the Covid-19 pandemic (in the first quarter of 2021). To recruit participants, this study used the method of convenience sampling, which has been extensively used in social research. The questionnaire was applied in electronic form using the data collection tool Google Forms. Overall, 272 responses were received, and after cleaning and screening for missing data and outliers (Hair et al., 2014), 248 valid responses were obtained.



This sample includes 74.2% of women; with undergraduate and graduate levels, and the average income is the regional average. It is noteworthy that we have a young sample (respondents between 18 and 65 years old, and an average of 28 years old), which is probably a result of the type of data collection. Table 1 reports the descriptive statistics of the sample demographics.

Table 1 – Sample Profile

Age	Until 25 years old	50%
	26 to 41 years old	41.5%
	42 to 57 years old	7.3%
	More than 58 years old	1.2%
Gender	Male	25.8%
	Female	74.2%
	Prefer not to answer	0.0%
Marital Status	Married/ Stable Union	37.9%
	Divorced / Separated	4.0%
	Single	58.1%
Education Level	High school or elementary school	16.0%
	Bachelor's degree	64.2%
	Postgraduate (specialization or MBA level)	15.1%
	Postgraduate degree (at master's or doctoral level)	4.7%
Family Income	Up to 2 minimum wages	39.9%
	From 2 to 6 minimum wages	42.7%
	From 6 to 10 minimum wages	10.1%
	From 10 to 14 minimum wages	4.8%
	More than 14 minimum wages	2.4%
Ethnicity	White	78.2%
	Other	1.3%
	African - American	16.5%
	African	4.0%
Lives	In the countryside (inland)	8.0%
	In the urban area (downtown and neighborhoods)	92%

Source: Research Data / *Note: 1 minimum wage is BRL 1,100.00 (around USD 209.06)

4.3 Measures

The survey instrument for this study included measurement scales derived from the literature; using self-report measures based on multi-item scales. Urban planning (UP) is the independent variable and was derived from earlier studies conducted by Luz (1997). GNH is the dependent variable as was accessed by the GNHI (translated to Portuguese by Valentim et al., 2014). The items were measured on a 5-point scale, ranging from 1 (unsatisfied) to 5 (satisfied). Even though both questionnaires are validated before in literature, we asked two experts on the topic to read the questionnaire, and then, they evaluated whether the questions effectively capture the topic under investigation. The final questions are presented in supplementary documents.



4.4 Data analysis

The data collected were analyzed using SPSS Statistics 21. Initially, the preparation of the data entry matrix was conducted, where missing values, outliers, and the normality of data distribution were analyzed. After that, a descriptive analysis of the main dimensions (latent variables) was performed, presenting the measures of mean and standard deviation (SD). Finally, a bivariate analysis of the data was performed, to test the correlations between the variables, and a linear regression was conducted to understand the association between the constructs and test the main hypothesis.

5 RESULTS

First, we proceed with a descriptive analysis of the dimensions of urban planning perception (as presented in Table 2) and of happiness and well-being (Table 3). This step is important, once this observation is important in a way to know the main perception of the sample the evaluation of the living standards; education health; environment; community; vitality; time-use; psychological well-being; good governance; cultural resilience and promotion. These domains demonstrate that from the perspective of GNH, many inter-related factors are important in creating the conditions for happiness and well-being.

Table 2 – Analysis of Urban planning

Latent variable	Mean	SD	Reliability
Access and occupation	3.47	.565	.909
Housing	3.71	.802	
Urban planning	3.59	.577	

Source: Research data/ reliability measured by Cronbach's Alpha

Examining the results of Table 2, we have a medium-positive analysis of the urban planning in general (mean 3.59) and housing have the highest evaluation with 3.71 as mean. These are not exactly good averages, but it seems impacted by the sample expectations and profile.

Table 3 – Analysis of Gross National Happiness dimensions

Latent variable	Mean	SD	Reliability
Psychological Well-being	3.86	.681	.877
Health	2.84	.628	
Time Use	3.07	.662	
Education	2.98	1.087	
Cultural Diversity and Resilience	2.66	1.044	
Community Vitality	2.74	.644	
Good Governance	3.14	.616	
Ecological Diversity and Resilience	3.16	.829	
Living Standards	3.10	.741	
Happiness (GNH)	3.06	.468	

Source: Research data/ reliability measured by Cronbach's Alpha



Analyzing table 3, we can conclude that the sample showed only a positive average in psychological well-being (even this research was conducted during the Coronavirus pandemic), presenting 3.86 as average. On the other hand, we have that cultural diversity and resilience show a low average (2.66), as well as community vitality and health perception. In general, the sample has an intermediary index of happiness and well-being.

Also, we used a one-way analysis of variance (ANOVA) to determine whether there are any statistically significant differences between the means, comparing the GNH latent variables and the sample's main characteristics. We found a significant difference between psychological well-being and age, where the older the respondents, the greater their perception of psychological well-being. In terms of gender, we found a significant difference between time use, living standards, and happiness (GNH) - once women have lower levels than men.

