Camila Teixeira Vaz

A desordem física e sua influência nos desfechos relacionados à saúde em adultos e idosos residentes em centros urbanos: evidências de cinco países da América Latina

Universidade Federal de Minas Gerais
Programa de Pós-Graduação em Saúde Pública
Belo Horizonte
2019

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Tese apresentada ao Programa de Pós-Graduação em Saúde Pública da Faculdade de Medicina da Universidade Federal de Minas Gerais, como requisito parcial para obtenção do título de Doutor em Saúde Pública.

Área de concentração: Saúde Pública

Orientadora: Profª. Dra. Waleska Teixeira Caiaffa
Coorientadora: Profª. Dra. Amélia Augusta de Lima Friche

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A desordem do ambiente e sua influência nos desfechos relacionados à saúde em adultos e idosos residentes em centros urbanos: evidências de cinco países da América Latina

CAMILA TEIXEIRA VAZ

Tese submetida à Banca Examinadora designada pelo Colegiado do Programa de Pós-Graduação em SAÚDE PÚBLICA, como requisito para obtenção do grau de Doutor em SAÚDE PÚBLICA, área de concentração SAÚDE PÚBLICA.

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CAMILA TEIXEIRA VAZ

Realizou-se, no dia 23 de agosto de 2019, às 09:00 horas, Sala 526, Faculdade de Medicina. Av. Professor Alfredo Balena, 190. Santa Efigênia., da Universidade Federal de Minas Gerais, a defesa de tese, intitulada *A desordem do ambiente e sua influência nos desfechos relacionados à saúde em adultos e idosos residentes em centros urbanos: evidências de cinco países da América Latina*, apresentada por CAMILA TEIXEIRA VAZ, número de registro 2016653536, graduada no curso de FISIOTERAPIA, como requisito parcial para a obtenção do grau de Doutor em SAÚDE PÚBLICA, à seguinte Comissão Examinadora: Prof(a). Waleska Teixeira Caiaffa - Orientadora (UFMG), Prof(a). Amélia Augusta de Lima Friche - Coorientadora (UFMG), Prof(a). Sueli Aparecida Mingoti (UFMG), Prof(a). Vanessa Moraes Bezerra (UFBA), Prof(a). Letícia de Oliveira Cardoso (FIOCRUZ), Prof(a). Adriana Lúcia Meireles (UFOP).

A Comissão considerou a tese:

(X) Aprovada

( ) Reprovada

Finalizados os trabalhos, lavrei a presente ata que, lida e aprovada, vai assinada pelos membros da Comissão.
Belo Horizonte, 23 de agosto de 2019.

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Ao meu companheiro, Victor Augusto Silveira e Silva;
À todos os meus familiares, amigos e amigas.

Resumo

Introdução: A urbanização desigual, marcante nos países em desenvolvimento, e o rápido envelhecimento populacional podem afetar de forma danosa a satisfação com a vida e a autoavaliação de saúde em adultos e idosos. Assim, o papel do ambiente físico e social deve ser investigado, especialmente naqueles vivendo nas cidades da América Latina, onde urbanização e envelhecimento encontram-se muito acelerados. **Objetivos:** Investigar a associação entre a satisfação com a vida e as características individuais e medidas objetivas do ambiente construído, entre idosos residentes em Belo Horizonte, Brasil (Artigo 1), bem como investigar a associação entre a autoavaliação de saúde e as características percebidas da vizinhança, entre adultos residentes em quatro cidades da América Latina (Artigo 2). **Método:** Para contemplar o primeiro objetivo foram analisados dados do inquérito domiciliar "Saúde em Beagá" (2008-2009) e a caracterização objetiva do ambiente pelo método da observação social sistemática (OSS) (2011), ambos realizados nos Distritos Sanitários Oeste e Barreiro de Belo Horizonte - Brasil. O inquérito teve delineamento amostral probabilístico, estratificado, em conglomerados em três estágios (setor censitário, domicílio e um residente de 18 anos e mais). Foram entrevistados 4.048 indivíduos e para este estudo foram analisados os dados dos participantes de 60 anos ou mais (N=834). O desfecho satisfação com a vida foi avaliado por meio da Escala da Escada e categorizado em satisfeito e insatisfeito. As variáveis explicativas foram: demográficas e socioeconômicas, estilo de vida, participação religiosa, saúde e medidas objetivas do ambiente construído. Foram utilizados modelos multiníveis de regressão de Poisson, bivariados e multivariados, com variância de erro robusta, para investigar a associação entre a satisfação com a vida e as variáveis explicativas. Para contemplar o segundo objetivo foram analisados dados de inquérito domiciliar realizado pelo Banco de Desenvolvimento da América Latina (CAF), entre os anos de 2016 e 2017, em indivíduos de 20 a 60 anos (N=3.588), em quatro cidades da América Latina (Buenos Aires, Cidade do México, Cidade do Panamá e Lima). O desfecho autoavaliação de saúde foi categorizado em ruim e boa. As variáveis explicativas foram escalas de percepção do ambiente, medidas no nível da vizinhança. São elas: Desordem Física, Desordem Social, Acesso a Serviços, Acesso a Espaços de Lazer e Coesão Social, criadas usando estimativa bayesiana empírica. As covariáveis foram, no nível individual: idade, sexo, escolaridade, índice de riqueza (criado com variáveis de posse de bens de consumo, acesso a serviços básicos e características habitacionais), tempo de residência na respectiva vizinhança e cidade; e um "índice de ambiente social" no nível da vizinhança, criado com variáveis dos

censos demográficos harmonizadas. Foram utilizadas modelos de regressão logística multiníveis, em dois níveis (individual e vizinhança). **Resultados:** O Artigo 1 mostrou maior prevalência de satisfação com a vida em idosos com maior renda, maior participação religiosa, praticantes de atividade física e cuja autopercepção de saúde era boa/muito boa. Ademais, foi observado menor prevalência de satisfação com a vida entre aqueles que moravam em vizinhança com maior desordem física, mesmo após ajustes para características individuais e outras características contextuais. Os resultados do Artigo 2 mostraram que a autoavaliação de saúde ruim esteve positivamente associada à desordem física, mesmo após ajustes para características individuais e contextuais. **Conclusão:** Intervenções e estratégias que melhorem as características do ambiente físico no qual os indivíduos vivem podem melhorar a satisfação com a vida e a autoavaliação de saúde de adultos e idosos que residem nas cidades.

Palavras-chave: Satisfação com a Vida; Autoavaliação de Saúde; Saúde Urbana; Ambiente Social; Ambiente Construído; Meio Ambiente; Análise Multinível.

Abstract

Introduction: Unequal urbanization, striking in developing countries, and the rapid population aging can adversely affect life satisfaction and self-rated health among adults and old people. The role of the physical and social environment that may be related to these outcomes should be investigated, especially among individuals living in Latin American cities, where urbanization and aging have been so fast. **Objectives:** To investigate the association between life satisfaction, individual characteristics and objective measures of the built environment, among old people living in Belo Horizonte, Brazil (Paper 1), as well as to investigate the association between self-rated health and perceived neighborhood characteristics among adults living in four Latin American cities (Paper 2). **Method:** In order to reach the first objective data from the household survey "*Saúde em Beagá*" (2008-2009) and the objective characterization of the environment by the systematic social observation method (SSO) (2011), carried out in two of the nine Sanitary Districts of Belo Horizonte - Brazil, were used. The survey had a stratified probabilistic sampling design in three-stage conglomerates (census tract, household and a resident of 18 years and over). A total of 4,048 individuals were interviewed and data from participants aged 60 and over were analyzed for this study (n=834). Life satisfaction was assessed by the Ladder Scale and categorized as satisfied and dissatisfied. The explanatory variables were: demographic and socioeconomic, lifestyle, religious participation, health, and objective measures of the built environment. Multilevel Poisson regressions analyses, in the bivariate and multivariate models, with robust variance were used to investigate the association between life satisfaction and explanatory variables. In order to reach the second objective data from a household survey conducted by the Latin American Development Bank (CAF) between 2016 and 2017, among individuals between 20 and 60 years old (N=3,588), in four Latin American cities (Buenos Aires, Lima, Mexico City and Panama City) were analyzed. Self-rated health was categorized as poor and good. Explanatory variables were neighborhood scales: Physical Disorder, Social Disorder, Access to Services, Access to Leisure Spaces, and Social Cohesion, created using empirical Bayesian estimation. The covariates were: individual age, gender, education, wealth index (created with variables of ownership of consumer goods, access to basic services and housing characteristics), length of residency in the respective neighborhood and city; and a neighborhood social environment index, created with harmonized census variables. Multilevel logistic regressions with two levels (individual and “sub-city”) were used. **Results:** Results from Article 1 showed a higher prevalence of life satisfaction in elderly people with higher

incomes, higher religious participation, who practiced physical activity and who had good/very good self-rated health. In addition, a lower prevalence of life satisfaction was observed among those living in neighborhood with higher physical disorder, even after adjusting for individual and other contextual characteristics. Findings from Article 2 showed that poor self-rated health was positively associated with Physical Disorder, even after controlling for individual and contextual-level characteristics. **Conclusions:** Interventions and strategies that improve the characteristics of the physical and social environment in which individuals live can improve life satisfaction and self-rated health among adults and the elderly people living in cities from Latin America.

Key words: Life Satisfaction; Self-rated Health; Urban Health; Social Environment; Built Environment; Environment; Multilevel Analysis.

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AIC – Akaike Information Criterion

ARG – Argentina

BOL – Bolívia

BRA – Brasil

CAF – Banco de Desenvolvimento da América Latina

CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico

COL – Colômbia

ECU – Equador

ETIC – Comissão de Ética

ICC – Intra-neighborhood correlation coefficients

IVS – Índice de Vulnerabilidade à Saúde

m – Mean

MEX – México

mw – Minimum wages

No – Number

OR – Odds Ratio

OSS – Observação Social Sistemática

OSUBH – Observatório de Saúde Urbana de Belo Horizonte

PAN – Panamá

PER – Peru

PR – Prevalence Ratio

RED – Relatório sobre Economia e Desenvolvimento

SALS – Self-Anchoring Ladder Scale

SALURBAL – Salud Urbana en América Latina

SD – Standard deviation

SSO – Systematic social observation

TV – Television

UFMG – Universidade Federal de Minas Gerais

UNDP – UN Development Programme

URY – Uruguay

VEN – Venezuela

95% CI – 95% confidence interval

Sumário

1 Apresentação

Este documento trata do trabalho apresentado para a defesa da tese, como requisito parcial para obtenção do título de Doutor, no Programa de Pós-Graduação em Saúde Pública da Faculdade de Medicina da Universidade Federal de Minas Gerais.

Ele se insere na linha de pesquisa em Saúde Urbana e utiliza dados de um estudo epidemiológico multi-métodos, composto pelo inquérito domiciliar denominado *"Saúde em Beagá"*[1] e pela Observação Social Sistemática (OSS). O primeiro foi delineado a partir do referencial teórico de Saúde Urbana, proposto por Caiaffa e colaboradores em 2008[2]. Este modelo considera que características sociais e físicas definem o contexto urbano e são modulados por fatores proximais e distais, operando em múltiplos níveis[3]. Ademais, essa tese também utiliza dados de um inquérito domiciliar realizado pelo Banco de Desenvolvimento da América Latina (CAF Survey) e dados dos censos demográficos de quatro países da América Latina. Estes dados foram harmonizados pela equipe de pesquisadores do Projeto *Salud Urbana en América Latina* (SALURBAL).

Este trabalho apresenta os resultados de dois estudos. O primeiro investigou a associação entre a satisfação com a vida e as características individuais e medidas objetivas do ambiente construído, entre idosos residentes em Belo Horizonte, Brasil (Artigo 1); o segundo teve como objetivo investigar a associação entre a autoavaliação de saúde e as características percebidas da vizinhança, entre adultos residentes em quatro cidades da América Latina (Artigo 2). Este último foi desenvolvido durante o período em que a aluna esteve na *Drexel University*, Philadelphia, Estados Unidos, como bolsista do programa de doutorado sanduíche da Coordenação de Aperfeiçoamento de Pessoal do Ensino Superior, em 2018/2019. O volume está organizado da seguinte maneira:

- Introdução
- Justificativa
- Objetivos
- Métodos
- Artigo 1

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[1] FRICHE, A. A. L.; XAVIER, C. C.; PROIETTI, F. A.; CAIAFFA, W. T., organizadores. *Saúde Urbana em Belo Horizonte*. Belo Horizonte: Editora UFMG; 2015.

[2] CAIAFFA, W. T. et al. A. Saúde urbana: "a cidade é uma estranha senhora, que hoje sorri e amanhã te devora". *Ciência & Saúde Coletiva*, v. 13, n. 6, p. 1785-96, 2008.

[3] CAIAFFA, W. T.; FRICHE, A. A.; DANIELLE, C. Urban health: landmarks, dilemmas, prospects, and challenges. *Cadernos de saude publica*, v. 31, Suppl. 1, p. 5-6, 2015.

- Artigo 2
- Considerações finais
- Referências Bibliográficas (as referências bibliográficas das seções apresentação, introdução, justificativa e método são apresentadas em notas de rodapé, enquanto as respectivas referências de cada artigo original são apresentadas ao final do mesmo)
- Anexos e apêndices.

2 Introdução

O viver nas cidades representa uma realidade mundial[2], particularmente na América Latina e Caribe, consideradas as regiões mais urbanizadas do mundo, com quase 80% das pessoas vivendo em centros urbanos[4]. No Brasil, segundo o censo de 2010, 84% da população brasileira vive em cidades[5]. A urbanização desempenha um importante papel na vida dos indivíduos. De maneira geral, o desenvolvimento econômico e global nas cidades pode representar oportunidades positivas, como melhor acesso a serviços e melhor infraestrutura. Por outro lado, esse processo pode ser nocivo, gerando impactos desfavoráveis relacionados, por exemplo, à falta de organização social, baixa governança, precárias condições de moradia e trabalho[2].

Estes impactos negativos podem ser agravados pelo processo de urbanização acelerado, marcante nos países em desenvolvimento, resultando em uma infraestrutura insuficiente, deterioração do meio ambiente, formação de favelas e assentamentos informais e, sobretudo, uma profunda desigualdade social[4,6,7]. Um dado que merece destaque é que, de acordo com o *UN Development Programme* (UNDP), a América Latina é a região com a maior desigualdade socioeconômica do mundo[8]. Outro ponto que acentua os impactos negativos da urbanização é a celeridade do envelhecimento populacional, uma vez que, em todo o mundo, a proporção de pessoas com 60 anos ou mais está crescendo rapidamente. Até 2050 haverá dois bilhões de idosos no mundo, sendo 80% nos países em desenvolvimento[9]. Para esse período estima-se, ainda, que sete em cada 10 pessoas viverão em cidades e os idosos representarão 25% de toda essa população[10,11]. No Brasil, não é diferente. Idosos correspondem a 13,2% da população e a maior parte deles vive em áreas urbanas[5,12].

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[4] UN-HABITAT. *Estado de las ciudades de América Latina y el Caribe 2012: Rumbo a una nueva transición urbana*. ONU-Habitat, Agosto de 2012.

[5] INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA - IBGE. *Sinopse do Censo Demográfico 2010*. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2011. Disponível em: http://biblioteca.ibge.gov.br/visualizacao/livros/liv49230.pdf. Acesso em 12/10/2018.

[6] VLAHOV, D. et al. Urban as a determinant of health. *Journal of Urban Health*, v. 84, n. 3, suppl. 1, p. 16-26, 2007.

[7] UN-HABITAT. *The challenge of slums: global report on human settlements*, 2003 / United Nations Human Settlements Programme. ONU-Habitat, Nairobi, 2003.

[8] UN Development Programme (UNDP). Regional Human Development Report for Latin America and the Caribbean 2010 - Acting on the future: breaking the intergenerational transmission of inequality, November 2010. Disponível em: https://www.refworld.org/docid/4e7b52542.html. Acesso em 30/07/2019.

[9] ORGANIZAÇÃO MUNDIAL DE SAÚDE - OMS. *Active ageing: a policy framework*. Geneva: Organização Mundial de Saúde, 2002. Disponível em: http://whqlibdoc. Acesso em 12/10/2018.

[10] ORGANIZAÇÃO MUNDIAL DE SAÚDE - OMS. *Global age-friendly cities: a guide*. Geneva: Organização Mundial de Saúde, 2007. Disponível em:

Os idosos correspondem a uma parte da população em que o processo de urbanização exerce uma forte influência, pois o envelhecimento, normal ou acompanhado de doenças, podem tornar o idoso mais vulnerável aos efeitos dos impactos negativos deste processo[13]. Ademais, é importante destacar que para as pessoas idosas o local de moradia tem uma importância fundamental, uma vez que com o passar dos anos o diâmetro de espaço de vida desses indivíduos tende a diminuir. Enquanto adultos jovens podem estar expostos a diferentes contextos, incluindo trabalho, recreação e utilização de serviços em diversas áreas da cidade, os idosos, em sua maioria, têm em sua vizinhança seu principal ou único diâmetro de espaço de vida[13].

Em seu modelo causal dos efeitos da vizinhança no envelhecimento, Glass & Balfour indicam alguns domínios relacionados com o local de moradia que podem influenciar o resultado final (saúde e/ou desfechos relacionados à saúde) da interação do indivíduo com o ambiente. São eles: condições socioeconômicas; integração social da vizinhança, que envolve questões como o capital social, o medo, o crime e concentração de idosos; aspectos físicos da vizinhança como condições de calçadas e ruas, conservação das casas, tráfego; serviços e recursos como centros de saúde e hospitais, transporte, lojas, locais para lazer[13]. Desta forma, alterações associadas ao envelhecimento normal ou com a presença de doenças podem tornar os idosos mais vulneráveis à deterioração do ambiente físico e social, gerando impactos negativos na saúde e nos desfechos relacionados à saúde[13].

Assim, a urbanização desigual e o rápido envelhecimento populacional podem afetar de forma danosa a saúde, os modos de vida e os eventos relacionados à saúde, comprometendo o bem-estar da população. Dentre esses desfechos destacam-se a satisfação com a vida e a autoavaliação de saúde, que têm sido amplamente investigados por pesquisadores em todo o mundo e são considerados importantes preditores de mortalidade

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http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf. Acesso em: 12/10/2018.

[11] ORGANIZAÇÃO MUNDIAL DE SAÚDE - OMS. *Hidden cities: unmasking and overcoming health inequities in urban settings*. Kobe: Organização Mundial de Saúde, 2010. Disponível em: http://www.who.int/kobe_centre/publications/hiddencities_media/who_un_habitat_hidden_cities_web.pdf. Acesso em 12/10/2018.

[12] BRASIL. PNS 2013 - *Pesquisa Nacional em Saúde*. In.: IBGE. Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde, 2013. Disponível em: http://saladeimprensa.ibge.gov.br/noticias?view=noticia&id=1&busca=1&idnoticia=2965. Acesso em: 12/10/2018.

[13] GLASS, T. A.; BALFOUR, J. L. Neigborhood, aging and functional limitations. In: KAWACHI, I.; BERKMAN, L. F. Neighborhoods and health. New York: Oxford University Press; 2003. p.303-335

entre os indivíduos, especialmente em idosos[14,15]. Ademais, a literatura aponta que, para além das características individuais, a satisfação com a vida e autoavaliação de saúde podem ser modulados pelo ambiente físico e social[2,16,17].

Nessa perspectiva, a presente tese tem como objetivos investigar a associação entre a satisfação com a vida e as características individuais e medidas objetivas do ambiente construído, entre idosos residentes em Belo Horizonte, Brasil; bem como investigar a associação entre a autoavaliação de saúde e as características percebidas da vizinhança, entre adultos residentes em quatro cidades da América Latina. Os resultados da tese serão apresentados em forma de dois artigos científicos, conforme regulamento do programa de pós-graduação, e ambos fazem parte deste volume: o artigo 1, intitulado "*A multilevel model of life satisfaction among old people: individual characteristics and neighborhood physical disorder*", foi publicado na Revista *BMC Public Health* em julho de 2019 (ANEXO 1); o artigo 2, intitulado "*Physical disorder and poor self-rated health in adults living in four Latin American cities: a multilevel approach*", será objeto de avaliação para a defesa da tese como requisito parcial para obtenção do título de Doutor em Saúde Pública.

No entanto, antes de apresentá-los, faz-se necessário realizar uma breve contextualização sobre os desfechos em saúde estudados: satisfação com a vida e autoavaliação de saúde, bem como a proposição do modelo conceitual.

2.1 Satisfação com a vida

A satisfação com a vida é cada vez mais reconhecida como uma dimensão importante do bem-estar e é considerada a forma mais explícita pela qual as pessoas avaliam múltiplos aspectos de suas vidas cotidianas, que pode incluir avaliações do trabalho, de relacionamentos interpessoais ou outras de áreas da vida[18,19]. Ademais, ela pode ser descrita como um produto da interação entre a consciência humana e o ambiente físico e social no qual o indivíduo está

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[14] KOIVUMAA-HONKANEN, H.; HONKANEN, R.; VIINAMÄKI, H.; HEIKKILÄ, K.; KAPRIO, J.; KOSKENVUO, M. Self-reported life satisfaction and 20-year mortality in healthy Finnish adults. *American Journal of Epidemiology*, v. 152, n. 10, p. 983-991, 2000.

[15] GUIMARÃES, J. M. N. et al. Association between self-rated health and mortality: 10 years follow-up to the Pró-Saúde cohort study. *BMC Public Health*, v. 12, p. 676, 2012.

[16] BAUMAN, A. E. et al. Correlates of physical activity: why are some people physically active and others not? *Lancet*, v. 380, n. 9838, p. 258-271, 2012.

[17] DIEZ ROUX, A. V.; MAIR, C. Neighborhoods and health. *Ann N Y Acad Sci*, v. 1186, p. 125-145, 2010.

[18] STIGLITZ, J. E.; SEN, A.; FITOUSSI, J. P. Report by the Commission on the Measurement of Economic Performance and Social Progress. The New Press, Paris, 2009.

[19] DIENER, E.; BISWAS-DIENER, R. *Happiness: unlocking the mysteries of psychological wealth*. Malden, MA: Blackwell Publishing; 2008.

inserido[20]. Pesquisadores da área sugerem que a satisfação com a vida é um bem social e público e não apenas uma preocupação particular ou individual[21]. Portanto, discussões em torno desse aspecto oferecem um "poderoso convite para discutir e avaliar a forma como a sociedade facilita ou inibe o gozo de boas vidas", tornando-se o foco de um intenso debate nas políticas públicas e econômicas[22,23]. Desse modo, muitos países, em todo o mundo, estão avaliando a satisfação com vida, pois a sua melhoria está emergindo como uma aspiração social essencial para a população e ganhando força na área da Saúde Pública[24].

A satisfação com a vida está intimamente relacionada com a saúde e, como dito anteriormente, tem se tornado um importante preditor de morbidade e mortalidade ao longo do curso de vida do indivíduo[23,25,26]. Esta conexão entre os eventos relacionados à saúde e satisfação com a vida tem se tornado ainda mais importante entre os idosos, porque este período da vida é, frequentemente, acompanhado da presença de doenças e/ou disfunções e de uma maior necessidade de cuidados e suporte[27,28]. Ademais, a satisfação com a vida é considerada um componente essencial para o envelhecimento bem-sucedido e há um esforço constante entre pesquisadores de todo o mundo para se identificar os fatores associados que podem ajudar os indivíduos a alcançarem esse modelo ideal de envelhecimento[29].

Alguns estudos identificaram fatores individuais associados à satisfação com a vida, como fatores demográficos e socioeconômicos, a saúde física e mental, estilo de vida e atividades e interações sociais em adolescentes[30,31], adultos[32,33] e também em idosos[23,34,35].

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[20] GATAŪLINAS, A.; BANCEVIČA, M. Subjective Health and Subjective Well-Being (The Case of EU Countries). *Advances in Applied Sociology*, v. 4, n. 9, p. 212-223, 2014.
[21] LARSON, L. R.; JENNINGS, V.; CLOUTIER, S. A. Public Parks and Wellbeing in Urban Areas of the United States. *PLoS One*, v. 11, n. 4, p. e0153211, 2016.
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[26] KOIVUMAA-HONKANEN, H. T. *Life satisfaction as a health predictor*. Kupio University Printing Office, 1998.
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[30] LOOZE, M. E. et al. The Happiest Kids on Earth. Gender Equality and Adolescent Life Satisfaction in Europe and North America. *J Youth Adolesc*, v. 47, n. 5, p. 1073-1085, 2018.
[31] NEWLAND, L. A. et al. Multilevel Analysis of Child and Adolescent Subjective Well-Being Across 14 Countries: Child- and Country-Level Predictors. *Child Dev*, doi:10.1111/cdev.13134, 2018.
[32] KAHNEMAN, D.; DEATON, A. High income improves evaluation of life but not emotional well-being. *PNAS*, v. 107, n. 38, p. 16489-93, 2010.

2.2 Autoavaliação de saúde

Em todo o mundo, há anos, a saúde tem sido objeto de estudo de vários pesquisadores. No entanto, o conceito de saúde é complexo, não apresentando o mesmo significado para todas as pessoas, pois reflete, além de questões individuais como sociais, econômicas, físicas, mentais e culturais, as questões contextuais[36,37,38].

Portanto, medir a "saúde" da população de forma mais global continua sendo um desafio para pesquisadores e depende da ótica das informações consideradas[39]. Essa mensuração pode ser desenvolvida por meio de três distintas formas: i) informações médicas; ii) baseadas em sinais e sintomas patológicos e em exames diagnósticos; ou iii) avaliações feitas pelos próprios indivíduos, como a autoavaliação de saúde[40].

O interesse em medir a "saúde" por meio da autoavaliação de saúde é crescente, pois esta medida considera aspectos objetivos e subjetivos dos indivíduos. Ademais, considera uma ótica multidimensional, frente aos diferentes entendimentos da saúde, dentro do contexto cultural e psicossocial em que o sujeito está inserido[41]. Desta forma, o uso desta medida tem se ampliado nas últimas décadas, pois é considerado de fácil entendimento e engloba várias dimensões desse constructo para caracterizar o estado de saúde das populações[42].

A autoavaliação de saúde é um indicador recomendado pela Organização Mundial da Saúde para verificar a saúde das populações e, portanto, tem recebido atenção crescente na literatura nacional e internacional, uma vez que está relacionada ao bem-estar e à satisfação

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[33] NGAMABA, K. H. Determinants of subjective well-being in representative samples of nations. *Eur J Public Health*, v. 27, n. 2, p. 377-382, 2017.
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[39] MEIRELLES, A. L. *Autoavaliação da saúde em adolescentes e adultos: Estudo Saúde em Beagá*. Tese (Doutorado em Saúde Pública) - Faculdade de Medicina, Universidade Federal de Minas Gerais. Belo Horizonte, 2014.
[40] PAVÃO, A. L. B.; WERNECK, G. L.; CAMPOS, M. R. Autoavaliação do estado de saúde e a associação com fatores sociodemográficos, hábitos de vida e morbidade na população: um inquérito nacional. *Cad Saúde Pública*, v. 29, n. 4, p. 723-34, 2013.
[41] BEZERRA, P. C. L. et al. Percepção de saúde e fatores associados em adultos: inquérito populacional em Rio Branco, Acre, Brasil, 2007-2008. *Cad. Saúde Pública*, v. 27, n. 12, p. 2441-2451, 2011.
[42] THEME FILHA, M. M.; SZWARCWALD, C. L.; SOUZA JUNIOR, P. R. B. Medidas de morbidade referida e interrelações com dimensões de saúde. *Rev Saúde Pública*, v. 42, n. 1, p. 73-81, 2008.

com a vida da população[39,43]. Ademais, a autoavaliação de saúde, assim como a satisfação com a vida, é um forte preditor de morbidade e mortalidade, quase sempre excedendo os poderes preditivos de outros fatores médicos mais objetivos, e essa relação se mantém mesmo após controlar por fatores sociodemográficos, físicos e de estilo de vida[15,44,45]. Além de ser uma valiosa fonte de dados sobre a saúde da população, ela é uma medida de saúde válida, confiável, simples, barata e de fácil administração em inquéritos de saúde entre diferentes populações[46,47,48].