Additionally, there is a significant difference between psychological well-being; health education; cultural diversity and resilience; living standards; happiness (GNH), and family income (see table 4).

Table 4 – Analysis one-way analysis of variance (ANOVA)

	Mean of Family Income (Minimum wages)					Sig.
	Up to 2	2-6	6-10	10-14	14+	
Psychological Well-being	3.69	3.92	4.27	4.15	3.75	.001
Health	2.92	2.74	2.78	2.82	3.69	.003
Time Use	3.06	3.06	2.98	2.93	3.70	.176
Education	2.82	2.59	3.04	2.83	3.77	.013
Cultural Diversity and Resilience	2.65	2.48	3.02	2.91	3.83	.006
Community Vitality	2.76	2.64	2.84	3.14	2.85	.088
Good Governance	3.07	3.16	3.28	3.25	3.10	.533
Ecological Diversity and Resilience	3.20	3.06	3.23	3.50	3.66	.256
Living Standards	2.90	3.09	3.55	3.62	3.91	.000
Happiness (GNH)	3.04	2.99	3.22	3.22	3.57	.008

Source: Research data

After this initial stage, a bivariate analysis was carried out, to verify whether there is any correlation (positive or negative) between the urban planning and the perception of happiness and well-being. The correlation analysis was performed using Pearson's linear correlation coefficient (Table 5).

Before evaluating the verified relationships, it is also necessary to present the meaning of Pearson's correlation coefficients (r). According to what was explained in Hair Jr. et al. (2005) is considered a: (1) very strong relationship when the variation is between 0.91 and 1.00; (2) high when the variation is between 0.71 and 0.90; (3) moderate when the variation is 0.41 and 0.70; (4) small but defined when it varies between 0.21 and 0.40; and (5) light, almost imperceptible when the variation is between 0.01 and 0.20.

Among the obtained relationships, it is worth highlighting the high relationship between the access and occupation, and housing in urban planning – as expected once those variables compose the construct of urban planning. Moreover, we found a small but defined and moderate relationship between all dimensions of urban planning and the dimensions of happiness and well-being - this being a requirement to proceed with the analysis of the associations between the variables.



Table 5 – Relationship between the dimensions

	Psycho-Wellb	Health	Time Use	Educat.	Cultur.	Comm. Vitality	Good Govern.	Ecolog. Divers.	Living Standar.	GNH	Access & occu.	Housing	Urban planni.
Psychological Well-being	1												
Health	.73	1											
Time Use	.227**	.454**	1										
Education	.146*	.171**	.238**	1									
Cultural Diversity and Resilience	.128*	.407**	.472**	.610**	1								
Community Vitality	.184**	.454**	.410**	.175**	.414**	1							
Good Governance	.89	.081	.122	.104*	.166**	.276**	1						
Ecological Diversity and Resilience	.98	.264**	.290**	.290**	.348**	.326**	.333**	1					
Living Standards	.177**	.303**	.319**	.213**	.414**	.357**	.131**	.344**	1				
Happiness (GNH)	.371**	.567**	.638**	.636**	.794*	.634**	.395**	.604**	.604**	1			
Access and occupation	.224**	.254**	.313**	.260**	.365**	.389**	.332**	.364**	.366**	.530**	1		
Housing	.200**	.241**	.255**	.059	.176**	.300**	.193**	.497**	.497**	.398**	.407**	1	
Urban planning	.249**	.292**	.331**	.168**	.301**	.399**	.297**	.407**	.525**	.536	.773**	.894**	1

Source: Research Data.

** The correlation is significant at the 0.01 level (2 ends) / * The correlation is significant at the 0.05 level (2 ends)

So, in the final analysis of the model (see Table 6), the effects of urban planning on happiness and well-being were assessed through linear regression.

Table 6 – Linear regression results

	R ² **	R ² -ajus	F Statistic	Beta	t	Sig
Urban Planning → Psychological Well-being	0.62	.058	16.197	.249	10.587	.000
Urban Planning → Health	.085	.082	22.950	.292	7.043	.000
Urban Planning → Time Use	.109	.106	30.177	.331	6.788	.000
Urban Planning → Education	.028	.024	7.169	.168	2.678	.000
Urban Planning → Cultural Diversity and Resilience	.091	.087	24.500	.301	4.950	.000
Urban Planning → Community Vitality	.159	.156	46.636	.399	6.829	.000
Urban Planning → Good Governance	.088	.084	23.730	.297	4.871	.000
Urban Planning → Ecological Diversity and Resilience	.165	.162	48.715	.407	6.980	.000
Urban Planning → Living Standards	.275	.272	93.435	.525	9.666	.000
Urban planning → Happiness (GNH)	.287	.285	99.263	.536	9.425	.000

Source: Research Data

** Cohen (1988, p. 413-414) proposed small, medium, and large magnitudes for R², and the values are 0.02, 0.13, and 0.26, respectively.

The linear regression showed that urban planning predicts happiness and well-being [$F(1,247)= 23.675, p < 0.001; R^2 0.285$]. So, the 1.500 points in better urban planning perception increase .536 points the sample's happiness.