Os fatores individuais que podem estar associados à autoavaliação de saúde têm sido extensivamente investigados[39]. As evidencias científicas sugerem que fatores demográficos e socioeconômicos, a saúde física e mental, estilo de vida e o capital social estão relacionados a este constructo[48,49,50,51,52].

2.3 Satisfação com a vida e autoavaliação de saúde e suas relações com os fatores contextuais

Como já mencionado, a urbanização, antes esperada produzir somente efeitos benéficos, conhecida como as "vantagens urbanas", pode acarretar danos sociais, econômicos e ambientais de grande impacto, difíceis de mensurar completamente nos dias atuais. Isso quer dizer que os atributos físicos e sociais (contexto), ou seja, o ambiente físico e social, da cidade e seus bairros e/ou vizinhanças podem afetar a saúde dos indivíduos. O ambiente físico refere-se às características naturais do ambiente (áreas verdes, declives do solo, temperatura e clima)

[43] PAGOTTO, V.; BACHION, M. M.; SILVEIRA, E. A. Autoavaliação da saúde por idosos brasileiros: revisão sistemática da literatura. *Revista Panamericana de Salud Pública*, v. 33, n. 4, p. 302-310, 2013.
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[47] BARROS, M. B. A. et al. Auto-avaliação da saúde e fatores associados, Brasil, 2006. *Rev Saúde Pública*, v. 43, Suppl. 2, p. 27-37, 2009.
[48] BORIM, F. S. A.; BARROS, M. B. A.; NERI, A. L. Autoavaliação da saúde em idosos: pesquisa de base populacional no Município de Campinas, São Paulo, Brasil. *Cad Saúde Pública*, v. 28, n. 4, p. 769-80, 2012.
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[52] PERES, M. A. et al. Auto-avaliação da saúde em adultos no Sul do Brasil. *Rev Saúde Pública*, v. 44, n. 5, p. 901-11, 2010.

e às estruturas construídas (ruas e suas conexões, presença de calçadas, semáforos, sinalização das ruas, comércio, serviços de saúde, academias, praças, áreas de lazer, transporte público, padrões estéticos)[2,17]. O ambiente social inclui as diferentes características relacionadas às condições de vida das pessoas, como as relações interpessoais (suporte social e rede social), as características comunitárias (coesão social e capital social) e as iniquidades sociais (posição socioeconômica, iniquidade de renda e discriminação racial)[2,17].

Desta forma, a ocorrência dos eventos relacionados à saúde, numa visão mais abrangente, estaria associada a atributos dos indivíduos aninhados no "lugar urbano"[2]. Nos últimos anos, tem-se observado um aumento no interesse de pesquisadores, em todo o mundo, de se investigar como a vizinhança e os fatores contextuais afetam a saúde dos residentes[53,54,55]. Esse maior interesse deve-se ao fato de: a) explicações puramente individuais das causas de problemas de saúde são insuficientes e não conseguem capturar importantes determinantes de doenças; b) maior necessidade de entendimento sobre as causas das iniquidades sociais e diferenças raciais/étnicas na saúde, pois o local de residência é fortemente determinado pela posição social e pela etnia e, portanto, as características da vizinhança podem ser importantes causadoras das iniquidades em saúde; c) esforços na promoção de saúde e prevenção de doenças precisam considerar os efeitos na saúde de políticas que não são, tradicionalmente, consideradas políticas de saúde, mas que podem ter implicações importantes para a saúde; e, finalmente, d) maior disponibilidade e popularidade de métodos mais adequados ao estudo dos efeitos da vizinhança sobre a saúde, como análise multinível, Sistemas de Informação Geográfica e técnicas de análise espacial[17].

Medir as características física e social em uma vizinhança constitui um dos maiores desafios conceitual, metodológico e operacional para a incorporação deste tipo de informação nas pesquisas sobre o tema, atualmente[2]. Uma opção é a inclusão da percepção do indivíduo acerca de sua vizinhança, que tem como vantagem a informação peculiar de aspectos da organização e estrutura do bairro/vizinhança, e como desvantagem o fato de que sua percepção estará sempre permeada por valores, experiências e papel social dentro de uma dada comunidade, introduzindo importante fonte de bias[2]. Uma alternativa tem sido a inclusão de medidas resultantes de observação direta das condições físicas e interações sociais de um bairro/vizinhança, a Observação Social Sistemática[2]. Essa abordagem permite a obtenção de

[53] MACINTYRE, S.; ELLAWAY, A. CUMMINS, S. Place effects on health: how can we conceptualise, operationalise and measure them? *Soc Sci Med*, v. 55, n. 1, p. 125-139, 2002.
[54] DIEZ ROUX, A. V. Neighborhoods and health: where are we and were do we go from here? *Rev Epidemiol Sante Publique*, v. 55, n. 1, p.13-21, 2007.
[55] O'CAMPO, P. Invited commentary advancing theory and methods for multilevel models of residential neighborhoods and health. *Am J Epidemiol*, v. 157, n. 1, p. 9-13, 2003.

informações e medidas que independem da percepção individual e que eventualmente a complementam e tem como vantagens a cobertura de maiores áreas e a observação do comportamento e do ambiente num mesmo momento[2].

Assim, usando ambas as formas de se medir as características do ambiente físico e social, muitos estudos têm sido desenvolvidos com o objetivo de se investigar, especificamente, como a vizinhança e os fatores contextuais afetam a saúde e o bem-estar dos indivíduos, bem como os eventos relacionados à saúde, como a satisfação com a vida e a autoavaliação de saúde. A evidência científica tem apontado piores resultados na satisfação com a vida e na autoavaliação de saúde em áreas com uma alta iniquidade quando comparadas com outras áreas, no mesmo ambiente urbano, com baixa iniquidade[56,57,58,59,60,61]. Tais resultados estão relacionados, além dos fatores individuais, à exposição a água não tratada, às condições sanitárias inadequadas, às condições habitacionais inapropriadas e à falta de acesso a serviços de saúde e escolas[60,62,63]. Outros fatores que impactam negativamente a satisfação com a vida e a autoavaliação de saúde são a falta de transporte, a falta de acesso a espaços de laser, exposição ao crime e à violência, além do estresse criado por viver com medo constante devido à insegurança, criando altos níveis de desconfiança e minando o capital social[60,61,62].

2.4 Modelo conceitual

Nos últimos anos, os modelos ecológicos têm ganhado destaque e ressaltam que o processo saúde-doença, bem como uma satisfação com a vida e uma boa autoavaliação de saúde envolvem um processo complexo que resulta da relação entre atributos individuais e do grupo ou população em que os indivíduos estão aninhados[2].

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[56] HART, E. A. C. et al. Contextual correlates of happiness in European adults. *PLoS ONE*, v. 13, n. 1, p. e0190387, 2018.
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[58] MEIRELES, A. L. et al. Autoavaliação da saúde em adultos urbanos, percepção do ambiente físico e social e relato de comorbidades: Estudo Saúde em Beagá. *Cad Saúde Pública*, v. 31, Supl. 1, p. 120-135, 2015.
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[60] HOWDEN-CHAPMAN, P. et al. Effect of insulating existing houses on health inequality: cluster randomised study in the community. *BMJ*, v. 334, n. 7591, p. 460, 2007.
[61] GALEA, S. et al. Urban built environment and depression: a multilevel analysis. *J Epidemiol Community Health*, v. 59, p. 822-827, 2005.
[62] WORLD HEALTH ORGANIZATION. *Our cities, our health, our future: acting on social determinants for health equity in urban settings*. Report of the Knowledge Network on Urban Settings to the WHO Commission on Social Determinants of Health. Kobe: WHO Centre for Health Development, 2007.
[63] WILNER, D. M. et al. Housing as an environmental factor in mental health: the Johns Hopkins Longitudinal Study. *Am J Public Health*, v. 50, n. 1, p. 55-63, 1960.

Nessa perspectiva, propomos um modelo conceitual que pode explicar como as características individuais e do ambiente, nos diferentes níveis hierárquicos, podem influenciar a satisfação com vida e a autoavaliação de saúde (Figura 1). Neste modelo, tendências globais, como agendas mundiais, determinam a sociedade civil e suas normas sócioculturais que, consequentemente, determinam o desenvolvimento econômico e, por sua vez, determinam o planejamento urbano e políticas públicas de governos nacionais e locais. Essas tendências globais podem levar a uma segregação residencial devido à posição socioeconômica, gerando iniquidades nas distribuições de recursos e vice e versa. A segregação residencial e as iniquidades na distribuição dos recursos podem definir o local de moradia dos indivíduos, como exemplo, indivíduos mais desfavorecidos moram em vizinhanças mais deterioradas. O ambiente físico e social, por sua vez, influencia os fatores individuais e estes a satisfação com a vida e a autoavaliação da saúde. Ou seja, esses dois desfechos relacionados à saúde são influenciados por fatores em múltiplos níveis.

Considera-se que o ambiente social e físico/construído é passível de intervenção, de modo que mudanças no ambiente podem ser determinantes para favorecer uma satisfação com a vida e uma boa autoavaliação de saúde.

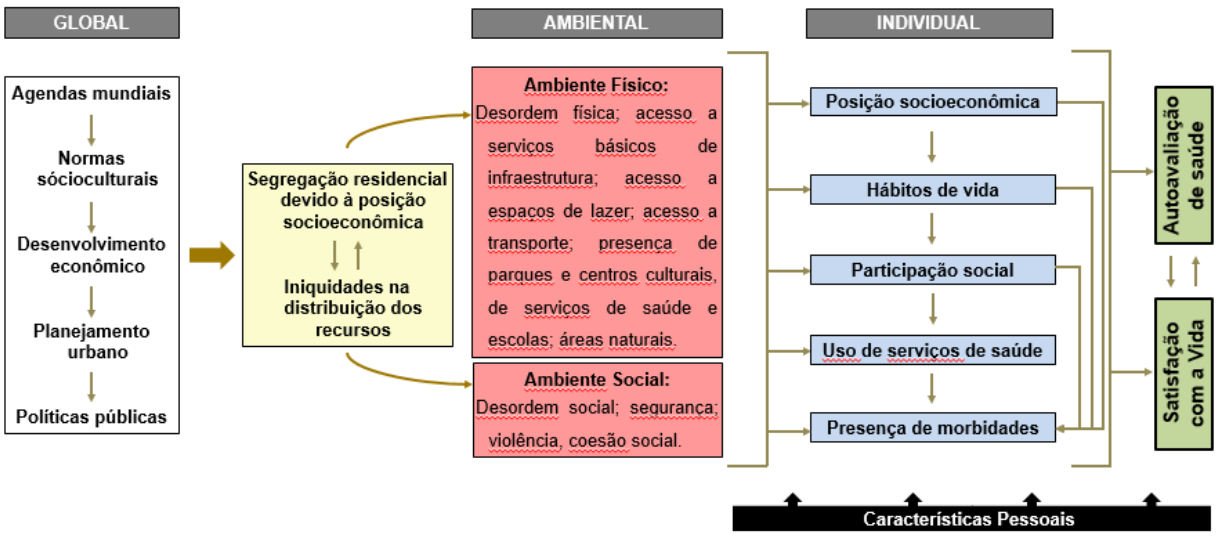

Figura 1: Modelo conceitual dos fatores individuais e de contexto associados à satisfação com a vida e à autoavaliação de saúde.

3 Justificativa

Apesar da importância do tema, a maioria das pesquisas que investigaram a satisfação com a vida, a autoavaliação de saúde e a vizinhança basearam-se em amostras relativamente pequenas, com baixas taxas de resposta, e com abordagens analíticas não adequadas para investigar a influencia do contexto sobre esses desfechos, além de serem consideradas heterogênias[64], limitando a validade externa. Ademais, este impacto não tem sido amplamente explorado nas cidades da America Latina, região em que, como dito anteriormente, quase 80% das pessoas vivem em cidades. Além disso, as características do ambiente são especialmente importantes no contexto da América Latina, pois esta é uma região na qual, devido à urbanização acelerada, há uma deterioração do ambiente, com infraestrutura básica insuficiente, sendo considerada a região com maior desigualdade socioeconômica do mundo, já mencionado. Neste cenário, compreender, quantificar e gerenciar as variáveis do ambiente físico e social que influenciam a satisfação com a vida e a autoavaliação de saúde na população adulta e idosa, em países da América Latina, torna-se um grande desafio no movimento para construir cidades sustentáveis e saudáveis para esses grupos[10,11,12].

[64] GOMEZ, L. F.; SOTO-SALAZAR, C.; GUERRERO, J.; GARCIA, M.; PARRA, D. C. Neighborhood environment, self-rated health and quality of life in Latin America. *Health Promot Int*, Feb 11, 2019. [Epub ahead of print].

4 Objetivos

4.1 Objetivo Geral

Investigar a associação entre o ambiente físico e social com a satisfação com a vida e com a autoavaliação de saúde, em indivíduos residentes em centros urbanos de cinco países da América Latina.

4.2 Objetivos Específicos

1. Investigar a associação entre a satisfação com a vida, as características individuais e medidas objetivas do ambiente construído, entre idosos residentes em Belo Horizonte, Brasil (**Artigo 1**);

2. Investigar a associação entre a autoavaliação de saúde e as características percebidas da vizinhança, entre adultos residentes em quatro cidades da América Latina **(Artigo 2)**.

5 Método

Para contemplar o primeiro objetivo específico (Artigo 1) foram analisados dados de um inquérito domiciliar, denominado estudo "Saúde em Beagá" (2008-2009) e a caracterização objetiva do ambiente pelo método da observação social sistemática (OSS) (2011), ambos desenvolvidos pelo Observatório de Saúde Urbana de Belo Horizonte (OSUBH) da Universidade Federal de Minas Gerais (UFMG). O estudo "Saúde em Beagá" e a OSS incluíram dois dos nove Distritos Sanitários de Belo Horizonte, Oeste e Barreiro, que juntos correspondem a 24% dos 2.375.151 residentes da cidade[5]. Os dois distritos foram selecionados devido à proximidade geográfica e importante heterogeneidade interna em relação a diversos indicadores demográficos, socioeconômicos e de saúde[1]. Para contemplar o segundo objetivo específico (Artigo 2) foram analisados dados de um inquérito domiciliar (*CAF Survey*), realizado nos anos de 2016 e 2017, pelo Banco de Desenvolvimento da América Latina (CAF), formado em 1970 e constituído por 19 países, sendo 17 da América Latina e do Caribe, Espanha e Portugal e 13 bancos privados na região. A seguir, apresenta-se uma breve descrição de cada estudo, bem como os desfechos estudados. As demais variáveis e a análise estatística estão descritas em detalhes no corpo de cada artigo.

5.1 Método Artigo 1

5.1.1 Estudo Saúde em Beagá

Incluiu adolescentes e adultos, com 18 anos ou mais, residentes em domicílios selecionados a partir de um delineamento amostral probabilístico estratificado por conglomerados em três estágios. O Índice de Vulnerabilidade à Saúde (IVS) foi utilizado como fator de estratificação com o objetivo de garantir a presença proporcional de todos os níveis socioeconômicos na amostra[1]. O IVS é um indicador de saúde criado pela Secretaria Municipal de Saúde de Belo Horizonte que abrange aspectos relacionados ao saneamento, habitação, educação, renda, indicadores sociais e de saúde[65].

Dentro de cada estrato do IVS a seleção dos participantes se deu em três estágios: (a) setor censitário, selecionados com probabilidades distintas e com tamanho amostral

[65] CAIAFFA, W. T. et al. Urban health and governance model in Belo Horizonte, Brazil. In: Vlahov D, Boufford JI, Pearson C, Norris L, eds. *Urban Health: Global Perspective*. 1 ed. New York: The New York Academy of Medicine, p. 437-452, 2010.

proporcional ao total de setores do estrato (n=149); (b) domicílio, selecionado por meio de amostra aleatória simples dos domicílios cadastrados na base de dados da Prefeitura Municipal de Belo Horizonte (n=4.048); (c) um morador adulto (18 anos ou mais), totalizando 4.048 indivíduos adultos[1].

A coleta de dados do inquérito foi realizada por entrevistadores treinados e supervisionados pela equipe de pesquisadores do OSUBH. Foi conduzida em duas etapas sequenciais. Primeiro foi feito o arrolamento dos domicílios e em seguida a realização de entrevista face a face com o morador sorteado[1]. Foi utilizado um questionário estruturado e elaborado especificamente para o estudo com perguntas sobre características demográficas e socioeconômicas, estilo de vida, como prática de atividade física, perfil alimentar e consumo de álcool, autoavaliação de saúde, morbidade autorreferida, satisfação com a vida e percepção das condições da vizinhança[1]. Foram aferidos peso, altura e circunferência da cintura dos indivíduos, segundo técnicas padronizadas. Os instrumentos utilizados foram balança Tanita BC-553 (Tanita Corporation of America Inc., Arlington Heights, Estados Unidos), estadiômetro móvel WCS/Wood Compact (Cardiomed) e fita métrica inelástica, respectivamente[1].

Este estudo foi aprovado pelo Comitê de Ética em Pesquisa da Faculdade de Medicina da Universidade Federal de Minas Gerais (ETIC 253/06) (ANEXO 2). Todos os indivíduos assinaram um termo de consentimento livre e esclarecido.

5.1.2 Observação social sistemática (OSS)

Instrumento elaborado para determinar e quantificar características do entorno físico e social da vizinhança, potencialmente associadas aos eventos relacionados à saúde. A OSS é definida como a observação direta das condições físicas e interações sociais que ocorrem no local de moradia[66]. Este método tem sido utilizado em estudos na área da saúde e permite obter dados precisos do contexto[67,68].

O instrumento contemplou os domínios: físico, social e atividade física, caracterização dos imóveis, estético, serviços e segurança. As qualidades de confiabilidade do instrumento foram avaliadas em estudo prévio e se mostrou adequado para observação de características

[66] FREITAS, E. D. et al. A systematic social observation tool: methods and results of inter-rater reliability. *Cad Saude Publica*, v. 29, n. 10, p. 2093-2104, 2013.
[67] HINO, A. A. F.; REIS, R. S.; FLORINDO, A. A. Ambiente construído e atividade física: uma breve revisão dos métodos de avaliação. *Rev Bras Cineantropom Desempenho Hum*, v. 12, n. 5, p. 387-394, 2010.
[68] PROIETTI, F. A. et al. Unidade de Contexto e Observação Social Sistemática em Saúde: Conceitos e Métodos. *Physis Revista de Saúde Coletiva*, v. 18, n. 3, p. 469-482, 2008.

com maior estabilidade temporal, principalmente quanto a serviços, caracterização dos imóveis, ambiente para pedestres e segurança prévio[69].

A coleta de dados foi realizada entre os meses de abril e junho de 2011 na mesma área geográfica do estudo "*Saúde em Beagá"* por observadores independentes. As unidades de análise foram os segmentos de rua até 100 metros dos domicílios dos participantes do inquérito, exceto no domínio caracterização dos imóveis, no qual a unidade foi o imóvel. A definição dos seguimentos foi adotada com base na informação de que mais de 50% dos entrevistados do inquérito relataram a dimensão de sua vizinhança como sendo "as residências mais próximas da sua, seja no seu prédio, na sua rua" ou "até o final deste quarteirão", além do fato de que um quarteirão típico de Belo Horizonte tem 100 metros de extensão[69].

5.2 Método Artigo 2

Para entender um pouco mais sobre o desenvolvimento do artigo 2 faz-se necessário apresentar sobre o Projeto SALURBAL primeiramente, antes de apresentar sobre o CAF *Survey*.

5.2.1 Projeto SALURBAL

O Projeto SALURBAL iniciou em abril de 2017 e é financiado pelo *Wellcome Trust* como parte da iniciativa "*Our Planet, Our Health*", que prioriza pesquisas que investigam as relações entre o meio ambiente e a saúde humana[70]. Um dos objetivos principais do Projeto SALURBAL é compreender como as características físicas, econômicas e sociais dos ambientes urbanos podem afetar os níveis de saúde, as desigualdades em saúde e a sustentabilidade ambiental nas cidades latino-americanas[70]. O banco de dados do projeto inclui um total de 371 cidades com mais de 100.000 habitantes (conforme dados censitários de 2010), em 11 países da América Latina. Para a identificação das cidades a serem incluídas foram utilizados três diferentes critérios: a) administrativo; b) quantitativo, a partir de imagens

[69] COSTA, D. A. S.; MINGOTI, S. A.; ANDRADE, A. C. S.; XAVIER, C. C.; PROIETTI, F. A.; CAIAFFA, W. T. Indicadores dos atributos físicos e sociais da vizinhança obtidos pelo método de Observação Social Sistemática. *Cad Saúde Pública*, v. 33, n. 8, p. e00026316, 2017.
[70] DIEZ-ROUX, A. V. et al. A Novel International Partnership for Actionable Evidence on Urban Health in Latin America: LAC-Urban Health and SALURBAL. *Global Challenges*, p. 1800013, 2019.

de satélite; e c) com base em áreas metropolitanas definidas pelo país[71]. Assim, o termo cidade refere-se a uma combinação de unidades administrativas adjacentes (por exemplo, vários municípios) que fazem parte da extensão urbana determinada por imagens de satélite, representado, por exemplo, pelas regiões metropolitanas no Brasil[71]. Também foram definidas unidades urbanas menores para poder comparar vizinhanças ou setores dentro de uma cidade. Para facilitar a descrição das cidades e de seus componentes, foi definida uma terminologia comum baseada em "níveis". São eles: nível 1 é a cidade, que refere-se ao aglomerado urbano; nível 2, chamado de "*sub-city*", definida como uma unidade administrativa (por exemplo *comuna*, *município*), em um total de 1.436 "*sub-cities*"; e o nível 3, identificado como a menor área definida pelo censo de cada país (por exemplo setor censitário ou equivalente)[71].

As características do ambiente para cada nível foram obtidas usando uma variedade de fontes para o Brasil e os demais países latino-americano, são elas: *open street maps*, *open street maps e BRTData* e censos demográficos (estimativas populacionas)[71]. Posteriormente, esses dados do ambiente físico e social foram aninhados, sempre que possível, para nível 1, nível 2 e nível 3. Finalmente, a plataforma de dados foi exaustivamente trabalhada para a harmonização das variáveis afim de se criar medidas comparáveis[71]. Já os dados individuais foram obtidos de pesquisas nacionais de saúde, sistemas de informação dos países, bem como inquéritos populacionais realizados por outras instituições[71], como é o caso do CAF *Survey*, fonte de dados do segundo artigo desta Tese. Esses dados individuais foram vinculados às unidades territoriais.

5.2.2 *CAF Survey*

O *CAF Survey* é um inquérito domiciliar realizada pelo CAF anualmente, desde 2008, em várias cidades da América Latina. Consiste em entrevistas face-a-face onde é aplicado um questionário estruturado que coleta informações demográficas e socioeconômicas dos entrevistados, bem como um conjunto de características no nível domiciliar[72].

O questionário é organizado por módulos temáticos e inclui questões de acesso, qualidade e despesas em serviços de transporte urbano, coleta de lixo, água, saneamento e

[71] QUISTBERG, D. A. et al. Building a Data Platform for Cross-Country Urban Health Studies: the SALURBAL Study. *J Urban Health*, v. 96, p. 311-337, 2019.
[72] BANCO DE DESENVOLVIMENTO DA AMÉRICA LATIVA - CAF. Información Metodológica ECAF 2016. Disponível em: https://www.caf.com/media/7926277/Informe%20metodológico%20ECAF%202016.pdf. Acesso em: 30/07/2019.

energia elétrica, juntamente com indicadores de tipo e qualidade da habitação. Ele também inclui medidas de autoavaliação de saúde, segurança, entre outros. Um dos objetivos centrais do *CAF Survey* é servir de insumo para o principal relatório da organização, o Relatório sobre Economia e Desenvolvimento (RED). Para tanto, além dos módulos gerais supracitados, a pesquisa possui módulos variáveis que permitem atender à necessidade de dados do relatório de acordo com o assunto em estudo. A edição de 2016 do *CAF Survey* (ANEXO 3), fonte de dados do Artigo 2, acompanha o RED 2017: "Crescimento Urbano e Acesso às Oportunidades: Um Desafio para a América Latina" [72].

No período de novembro de 2016 a janeiro de 2017, foram entrevistados 12.905 indivíduos, entre 20 a 60 anos, distribuídos em 11 cidades da América Latina. São elas: Bogotá (COL), Buenos Aires (ARG), Caracas (VEN), Cidade do México (MEX), Cidade do Panama (PAN), Fortaleza (BRA), La Paz (BOL), Lima (PER), Montévideo (URY), São Paulo (BRA) e Quito (ECU). A amostragem foi semi-probabilística, estratificada em múltiplos estágios, com seleção aleatória de unidades de amostragem até o nível do ponto de amostragem e seleção sistemática de moradias com início aleatório dentro do ponto de amostragem. Para cada domicílio, um indivíduo foi entrevistado. Ademais, as cidades de Bogotá, Buenos Aires, Caracas e Fortaleza foram escolhidas para a realização de coleta de dados de uma sub-amostra em assentamentos informais. Foi considerado assentamento informal um conjunto de mais de 50 casas contíguas com as seguintes características: i) não ter títulos de propriedade; ii) falta de acesso formal aos serviços públicos de água, eletricidade e saneamento; e iii) ter deficiências de construção[72].

Como o Artigo 2 concentrou-se apenas nas evidências fornecidas pelas cidades participantes do Projeto SALURBAL, quatro das 11 cidades foram excluídas da amostra por não participarem do projeto: Caracas, La Paz, Montevidéu e Quito. Em seguida, todos os endereços dos indivíduos residentes nas sete cidades restantes foram georreferenciados para a "*sub-city*" dentro de cada cidade e esta foi considerada a unidade geográfica mais apropriada para este estudo, dado que elas são a unidade geográfica menor e mais homogênea disponível na amostra na época em que este trabalho estava sendo realizado. A "*sub-city*" foi então definida como *proxy* da vizinhança.

Considerando que três das cidades que participam do Projeto SALURBAL (Bogotá, Fortaleza e São Paulo) continham respondentes em apenas uma unidade de "*sub-city*", elas também tiveram que ser excluídas da amostra. Portanto, a amostra final consistiu em quatro cidades: Buenos Aires, Lima, Cidade do México e Cidade do Panamá. Essas quatro cidades tinham um número considerável de unidades de "*sub-city*". Finalmente, devido ao fato de que

o CAF *Survey* incluiu entrevistados residentes em assentamentos informais em Buenos Aires, esses participantes também foram excluídos da amostra para manter a comparabilidade entre as cidades.

5.4 Variáveis de desfecho

5.4.2 Satisfação com a vida (Artigo 1)

A satisfação com a vida, variável resposta do Artigo 1, foi medida por meio da Escala da Escada, desenvolvida por Cantril em 1965[73]. Este instrumento consiste em uma escala de zero a 10 pontos, representada esquematicamente por uma escada. O degrau zero significa a pior vida e o degrau 10 a melhor vida. O entrevistado foi solicitado a responder a seguinte pergunta: "Em relação à satisfação com sua vida atual, em qual degrau o (a) sr. (a) se encontra HOJE?" Para proceder às análises as respostas dos participantes foram categorizadas em: 1 = satisfeito (degraus 6 a 10) e 0 = insatisfeito (degraus 0 a 5) como em estudo prévio[74]. É importante ressaltar que foram testadas outras categorizações das respostas, como em quartis ou quintis, bem como a variável bruta, ou seja, sem categorizações. No entanto, em nenhuma das formas houve um ajuste adequado do modelo.