More specifically, in terms of well-being, we have that all variables are important for the model; however, urban planning impacts more time use perception ($R^2 0.109$), community vitality ($R^2 0.159$), ecological diversity and resilience ($R^2 0.165$), and the most important, living standards ($R^2 0.272$). So, based on Cohen (1988) we have large coefficients of determination for (1) urban planning and education (where 28% of the dependent variable can be explained by the independent variable); urban planning and living standards (27.5%); and urban planning and GNH (28.7%).

6 DISCUSSION

Our results extend the literature in at least two ways. First, we endorse Musa et al. (2018) findings, by deducing that the level of community happiness depends on the existing level of sustainable urban development. Also, the results prove Musa et al. (2018) findings, especially that a good performance of eco-environmental well-being and human well-being moderate sustainability, and community happiness. That is, the level of community happiness depends on the existing level of sustainable urban development.

Second, it should be noted in our findings that the individual and psychological dimensions related to health, culture, and education, as well as good governance, are not impacted by urban planning in the same way (even though they are significant in the model). This result can be explained by Yang et al. (2015), once they infer that human well-being improvement and Sustainability is the ultimate goal of human development. Also, the achievement of SDGs depends on the ability



to monitor human well-being to track policy outcomes and the connection between ecosystem and human well-being (Musa et al., 2018; Turner et al., 2012; Yang et al., 2015).

In this sense, our findings can be used by urban planning governance to plan actions to promote health through sustainable urban development, as those proposed by Tonne et al. (2021) and Mouratidis (2021), once urban planners should look for improving subjective well-being in cities, like urban nature, communal spaces; social interaction between neighbors; facilities and services; active travel and public transport; technology and emerging mobility; upkeep and order; noise reduction; aesthetic quality; socio-spatial equity; and urban planning processes.

7 CONCLUSION

This study was designed to present how urban planning is associated with and explains psychological well-being, health, time use, education, cultural diversity and resilience, community vitality, good governance, ecological diversity, resilience, and lastly, living standards. We used Gross National Happiness Index (GNH) as theoretical background. Our results confirmed previous studies (e.g., Michael et al., 2014; Musa et al., 2018) regarding the relationship between happiness and well-being and urban planning.

However, by analyzing the results, we can observe that even though urban planning predicts happiness and well-being, we found that urban planning impacts more time use perception; community vitality; ecological diversity and resilience; and most important, living standards – which are explained by the pillars of sustainable socio-economic development and environmental conservation.

So, we concluded that urban planning impacts more on the variables that are directly related to the environment, explained by the pillars of sustainable socio-economic development and environmental conservation. The individual and psychological dimensions related to health, culture, and education show smaller impacts, as well as good governance.

In a practical approach, we concluded that the physical components of a city play an important role and need to be carefully designed that be both equitable and sustainable. This is because, urban planners and government should consider its undeniable impact on the mental health, happiness, and well-being of a city's residents.

8 RESEARCH LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

It is evident that, although the research has achieved its objective, some limitations should be listed, such as the number of respondents (which, although considered an adequate sample considering the software used) is still small. In addition, the sample has characteristics of a younger and single population - which may have changes in other groups.

Another important limitation may be inherent to the study. To operationalize both constructs (urban planning and happiness and well-being), we used objective measures to capture the perceptions of the sample. Other researchers use other measures, and by our choice, we may have a bias in our study, but we were aware of this limitation.

New studies should consider collecting data on urban planning (using the objective and subjective perspective) through consolidated data – which would require observational and applied studies, for example, making technical analyzes of urban planning.



In addition, longitudinal studies could be conducted to analyze the perception and change over time of a given sample, even considering situational changes in urban planning or individual indicators of respondents (relative to happiness and well-being).

Another limitation is the lack of a bibliography that addresses Gross National Happiness, as well as its association with urban planning. There was also difficulty in obtaining respondents for this research since, at the time of data collection, the COVID-19 pandemic is at its height (in Brazil). Even having waited for a reasonable time, hoping for an improvement in the situation, at a certain point it was necessary to finish the data collection. Another issue that deserves attention is the length of the questionnaire, which may have contributed to a lower adherence of respondents. Given these limitations, new studies may be conducted based on other realities, and other regions - to complement our findings.

Nevertheless, even with its limitations, there is a potential study to be used by government agencies to act directly in the elaboration of public policies, once it is understood that by using the GNH it is possible to identify specific deficits. Sociologists, psychologists, and economists through this social meter could bring an interpretation related to their area to assist in solving the problems faced.

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Contribution	[Author 1]	[Author 2]
1. Definition of research problem	V	V
2. Development of hypotheses or research questions (empirical studies)	V	V
3. Development of theoretical propositions (theoretical work)		V
4. Theoretical foundation / Literature review		V
5. Definition of methodological procedures		V
6. Data collection	V	V
7. Statistical analysis		V
8. Analysis and interpretation of data		V
9. Critical revision of the manuscript		V
10. Manuscript writing		V

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The authors have stated that there is no conflict of interest.

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