5.4.1 Autoavaliação da saúde (Artigo 2)

A autoavaliação da saúde, variável de desfecho do Artigo 2, foi avaliada por meio da pergunta "Em geral, você diria que a sua saúde é…?" As opções de resposta foram: ruim, regular e boa. Para as análises as repostas foram categorizadas em: 1 = ruim (ruim e regular) e 0 = boa (boa).

5.5 Variáveis explicativas

As variáveis explicativas utilizadas nas análises dos Artigos 1 e 2 serão explicadas em detalhes na seção de método de cada artigo.

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[73] CANTRIL, H. *The Pattern of Human Concerns*. New Brunswick, NJ: Rutgers University Press, 1965.
[74] CAVALLO, F. et al. Trends in life satisfaction in European and North-American adolescents from 2002 to 2010 in over 30 countries. *European Journal of Public Health*, v. 25, n. 2, p. 80-82, 2015.

5.6 Análise estatística

Um aspecto de importância central na epidemiologia social é que as diferenças na saúde e nos desfechos relacionados à saúde entre as pessoas podem ser parcialmente atribuídas às áreas em que elas vivem[2,54]. Pessoas com características semelhantes que moram em bairros diferentes podem ter diferentes estado de saúde devido a diferenças culturais, econômicas, influências políticas, históricas ou geográficas[2,54]. Por outro lado, pessoas diferentes podem, em certa medida, compartilhar estado de saúde semelhantes porque compartilham um ambiente comum[75]. Em outras palavras, os indivíduos aninhados ou agrupados em vizinhanças podem compartilhar o mesmo estado de saúde. A presença desses agrupamentos é, por sua vez, a principal motivo da aplicação de técnicas de regressão multinível[76]. Se o estado de saúde individual estiver correlacionado nas vizinhanças, a análise usando métodos de regressão comuns subestima os erros padrão para efeitos contextuais e fornece resultados tendenciosos[76]. Neste caso, a análise de regressão multinível é uma metodologia estatística que fornece informações sobre como as disparidades de saúde são distribuídas entre o indivíduo e os níveis da vizinhança, quantifica o agrupamento do estado de saúde individual nas vizinhanças e permite examinar as interações entre os efeitos da vizinhança e os fatores individuais[76]. Assim, como o objetivo geral desta Tese foi investigar a associação entre o ambiente físico e social com a satisfação com a vida e com a autoavaliação de saúde, em indivíduos residentes em centros urbanos de cinco países da América Latina, foram usadas análises multiníveis. No entanto, a descrição detalhada da análise estatística de cada estudo será descrita em detalhes na seção de método de cada artigo.

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[75] MACINTYRE, S.; ELLEWAY, A. Ecological approaches: rediscovering the role of the physical and social environment. In: Berkman L, Kawachi I, eds. Social epidemiology. New York: Oxford University Press, 2000:332–48.

[76] Merlo, J.; Chaix, B.; Yang, M.; Lynch, J.; Ra˚stam, L. A brief conceptual tutorial on multilevel analysis in social epidemiology: interpreting neighbourhood differences and the effect of neighbourhood characteristics on individual health. *J Epidemiol Community Health*, v. 59, p. 1022–1029, 2005.

6 Artigo 1

A multilevel model of life satisfaction among old people: individual characteristics and neighborhood physical disorder

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A multilevel model of life satisfaction among old people: individual characteristics and neighborhood physical disorder

Abstract

Background: Considering the lack of studies that examine built environmental factors associated with life satisfaction among old people in developing countries, particularly those focused on Brazil, the aim of this study was to estimate the prevalence of life satisfaction among old adults residents in a Brazilian urban center and to investigate its association with individual characteristics and objective measures of the built environment. **Methods:** A household survey (N=832) in Belo Horizonte, Minas Gerais, Brazil (2008-2009) and a Systematic Social Observation (SSO) was used in this study. Life satisfaction was assessed

through Self-Anchoring Ladder Scale, developed by Cantril, in 1965. Participants' answers were categorized as satisfied (rungs 6-10) and dissatisfied (rungs 0-5). A Multilevel Poisson regression analysis with robust variance was performed. **Results:** The prevalence of satisfaction with life was approximately 82%. Higher prevalence of life satisfaction was significantly associated with old people who reported higher incomes, higher religious participation, who practice physical activity and who perceive their health as good and very good. In contextual level, results showed that when the contextual features were adjusted separately by the individual characteristics they were no longer significant. The results also showed a lower prevalence of life satisfaction among those living in neighborhoods with higher physical disorder, even after adjusting for individual and other contextual characteristics. **Conclusions:** The present findings suggest that life satisfaction should be assessed whenever evaluating urban redevelopment programs designed to improve neighborhood characteristics, reducing physical disorder, especially among old adults.

Keywords: Aged, Built Environment, Urban Health, Multilevel Analysis

Background

Life satisfaction is a global assessment of one's life [1,2]. According to the Organization for Economic Cooperation and Development [3] life satisfaction "measures how people evaluate their lives as a whole rather than their current feelings". This term is often used interchangeably with happiness and subjective wellbeing in many studies around the world [4].

Life satisfaction closely relates to health [5], as an important predictor of mortality, morbidity, depression, and health status over the life course [6-9]. This link is especially pronounced in older people because the aging period is frequently accompanied by illnesses, disabilities, and dependency for care and support [5,10]. In addition, life satisfaction is considered an essential component of successful aging. There are ongoing research efforts to identify its associated factors that may help to reach the ideal aging model [11].

In old population, studies carried out in developed countries have identified some individual-level factors related to life satisfaction. They are demographic and socio-economic factors, lifestyle behavior, health status, social activities and connections. Regarding contextual-level factors, studies tend to be exclusively focused on the role of the social environment, such as social support and social interaction [5,12-16].

Recently, besides social environment, ecological theories of aging suggest that as people age and their functional capacity declines, the built (or physical) environment in which

they live holds an emerging role in their life satisfaction [17,18]. Urban built environment for senior residents may be a relevant promising strategy for improving old people's life satisfaction, with subsequent successful aging in this setting [19]. However, neither built environment nor life satisfaction in this population has been largely examined [20], especially in developing countries.

Considering the lack of studies that examine built environmental factors associated with life satisfaction among old populations in urban Latin America, particularly those focused on Brazil, the aim of this study was to estimate the prevalence of life satisfaction among old adults residents in a Brazilian urban center and to investigate its association with individual characteristics and objective measures of the built environment.

Methods

Study design

Data were obtained from a multi-method epidemiological study that included a household survey, called BH Health Study (Saúde em Beagá, in Portuguese language) and an objective environmental characterization using Systematic Social Observation (SSO), both carried out by the Observatory for Urban Health in Belo Horizonte (OSUBH) at the Federal University of Minas Gerais. Two of the nine health districts of Belo Horizonte (Oeste and Barreiro) were included in this study, which together account for 24% of the total of residents of the municipality [21]. Health districts comprise a geographical area that includes a population with epidemiological and social characteristics, their needs, and the health resources to attend it. These health districts were selected due to field research logistics and their internal heterogeneity in terms of select demographic, socioeconomic, and health indicators [22].

The BH Health Study (2008-9), included adults residing in households, through a probabilistic sampling design, stratified and clustered, in three stages: census tract (n=149); household (n=4,048); and a randomly selected adult resident (18 years or older) within eligible households, with the total of 4,048 participants. Individuals aged 60 years or older (n=834) were included in the present study analysis. Details on the survey have been published previously [22].

SSO was used to assess and quantify the built environmental characteristics associated with health-related events of the studied neighborhood. Observations were conducted between April and June of 2011 in the same geographical area of the BH Health Study by independent observers. The units of analysis were street segments within a 100- meter range, in any

direction, from the households of the survey's participants. Segments in the same census sector were considered the neighborhood corresponding to that census tract. The final sample included 1,295 segments. Instrument reliability was evaluated in a previous study and was adequate for the observation of characteristics with greater temporal stability, mainly regarding services, pedestrian environment, and safety [23]. Details on the method have been published previously [23,24].

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of Federal University of Minas Gerais (protocol n. ETIC 253/06) and the Ethics Research Committee of the Department of Municipal Health (073.2008).

Outcome

The response variable of life satisfaction was measured using the Self-Anchoring Ladder Scale (SALS), developed by Cantril [25]. This instrument consists of a scale from 0 to 10 points, represented schematically by a ladder, in which the lowest rung indicates the lowest satisfaction with life and the highest rung the highest. Participants were asked to answer the following question: "In relation to satisfaction with your current life, in which rung are you TODAY?" In order to carry out the analysis, participants' answers were categorized as satisfied (rungs 6-10) and dissatisfied (rungs 0-5), as in a previous study [26].

Explanatory variables

Individual and contextual level explanatory variables were used according to the source of information (survey or SSO). Individual variables were selected considering the literature review [5,14,15,27-29] and they included demographic and socio-economic variables, participation in religious activities, lifestyle and health status.

Demographic and socio-economic variables were: age (years), sex (female and male), marital status (with partner; widower; and without partner), schooling (0 to 4; 5 to 8; 9 to 11; and 12 or more years of formal education), employment situation (never worked; currently working; and has worked before), and family income as a multiple of the minimum monthly wage (< 2 minimum monthly wages; ≥ 2 minimum monthly wages). Religion participation was assessed by the frequency of participation in religious services (none; ≤ twice a month; > twice a month). Lifestyle variables were: physical activity (yes or no), assessed by the question: "Do you practice (or have you practiced) any physical activity in the past 3 months?" [30]; smoking habits (non-smoker; former smoker; and current smoker),

constructed from the following questions: “In your life, have you ever smoked cigarettes?” and “Do you currently smoke cigarettes?” [30]; and alcohol consumption (yes or no), assessed by the question: “Do you drink alcoholic beverages?” [30].

Finally, health status variables were: health services use (yes or no), assessed by the question: “Did you seek services or any professional appointment for your health care in the past 30 days?”; morbidity (none; one; and two or more illness), assessed by the question: “At any time, has a doctor or other health care professional ever said that you have any of the illness listed below: hypertension, high cholesterol, diabetes, asthma, arthritis, arthrosis, rheumatism, osteoporosis, chronic kidney disease, depression, migraines, epilepsy, tuberculosis, cancer, heart disease, lung disease, chronic digestive disease (ulcer/gastritis), or mental illness?”; and self-rated health (very good/good; fair; and poor/very poor), assessed by the question: “In general, would you say that your health is: very good, good, fair, poor, or very poor?”.

Contextual level variables were obtained from composite indicators, constructed using a principal component analysis via the covariance matrix, which was based on the information collected through SSO and aggregated by census tract. First, simple indicators were structured and then these indicators were grouped in domains from which composite indicators were respectively developed. The internal consistency of the proposed domains was considered acceptable, with Cronbach's alpha ranging from 0.591 to 0.820. Details on the indicator development process have been published recently [24].

This present study included the following SSO domains: *Street conditions and traffic infrastructure items*; *Walking environment*; *Accessibility*; *Spaces for physical activity and leisure*; *Physical disorder*; *Safety*; as well as the presence of Services, subdivided in *Food, health and recreational services*; *Garbage collection and school services* and *Automotive mechanics and repair services*. The *Street conditions and traffic infrastructure items* scale was developed based on the evaluation of the following items: public transport signage; prohibited parking signs; and presence of flowerbeds, speed bumps, radars, and traffic lights. The *Walking environment* scale included evaluations of items such as: sidewalk paving; trees for shading; sidewalk width at the smaller end; and favorable perception for walking. The *Accessibility* domain was developed based on the evaluation of the items: access ramps or tactile floors; and pedestrian traffic items (grids, crosswalks, walkways). The *Spaces for physical activity and leisure* scale included items regarding the evaluation and presence of spaces for physical activity; of parks and plazas; and favorable perceptions of the environment for physical activity. The *Physical disorder* domain was composed by the following items:

presence of trash (needles, cigarettes, cans and condoms) and graffiti in public urban equipments/facilities. The *Safety* scale was developed from the variables: public lighting; policing; and safety items in buildings/properties (either observed by the presence of the item or by a safety note informing the presence of dogs, alarms, wires, gate/pointed walls, windows with grids, electric fences, doormen, glass shards, and camera surveilance). The items of the *Food, health and recreational services* scale referred to the presence of: vendors of fresh and locally-grown food, convenience stores, vegetable vendors, private health care services, and public or private recreation facilities. The items of the *Garbage collection and school services* scale referred to the presence of: public or private garbage collectors; and elementary and high schools. Last, the items of the *Automotive mechanics and repair services* scale referred to the presence of: mechanical workshops and automotive repair centers. The scales range from 0-5, and a higher domain score denotes a greater presence of the attribute in the neighborhood.

Statistical analysis

Descriptive analysis was performed through frequency distributions, averages and standard deviation (SD). The prevalence of life satisfaction at a 95% confidence interval (95%CI) was estimated for the population sample and for each of the individual variables. The means and SD of the contextual variables (*Street conditions and traffic infrastructure items*; *Walking environment*; *Accessibility*; *Spaces for physical activity and leisure*; *Physical disorder*; *Safety*; *Food, health and recreational services*; *Garbage collection services and school*; and *Automotive mechanics and repair services*) were calculated and stratified by the satisfied and dissatisfied condition. All the contextual variables were considered protective factors for satisfaction with life, with the exception of the Physical Disorder considered risk factor.

To verify the association between life satisfaction and explanatory variables in the bivariate and multivariate analysis, the multilevel Poisson regression with robust variance was used. Robust Poisson regression was used because the outcome (Satisfied) had a prevalence of greater than 10%, causing the odds ratio to deviate from the true risk ratio [31]. Initially, a null model was adjusted to evaluate the contextual effects. Then, bivariate models were adjusted for individual and contextual variables. Finally, multivariate models were adjusted. The first one included individual variables whose p-value was equal to or smaller than 0.20 in the bivariate analysis. For this model, the stepwise-backward procedure was used to select the variable to retain ($p \leq 0.05$), except for age and sex, used as adjustment variables. Then, by

adding the individual variables that remained in the multivariate model, one model was adjusted for each contextual variable with a p-value ≤ 0.20 in the bivariate analysis. The last model was adjusted with all individual and contextual variables selected in the previous steps. In this step, multiplicative interactions between the contextual variables included in the multivariate model were tested. All multilevel analyses were performed using a fixed effects model with a random intercept and log function to obtain the prevalence ratio (PR) and 95%CI measures. The Akaike information criterion (AIC) was used to assess the appropriateness of model. Finally, the Spearman coefficient was used to estimate the correlations between contextual variables.

The software Stata, version 12.0 (StataCorp LP, College Station, USA) was used. All analyses were carried out taking the complex sample into account. Significance was set at 5%, with a 95%CI.

Results

Of the total 834 study participants, two were excluded due to lack of information on the outcome variable. The total number of census tracts analyzed in this study was 146, since one census tract lacked old adults residents from which to select participants. The mean number of old participants per census tract was 6, ranging from 1-15.

The prevalence of satisfied individuals was 81.95% (95% CI: 78.66-85.24); 56.41% were women and the mean age was 69.29 (SD=7.68). About 61% of old people reported to live with a partner, 51% had from 0 to 4 years of formal education; 77% reported having a family income of ≥ 2 minimum monthly wages. Bivariate analysis showed a positive dose-response between schooling and life satisfaction; that is, as the number of years of school education increases, there is an increase in the prevalence of old people who are satisfied with life. The prevalence of life satisfaction was higher among old people with a family income of ≥ 2 minimum monthly wages, those who practiced physical activity, those who never smoked and, those who perceived their health as good/very good or fair. The variables age, sex, marital status, employment situation, frequency of participation in religious services, alcohol consumption, health service use, and morbidity were not associated with life satisfaction in old people (Table 1).

Regarding contextual characteristics (Table 2), the Walking environment scale was the most positively evaluated, with a mean of 2.95 (SD=0.92). Contrarily, the Spaces for physical activity and leisure (mean=0.65; SD=0.94) and Food, health and recreational services (mean=0.65; SD=0.43) were the scales with the lowest evaluation, indicating the low

frequency of these attributes in the neighborhood. Bivariate analysis showed higher prevalence of life satisfaction reported among older adults living in places with greater presence of items of Walking environment; Safety; and Garbage collectors and school services. Street conditions and traffic infrastructure items; Accessibility; Space for physical activity and leisure; Physical disorder; Food, health and recreational services; and Automotive mechanics and repair services scales were not associated with life satisfaction in the univariate analysis in this population.

For the multivariate analysis six models were estimated as shown in Table 3. Model 1, consisting of only individual-level variables, suggested a higher prevalence of life satisfaction among old people with a family income of at least twice the minimum monthly wage (PR: 1.13; 95% CI: 1.02-1.26), among those who participated in religious services more than twice a month (PR: 1.20, 95% CI: 1.02-1.42), among those who practiced physical activity (PR: 1.12, 95% CI: 1.02 - 1.22), and among those who perceived their health as good/very good (RP: 1.23, 95% CI: 1.03-1.46). After adjustments for individual variables in Model 1, none of the contextual scales for *Walking environment*; *Physical disorder*; Safety; and *Garbage collection and school services* scales (models 2 to 5) were significantly associated with life satisfaction. However, significant associations were noted for the *Physical disorder* scale, in model 6 (PR: 0.94, 95% CI: 0.88-0.99). This model shows that old people living in census tracts with greater physical disorder reported less satisfaction with life. Finally, none of the interactions terms between the contextual variables tested were statistically significant.

Table 4 presents the correlation matrix between the scales included in the multivariate model. There were a significant and positive correlation between: 1. *Walking environment* and *Safety* scales; 2. *Walking environment, Garbage collection and school services* scales; 3. *Physical Disorder* and *Safety* scales; 4. *Safety, Garbage collection and school services* scales. A significant and negative correlation encountered were between: 1. *Walking environment, Physical Disorder* scales; and 2. *Physical Disorder, Garbage collection and school services* scales.

Also, we estimated multinomial and proportional odds models using life satisfaction on an ordinal scale. However, as the original variable had a very asymmetric skewed distribution to the right, these models failed to be adequately adjusted.

Discussion

This study aimed to investigate the association of life satisfaction with individual characteristics and objective measures of the built environment among old population living

in Belo Horizonte, Brazil. The multilevel analyses showed higher prevalence of life satisfaction in old people with higher incomes, higher religious participation, who practiced physical activity and who had good/very good self-rated health. In addition, we observed that when the contextual characteristics were adjusted separately by the individual characteristics they were not significant. We also observed a lower prevalence of life satisfaction among those who lived in neighborhoods with high physical disorder levels, after adjusting for individual and other contextual characteristics such as walking environment, safety, and presence of garbage collection and school services.

Given the main objective of this paper, we will first discuss the context-level variables and then the individual-level variables. A recent study, carried out among inhabitants of urban areas in five different European countries, corroborates with our finding. This study showed that individuals who perceived their neighborhood as having lower physical disorder - for example: free from rubbish, litter and graffiti - were more likely to be satisfied with their lives [32]. No studies that investigated the association between life satisfaction and objective measures of physical disorder were found.

Neighborhood physical disorder is understood as a key to indicate that informal social control has been broken [33]. This characteristic may have deep effects on the development of neighborhood trust, attachment, and participation in community life [34-36]. In the Brazilian context, neighborhood with higher social vulnerability has higher physical disorder [24]. Within a disordered environment, many neighbors, especially older adults, may be reluctant to venture outside, reducing their ability to form ties and observe positive neighborhood interaction [37]. Additionally, the literature regarding life satisfaction and social environment among old people demonstrates that perceived social cohesion and social interaction are positively associated with life satisfaction [16,38,39].

Social cohesion and social interaction may influence life satisfaction of old people in several ways. First, social cohesion positively impacts the strength of relationships and social interactions, as well as collective attachment to the neighborhood, and is thus expected to enhance individuals' life satisfactions [40]. Second, elders living in more cohesive communities may receive more instrumental and effective support [38], which are resources that can contribute to life satisfaction [41,42]. Third, neighborhood social cohesion and social interaction may promote both physical activity [43] and greater religious participation among elders. Previous studies as well as this study show that religious participation and physical activity are positively associated with life satisfaction [14,28], as will be discussed below.

Furthermore, previous studies report the association between objective measures of neighborhood physical disorder or self-perceived neighborhood physical disorder, and several health-related outcomes and risky health-related behaviors in adults [44-49], explained through the psychosocial processes of perceived danger and weakened social cohesion and social interaction [33].

When each contextual characteristic is adjusted for individual characteristics (models 2 to 5), they are not associated with life satisfaction. This could perhaps be explained due to the fact that the individual characteristics play a more important role in life satisfaction in the old population. In addition, the main results observed in this study (model 6) can be explained due the fact that the scales are correlated with each other.

This study did not find any association between life satisfaction and other built environment characteristics. Studies that investigated the associations between objectively assessed and perceived built environment characteristics and life satisfaction have found that living in neighborhoods with a higher percentage of streets with well-maintained green areas and residential buildings in good conditions, more water and green space or public parks, and with easy access to convenient public transportation and to cultural and leisure amenities was associated with life satisfaction [4,16,32,50]. However, these studies are related to a total adult population and are not specific to older adults.

Age was found to be positively associated with higher prevalence of satisfaction with life. This result is in agreement with other studies [5,51,52], and different authors have postulated that this association could be happening through a socioemotional selectivity theory, suggesting that as people age, they accumulate emotional wisdom that leads to the selection of more emotionally satisfying events, friendships, and experiences [5,53].

Also, at the individual level, we found that higher income was associated with higher prevalence of life satisfaction, corroborating the results of studies focused on non-old and old population. A study conducted by the Gallup Organization of more than 450,000 non-old adult residents in the United States demonstrated that low income was associated with low life satisfaction [54]. A research project carried out in Turkey analyzed data from 1990 to 2013 and the results showed that the prevalence of dissatisfaction was higher for low-income old people. This study also showed that in wave 2005-2009, the odds of dissatisfaction significantly decreased, showing an improvement from the previous wave, hit by a severe economic crisis in 2001 [55]. In addition, surveys developed in Central Eastern European countries and Sweden reported that life satisfaction is associated with income among the old adults [12,27]. These studies' findings bolster the conclusion that income is associated with

life satisfaction in countries with socioeconomic characteristics similar to Brazil [5,13,56]. This association may be explained by the greater ability/resources of high-income people to fulfill essential and psychological needs, increasing satisfaction with one's standard of living through the access to goods and services [57].

In this study, participation in religious services was associated with life satisfaction, indicating that old people who participate in religious activity more than twice a month report higher life satisfaction than those who do not participate or participate less often. These findings are corroborated by others studies among general adults and old populations in particular [28,29,58-61]. Religious activities may influence in life satisfaction for numerous reasons. First, religious communities provide social integration and support for their members and encourage them to have faith in situations of vulnerability [62]; second, religiously active individuals tend to have greater resiliency following divorce, unemployment, illness, and bereavement, recovering more quickly and more fully; and third, religious communities promote norms regarding personal lifestyles, such as interpersonal and familial relationships, and health behaviors, which could enhance an individual's life satisfaction [63].

Physical activity was another individual-level characteristic that was associated with greater life satisfaction. Life satisfaction was more prevalent in old people who reported to practice physical activity. Cross-sectional and prospective studies examining the association between physical activity and life satisfaction in older adults have found that more active people tend to experience greater life satisfaction compared to their less active peers [64-67]. Additionally, a recent meta-analysis on this theme showed that old people exhibit a stronger association between physical activity and life satisfaction [14]. Physical activity may lead to higher life satisfaction not only due to the physiological benefits it confers, especially to functionality and physical health, but also due to the fact that it enables greater social interaction.

Finally, life satisfaction was more prevalent among participants that had a good/very good self-rated health. Other studies, in both developed and developing countries, have shown similar results among old people [15,27,68,69]. Health plays an important role in life satisfaction and self-rated health provides more information about life satisfaction, as compared to medically-based health measures [15,69]. A perceived physical vulnerability can amplify the effects of dissatisfaction in old people [70] and, moreover, the perceptions of aging itself influence and are influenced by psychological, physical, functional, clinical, and environmental dimensions [71].

One strength of our study was the use of objective measures of the built environment. This is the first study based on Latin America, to our knowledge, that investigated the built environment characteristics associated with older adults' satisfaction, using multilevel analysis. Many researches that investigated health or other related health outcomes and urban arrangements exclusively rely on the perception of participants about the neighborhood that they live. The objective measurement of the environment can minimize the possibility of a "common source" bias [72]. Individuals' perceptions of the environment may be influenced by personal factors. Also, individuals' residences may be based on their health or their predisposition to given behaviors [73].

We would like to highlighted that, although the item we used to assess life satisfaction is an accepted measurement approach for this topic worldwide [74,75], there is no gold standard measure for this construct, and self-reported measures of life satisfaction can be vulnerable to a variety of response biases [76]. For this reason, comparisons between studies are quite difficult and their interpretation should be circumspect, because life satisfaction has been measured in different ways across studies from different parts of the world. On the other hand, the administration of the SALS is simple, does not require a major investment of time for either, respondents and interviewers, and it is easily understood by participants [74]. These characteristics of the instrument are especially important in the Brazilian context where 42.3% of the population has less than 8 years of schooling [77], and even higher in the population of our study. Therefore, despite the absence of a transcultural adaptation to Portuguese or validated in the country, SALS is considered a robust measurement of the life satisfaction and its use is strongly acceptable in our context.

Furthermore, other methodological issues should be considered when interpreting the results. Data from this study, by design, are from only two health districts, namely Barreiro and Oeste. Therefore, findings may not be representative to the entire population of the city, although they are similar to others health districts in terms of demographics and socioeconomic characteristics. The BH Health Study was not designed specificaly to assess old populations and thus, for the present study, we used a subset of the sample as a whole. Consequently, conducting analyses stratified by age, as found in additional studies in the literature, is unfeasible due to the small size of the sample of participants included in the 80 years old or older group (n=100), as well as the small size of the sample in some census tracts. The cross-sectional design of this study does not allow for the inference of temporality between exposures and outcomes and the results are susceptible to influence by behavioral, cultural and social factors due to the use of self-reported measures at the individual level.

At the contextual level, the measurement of some attributes may be limited as certain items are liable to temporal variation [24]. A more reliable measurement would require more than one observation for the same segment, so conditions could be averaged across different times and days of the week [24]. Additionally, the assessment of the built environment was conducted 3 years after the BH Health Study. On the other hand, the multilevel analysis approach we used, adjusted for the main individual and also for contextual factors, which are known to confound the associations researched, is considered the most appropriate for evaluating contextual characteristics. This modeling strategy allows for the examination of relative variance at different hierarchical levels and encourages the development of a research hypothesis that examines the role of context [78].

Conclusions

Despite limitations, this analysis advances into the literature regarding built environment and life satisfaction and provides the first estimates of such associations for an old population living in an urban area of Brazil. Some individual characteristics, as well as the neighborhood physical disorder were associated with life satisfaction. Future studies should include prospective analyses and should explore multiple environmental characteristics, such as social cohesion, social interaction, and also variables of the social environment. The present findings suggest that life satisfaction should be assessed whenever evaluating urban redevelopment programs designed to improve neighborhood characteristics and to reduce physical disorder, especially among old adults.

Abbreviations

SSO: Systematic social observation; OSUBH: Observatory for Urban Health in Belo Horizonte; SALS: Self-Anchoring Ladder Scale; SD: Standard deviation; 95%CI: 95% confidence interval; PR: Prevalence ratio; AIC: Akaike information criterion.

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Availability of data and materials

Data will not be shared. Data were from a household survey conducted by the Observatory for Urban Health in Belo Horizonte (OSUBH) at the Federal University of Minas Gerais. Currently, the authors do not have any special access privileges to these data and confirm that interested researchers may apply for access to these data in the manner described. Data supporting the conclusions of this study are included within the article.

Author Contributions

CTV: participated of the conceptualization, methodology, formal analysis, writing—original draft preparation, and writing—review and editing the manuscript. ACSA: participated of the conceptualization, methodology, formal analysis, and writing—review and editing the manuscript. FAP: participated of the conceptualization, investigation, writing—review and editing the manuscript, and funding acquisition. CCX: participated of the conceptualization, investigation, writing—review and editing the manuscript, and funding acquisition. AALF: participated of the conceptualization and writing—review and editing the manuscript. WTC: conceptualization, methodology, formal analysis, writing—review and editing the manuscript, funding acquisition, and she is the project administration. All authors read and approved the final manuscript and consent to publication in this review.

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Federal University of Minas Gerais (protocol n. ETIC 253/06) and the Ethics Research Committee of the Department of Municipal Health (073.2008). Each participant signed an informed consent form. Respondents were guaranteed utmost confidentiality, privacy and anonymity.

Consent for publication

Not Applicable.

Conflicts of Interest

The authors declare no conflict of interest.

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Table 1: Univariate analysis of life satisfaction and individual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008-2011.

VARIABLES	TOTAL	LIFE SATISFACTION		PR (95% CI)	p-value
	N = 832	Satisfied	Dissatisfied		
Age m(SD)	69.29 (7.68)	69.54 (7.74)	68.18 (7.29)	1.02 (0.99-1.05)[1]	0.138
Sex (%)					
Male	43.59	80.52	19.48	0.97 (0.89-1.05)	0.446
Female	56.41	83.05	16.95	1.00	
Marital status (%)					
With partner	61.11	81.81	18.19	1.01 (0.90-1.14)	0.814
Widower	23.19	83.19	16.81	1.03 (0.90-1.18)	0.653
Without partner	15.7	80.66	19.34	1.00	
Schooling (%)[a]					
12 or more years	16.2	89.19	10.81	1.15 (1.04-1.27)	0.006
9 to 11 years	19.58	87.14	12.86	1.13 (1.02-1.25)	0.025
5 to 8 years	13.27	82.79	17.21	1.07 (0.93-1.27)	0.339
0 to 4 years	50.95	77.43	22.57	1.00	
Employment situation (%)					
Currently working	22.84	77.76	22.24	0.90 (0.80-1.02)	0.296
Has worked before	62.26	82.46	17.54	0.96 (0.86-1.06)	0.404
Never worked	14.91	86.20	13.80	1.00	
Family income (%)[b]					
≥ 2 mw	77.21	84.50	15.50	1.15 (1.04-1.28)	0.007
< 2 mw	22.79	73.21	26.79	1.00	
Religion participation (%)[a]					
≤ 2 x/month	29.83	80.17	19.83	1.17 (0.99-1.38)	0.067
> 2 x/month	58.54	84.74	15.26	1.11 (0.93-1.32)	0.258
None	11.63	72.41	27.59	1.00	
Physical activity (%)					
Yes	57.86	87.84	12.16	1.13 (1.03-1.24)	0.010
No	42.14	77.66	22.34	1.00	
Smoking habits (%)					
Non-smoker	51.72	84.30	15.7	1.20 (1.01-1.44)	0.041
Former smoker	37.96	82.00	18.00	1.17 (0.98-1.40)	0.080

Current smoker	10.32	69.97	30.03	1.00	
Alcohol consumption (%)					
Yes	29.51	82.22	17.78	1.00 (0.92-1.10)	0.921
No	70.49	81.83	18.17	1.00	
Health service use (%)					
Yes	37.31	79.93	20.07	0.96 (0.88-1.05)	0.395
No	62.69	83.15	16.85	1.00	
Morbidity (%)					
None	9.7	89.28	10.72	1.11 (0.99-1.24)	0.085
One	18.38	83.29	16.71	1.03 (0.91-1.17)	0.606
Two or more	71.92	80.62	19.38	1.00	
Self-rated health (%)					
Good/Very good	50.86	85.59	14.41	1.29 (1.07-1.55)	0.007
Fair	36.6	82.20	17.80	1.24 (1.01-1.51)	0.033
Poor/Very poor	12.46	66.31	33.69	1.00	

mw = minimum wages; m=Mean; SD=standard deviation

[a]1 missing; [b]30 missing; [1]For an increase of 5 years in age

Table 2. Univariate analysis of life satisfaction and contextual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008-2011.

VARIABLES	TOTAL	LIFE SATISFACTION		PR (95% CI)	p-value
	N = 146	Satisfied	Dissatisfied		
Street conditions and traffic infrastructure items m(SD)	0.81 (0.89)	0.93 (0.89)	0.90 (0.87)	1.01 (0.97-1.05)	0.762
Walking environment m(SD)	2.76 (1.04)	2.98 (0.93)	2.78 (0.82)	1.05 (1.01-1.08)	0.008
Accessibility m(SD)	1.13 (0.74)	1.26 (0.90)	1.26 (0.92)	1.00 (0.96-1.04)	0.980
Spaces for physical activity and leisure m(SD)	0.65 (0.99)	0.65 (0.96)	0.58 (0.88)	1.01 (0.98-1.05)	0.423
Physical disorder m(SD)	1.86 (0.77)	1.72 (0.72)	1.86 (0.79)	0.95 (0.90-1.00)	0.082
Safety m(SD)	1.46 (1.06)	1.75 (1.12)	1.50 (1.07)	1.04 (1.00-1.07)	0.026
Food, health and recreational services m(SD)	0.63 (0.47)	0.65 (0.41)	0.66 (0.49)	0.99 (0.92-1.07)	0.775
Garbage collection and school services m(SD)	1.26 (0.81)	1.30 (0.77)	1.16 (0.70)	1.04 (1.01-1.08)	0.020
Automotive mechanics and repair services m(SD)	2.26 (0.58)	2.28 (0.64)	2.26 (0.55)	1.01 (0.96-1.06)	0.680

m=Mean; SD=standard deviation

Table 3. Multilevel models of life satisfaction, individual and contextual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008-2011.

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
VARIABLES	**PR (95% CI)**	**p-value**	**PR (95% CI)**	**p-value**	**PR (95% CI)**	**p-value**	**PR (95% CI)**	**p-value**	**PR (95% CI)**	**p-value**	**PR (95% CI)**	**p-value**
Individual characteristics												
Age	1.03 (1.01-1.06)[1]	0.013	1.03 (1.01-1.06)[1]	0.015	1.03 (1.01-1.06)[1]	0.010	1.03 (1.01-1.06)[1]	0.019	1.03 (1.01-1.06)[1]	0.014	1.03 (1.01-1.06)[1]	0.015
Sex												
Male	0.94 (0.87-1.02)	0.170	0.94 (0.87-1.02)	0.165	0.94 (0.87-1.02)	0.152	0.95 (0.87-1.03)	0.193	0.95 (0.87-1.03)	0.176	0.95 (0.87-1.03)	0.202
Female	1.00		1.00		1.00		1.00		1.00		1.00	
Family income												
≥ 2 mw	1.13 (1.02-1.26)	0.024	1.12 (1.00-1-26)	0.051	1.13 (1.01-1.26)	0.028	1.12 (1.01-1.26)	0.048	1.13 (1.01-1.26)	0.034	1.11 (0.98-1.25)	0.088
< 2 mw	1.00		1.00		1.00		1.00		1.00		1.00	
Religion participation												
> 2 x/month	1.20 (1.02-1.42)	0.027	1.20 (1.02-1.42)	0.027	1.20 (1.02-1.43)	0.025	1.21 (1.02-1.42)	0.026	1.20 (1.02-1.42)	0.019	1.21 (1.03-1.44)	0.022
≤ 2 x/month	1.14 (0.95-1.37)	0.147	1.14 (0.95-1.37)	0.153	1.14 (0.95-1.37)	0.152	1.15 (0.96-1.37)	0.141	1.14 (0.95-1.37)	0.149	1.15 (0.95-1.38)	0.143
None	1.00		1.00		1.00		1.00		1.00		1.00	
Physical activity												
Yes	1.12 (1.02-1.22)	0.019	1.11 (1.02-1.22)	0.022	1.11 (1.02-1.22)	0.018	1.11 (1.02-1.22)	0.020	1.11 (1.02-1.22)	0.021	1.11 (1.01-1.21)	0.023
No	1.00		1.00		1.00		1.00		1.00		1.00	
Self-rated health												
Good/Very good	1.23 (1.03-1.46)	0.006	1.22 (1.03-1.45)	0.021	1.23 (1.04-1.46)	0.018	1.22 (1.03-1.46)	0.025	1.23 (1.03-1.46)	0.020	1.21 (1.02-1.44)	0.026
Fair	1.20 (1.00-1.45)	0.051	1.20 (1.00-1.45)	0.055	1.20 (1.00-1.45)	0.047	1.20 (0.99-1.45)	0.056	1.20 (1.00-1.45)	0.052*	1.20 (1.00-1.44)	0.052

Poor/Very poor	1.00		1.00		1.00		1.00		1.00		1.00	
Contextual characteristics												
Walking environment			1.02 (0.98-1.06)	0.444							0.99 (0.95-1.04)	0.741
Physical disorder					0.95 (0.90-1.01)	0.092					0.94 (0.88-0.99)	0.048
Safety							1.01 (0.98-1.05)	0.448			1.03 (0.98-1.07)	0.209
Garbage collection and schools services									1.02 (0.98-1.06)	0.418	1.01 (0.97-1.04)	0.761
Random effects												
AIC	1,579.70		1,581.93		1,580.88		1,581.6		1,581.61		1,586.47	

mw = minimum wages; AIC = Akaike information criterion

N individual level = 801; N contextual level = 146; ¹For an increase of 5 years in age

Null model: AIC = 1,639.54

Table 4. Correlation matrix between the scales.

SCALES	Walking environment	Physical Disorder	Safety	Garbage collection and School services
Walking environment	1			
Physical Disorder	-0.12*	1		
Safety	0.54*	0.18*	1	
Garbage collection and School services	0.50*	-0.09**	0.34*	1

*P ≤ 0.01; **P ≤ 0.05

7 Artigo 2

Physical disorder and poor self-rated health in adults living in four Latin American cities: a multilevel approach

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Abstract

Introduction: Neighborhood features constitute sources of chronic stress that may increase the risk of poor self-rated health. **Objective:** To investigate the association between self-rated health and perceived neighborhood characteristics among adults living in four Latin American cities. **Method:** Data were obtained from a population-based survey of adults between 20 and 60 years old carried out by the Development Bank of Latin America (CAF), from 2016 to 2017, in Buenos Aires, Lima, Mexico City, and Panama City. Self-rated health was measured with the question "In general, would you say your health is ...?" The response options bad, fair and good were categorized as poor (bad and fair) and good (good). The explanatory variables were: neighborhood scales, created through empirical Bayesian estimates from a multilevel model, comprising the following domains: physical disorder, social disorder, access to services, access to leisure spaces, and social cohesion. The covariates were: individual age, sex, education, wealth index (created with variables of ownership of consumer goods, access to basic services and housing characteristics), length of residency in the respective neighborhood and city where the individual lived; and a neighborhood "social environment index", created with harmonized census variables. Multilevel logistic regressions with two levels (individual and neighborhood) were used. **Results:** Poor self-rated health was reported by 34.73% (95% CI: 33.17–36.29) of the participants. Poor health was positively associated with Physical Disorder (OR = 1.23 per SD; 95% CI: 1.03 to 1.47), even after controlling for individual and contextual-level characteristics. **Conclusion:** Physical Disorder

was independently associated with poor health. Addressing physical disorder may contribute to improving health in cities.

Keywords: Self-rated Health, Physical Disorder, Environment, Health Status, Latin America, Urban Health, Multilevel Analysis

Introduction

Health should be understood in its physical, psychological and social dimensions (BRADLEY, GOETZ & VISWANATHAN, 2018). There are various strategies used to measure health; an important one is the self-rated health. Self-rated health, defined as the individual's own evaluation of his or her health, has been used in public health to monitor the health of populations (FYLKESNES & FORDE, 1992; MIILUNPALO et al., 1997; KAWADA, 2003). This measure seems to reflect a comprehensive perception of all dimensions of the individual health unlikely to be observed by other type of health measures (MIILUNPALO et al., 1997). It can also express health behaviors, well-being, trajectories in health over time, socioeconomic conditions, and overall quality of life (DOWD & ZAJACOVA, 2007). In addition, sub-clinical dysfunctions unlikely to be diagnosed as medical conditions can be perceived by individuals and incorporated into their self-assessment (JYLHÄ, 2009).

The single question used to evaluate self-rated health has attracted health researchers' attention worldwide, since it is easily understood by participants (KAWADA, 2003), low-cost (DESALVO et al., 2005), and also especially because the accumulated evidence of its association with morbidity (THEME FILHA, SZWARCWALD & SOUZA JUNIOR, 2008), health service utilization (DESALVO et al., 2005), and, most importantly, mortality (FALK et al., 2017; GUIMARÃES et al., 2012). Individual factors that can influence self-rated health have been extensively studied (PAVÃO, WERNECK & CAMPOS, 2013). Evidence suggests that health status is associated with demographics and socioeconomics characteristics, lifestyle, and psychological and physical health, and these associations can differ according to age, gender, and presence of morbidity (ANDRADE & MEHTA, 2018; KIM et al., 2017; MEIRELES et al., 2015).

Beyond individual factors, the place where people live has a substantial influence on health (DIEZ-ROUX, 2001). There is growing interest on studies that investigate the potential effects of neighborhood characteristics on several health outcomes, especially on self-rated health (GOMEZ et al., 2019; HÖFELMANN et al., 2015). People living in more deprived

neighborhoods were more likely to rate their health as fair or poor compared with residents of more wealthy ones (BAK, ANDERSEN & DOKKEDAL, 2015; WHITE et al., 2011) and some of these findings have been supported by longitudinal studies (YEN & KAPLAN, 1999). Indeed, neighborhood effects operate through the availability and accessibility of health services, public facilities, infrastructure, attitudes towards health and behaviors, and social cohesion (OU et al., 2018; RODRIGUES et al., 2018; STEPTOE & FELDMAN, 2001).

Despite the importance of the topic, the vast majority of research examining self-rated health and neighborhood characteristics relied on relatively small sample sizes with low response rates, which might limit external validity, and failed to account for the effect of neighborhood confounder. In addition, this impact has not been widely explored in Latin America, region with the highest socioeconomic inequality in the world and where health inequity has become a greater concern (BECERRA-POSADA, 2015; UNDP, 2010). Furthermore, a recent systematic review that examined the associations between neighborhood characteristics and self-rated health in Latin America concluded that there is a relatively small number of studies and a heterogeneity between them that does not allow for the identification of patterns that could generalize to the largest urban settings of the region (GOMEZ et al., 2019). Therefore, the aim of this study was to investigate the association between self-rated health and perceived neighborhood characteristics among adults living in four Latin American cities.

Methods

Study Design

Data were obtained from a population-based survey carried out by the Development Bank of Latin America (CAF Survey), from November 2016 to January 2017. The CAF Survey used a semi-probabilistic, multi-stage stratified sampling approach, with a random selection of sampling units up to the sample space and the systematic selection of dwellings with a random starting point within the sampling space. For each household, one individual was interviewed (CAF, 2016). The survey included 12,905 participants, between 20 and 60 years old, in 11 Latin American cities: Bogota (COL), Buenos Aires (ARG), Caracas (VEN), Fortaleza (BRA), La Paz (BOL), Lima (PER), Mexico City (MEX), Montevideo (URY), Panama City (PAN), Quito (ECU) and Sao Paulo (BRA) (CAF, 2016). Data were collected through in-person interviews. A structured questionnaire was applied containing respondent

demographic and socioeconomic information, self-perceived neighborhood characteristics, as well as a set of characteristics at the household level (CAF, 2016).

This study focused only on evidence provided by cities participating in the *Salud Urbana en América Latina* (SALURBAL) Project. This project is funded by the Wellcome Trust in 2017 as part of the "Our Planet, Our Health" initiative and aims to leverage the heterogeneity and innovation observed across Latin American cities to study drivers of urban health, health equity, and environmental sustainability in order to inform urban policies worldwide (DIEZ-ROUX et al., 2019). In SALURBAL Project city is defined as a single administrative unit (e.g., municipio) or combination of adjacent administrative units (e.g., several municipios) that are part of the urban extent as determined from satellite imagery (DIEZ-ROUX et al., 2019). Thus 4 of the 11 cities were excluded from the sample: Caracas, La Paz, Montevideo, and Quito. After that, all individual responses from the 7 remaining cities were georeferenced to the "sub-city" of the cities. "Sub-city" is defined, in the SALURBAL Project, as an administrative unit (e.g., *comuna, municipio*) nested within a city (QUISTBERG et al., 2019), and this was considered to be the most appropriate geographical unit for this study, given that they are the smallest and most homogeneous geographical unit available in the sample at the time this work was being carried. "Sub-city" was then taken to be the neighborhood proxy.

Considering that 3 of the cities that participate in the SALURBAL Project (Bogotá, Fortaleza and São Paulo) contained respondents in only one "sub-city" unit, they also had to be excluded from the sample. Therefore, the final sample consisted of only 4 cities: Buenos Aires, Lima, Mexico City, and Panama City. These 4 cities had a great number of "sub-city" units. Finally, due to the fact that the CAF Survey included 550 respondents residing in informal settlements in Buenos Aires (CAF, 2016), different from other cities, these participants were also excluded from the sample in order to maintain comparability across cities.

This study is a secondary analysis that used publicly available identified data, and therefore no ethical approval was requested. The data can be accessed at the link http://scioteca.caf.com/handle/123456789/1411.

Outcome

The response variable was self-rated health, measured with the question "*In general, would you say your health is ...?*" The answer options bad, fair and good were categorized in: 1 = poor (bad and fair) and 0 = good (good).

Explanatory variables

The explanatory variables were neighborhood scales created through dimensionality reduction of the variables related to self-perceived neighborhood characteristics. The neighborhood scales were: Physical Disorder, Social Disorder, Access to Services, Access to Leisure Spaces, and Social Cohesion, since they were different domains in the original survey.

The Physical Disorder scale was constructed based on the following questions: "*Do any of the following situations occur within 3 blocks or less of your home?:* (1) *Abandoned buildings, houses or lots;* (2) *Buildings, houses or lots taken illegally or invaded;* (3) *Landfills;* (4) *Poorly lit streets; and* (5) *Drug purchases and use*". The answer choices to these questions were yes and no.

The Social Disorder scale was constructed from the following Likert-type questions: "*On a scale of 1 to 5, where 1 means "never" and 5 means "always", how often would you say that the situations I present you occur in your block?:* (1) *Acts of aggression and / or offenses;* (2) *Indigence / Begging;* (3) *Gang activity;* (4) *Prostitution; and* (5) *Conflict between neighbors*". The answer choices to these questions were: never, rarely, sometimes, almost always and always.

The Access to Services scale was constructed through the following questions: "*In time walking, how far are the following establishments from your home (consider the closest)?:* (1) *Hospitals or health centers;* (2) *Public primary or secondary schools;* (3) *Gardens or child care centers for children under 5 years; and a* (4) *Police Station*" and (5) "*How long do you need to walk from your home to access the Bus, collective or articulated transport (metrobus, Transmilenio)*". The answer choices to these questions were: less than 10 minutes, between 10 and 30 minutes and more than 30 minutes.

The Access to Leisure Spaces scale was constructed through the following questions: "*How long would it take you to walk to the closest of the following services or public establishments?:* (1) *Parks, plazas or green areas;* (2) *Public libraries or cultural centers; and* (3) *Community sports or recreation centers*". The answer choices to these questions were: less than 10 minutes, between 10 and 30 minutes and more than 30 minutes.

Finally, the Social Cohesion scale was constructed based on the following questions: "*In the event that you have an emergency such as job loss, illness or other, to which of the following persons can you turn:* (1) *Borrowing money from family;* (2) *Borrowing money from friends;* (3) *Borrowing money from neighbors;* (4) *Childcare assistance from family;* (5) *Childcare assistance from friends;* (6) *Childcare assistance from neighbors;* (7) *Requesting*

temporary shelter from family; (8) *Requesting temporary shelter from friends; and* (9) *Requesting temporary shelter from neighbors*". The answer choices to these questions were yes and no.

To create the neighborhood scales, Cronbach's Alpha was first used to assess the confiability of the questions. It was found that the questions had an acceptable internal consistency, with Cronbach's Alpha ranging from 0.64 to 0.76 (Table 1).

Second, empirical Bayesian estimates from a multilevel model were used (HÖFELMANN et al., 2015; FRICHE et al., 2012; MUJAHID et al., 2007): level 1 corresponded to item responses within individuals; level 2 corresponded to persons nested within the neighborhood; and level 3 corresponded to the neighborhood. We adjusted one model by city for each scale. The sample intra-neighborhood correlation coefficients (ICC) varied between 0.01 and 1 (Table 2). Likewise, the neighborhood-level reliability of the estimated neighborhood scales varied between 0.21 and 0.98 - notice that a grand total of 20 observed ICCs and reliabilities were computed, since the sample used in this study consisted of 5 scales and 4 cities (Table 2).

Third, the scales were standardized in the range 0-5, with a higher score indicating a greater presence of the attribute in the neighborhood. For more details about the scales see tables 1 and 2.

Finally, Spearman's correlation coefficient was used to estimate the correlations between neighborhood scales. In general, the correlations between the scales were weak and moderate (COHEN, 1988), varying from 0.07 to 0.49 (in magnitude), except the correlation between the Access to Services and Access to Leisure Spaces that was 0.82 (data not shown).

Other covariates

Other covariates included in this study were individual characteristics and a social environment index at the neighborhood level, defined below.

The individual characteristics were: the city where the participant lived; length of residency in the respective neighborhood (years); age (years) and sex (female and male), both centered around the neighborhood means; education (primary school or less; high school degree, technical, some college; and university degree or higher); and the Wealth Index (scale ranges from 0-100, with a higher score denoting higher household wealth).

The Wealth Index is a comparable asset-based index that measures a household's long-term economic status, and that has been validated for use in low and middle-income countries. It was based on: a) ownership of consumer goods (refrigerator, TV, cell phone, car,

bicycle, cheap utensils and expensive utensils); b) access to basic services (electricity and water sources); and c) housing characteristics (floor material and numbers of bedrooms). Principal components analysis was used to develop the index (SMITS & STEENDIJK, 2015).

The social environment index at neighborhood level created for this study was computed using data from each of the countries' censuses for each city (Buenos Aires, Mexico City and Panama City's data is from 2010 and Lima's is from 2002). The z-scores of each of the following variables were calculated: a) proportion of households with piped water access inside the dwelling, harmonized according to the IPUMS; b) proportion of households connected to a public sewage network; c) proportion of households with more than 3 people per room (reversed); and d) proportion of the population aged 25 or older who completed primary education or above. The index was then defined as the mean of the z-scores, with a higher score indicating a "better" social environment (i.e. more access to sanitation, less illiteracy, etc.). All variables used to create this index were thoroughly harmonized by the SALURBAL Project's team in order to guarantee comparability across countries (QUISTBERG et al., 2019).

Statistical analysis

A descriptive analysis of the data was performed using frequency distributions, means and standard deviation (SD). To verify the association between poor self-rated health and the explanatory variables multilevel logistic regressions were used. These models had two levels: individual and neighborhood.

The first model included bivariate analyses for each of the neighborhood scales. Then, multivariate models were estimated: models two, three and four. The second model included each of the neighborhood scale adjusted for individual covariates (city, length of residency, age, sex, education, and Wealth Index). The third fitted model was each scale adjusted for individual covariates and the social environment index. Finally, the last model included all covariates (individual and contextual) and all the neighborhood scales together.

Multiplicative interactions between the variables included in the final model were tested. All multivariate models were adjusted for those covariates, since they were considered as possible confounders in the association between self-perceived neighborhood characteristics and self-rated health. The Akaike information criterion (AIC) was used to assess the appropriateness of model.

The entire analysis was conducted using Stata, version 13.0 (StataCorp LP, College Station, USA). The significance level was set at 5%, yielding 95% confidence intervals (95% CIs).

Results

The sample of the four cities included in this study was 3,606 participants; 18 were excluded due to lack of information regarding the outcome variable. The total number of neighborhoods analyzed in this study was 139 and the mean number of participants per neighborhood was 25, ranging from 1 to 178. Details of the sample characteristics are presented in Table 3. The overall proportion of poor self-rated health was 34.73% (95% CI: 33.17 - 36.29). Lima had the worst proportion of poor self-rated health among residents, followed, sequentially, by Mexico City, Panama City and Buenos Aires (Figure 1).

The study population consisted mostly of women (52.40%) and the mean age was 37.58 years (SD = 11.76). The majority of participants had a high school or a technical degree (49.01%) and the mean Wealth Index was 75.31 (SD = 15,78). These characteristics were also presented by city in Table 3.

Regarding contextual variables (Table 1), the Access to Services scale was the most positively evaluated, with a mean of 3.72 (SD = 0.82). On the other side, the Social Cohesion scale received the worst evaluation, with a mean of 1.89 (SD = 0.99), indicating the low frequency of this attribute in all the neighborhoods. The mean social environment index was 0.45 (SD = 0.51) (Table 3).

The four multilevel models were adjusted as shown in Table 4. Model 1, consisted of the bivariate analyses between self-rated health and the neighborhood scales, showed that people who lived in areas with more perceived Physical and Social Disorder were more likely to report poor health (OR: 1.28 per SD; 95% CI: 1.08 - 1.52 and OR: 1.25; 95%CI: 1.11 - 1.41, respectively); and people who lived in neighborhoods with greater perceived Social Cohesion were less likely to report poor health (OR: 0.80 per SD; 95% CI: 0.71 - 0.91). Model 2 included each of the neighborhood scales adjusted for the individual covariates. These results showed that people who lived in areas with more perceived Physical and Social Disorder were more likely to report poor health (OR: 1.25 per SD; 95% CI: 1.09 - 1.44 and OR: 1.13 per SD; 95% CI: 1.00 - 1.26, respectively). By adding the social environment index, model 3, the results showed that people who lived in areas with more perceived Physical Disorder were more likely to report poor health (OR: 1.22 per SD; 95% CI: 1.05 - 1.40). Finally, the full model showed that people who lived in areas with more perceived Physical

Disorder were more likely to report poor health (OR: 1.23 per SD; 95% CI: 1.03 - 1.47). None of the interactions terms between the variables tested were statistically significant.

Discussion

This study investigated how perceived neighborhood characteristics were associated with self-rated health among adults living in four Latin American cities (Buenos Aires, Lima, Mexico City and Panama City). The multilevel analysis showed that people living in areas with higher Physical Disorder, such as abandoned buildings, houses or lots; buildings, houses or lots taken illegally or invaded; landfills; poorly lit streets; drug purchase and use, were more likely to report poor health, even after controlling for individual and contextual-level characteristics.

These findings are in agreement with studies carried out in developed countries and other countries in Latin America that showed an association between perceived physical disorder and self-rated health (POORTINGA, DUNSTAN & FONE, 2007; PAMPALON et al., 2007; BJORNSTROM, RALSTON & KUHL, 2013; HÖFELMANN et al., 2015; RODRIGUES et al., 2015). Poortinga and colleagues found that neighborhood characteristics, such as litter and rubbish; vandalism; and discarded needles and syringes, had the strongest associations with poor health at the neighborhood level in Caerphilly county borough, Wales, United Kingdom (POORTINGA, DUNSTAN & FONE, 2007). In Brazil, researchers observed that perceived physical disorder, such as garbage; presence of graffiti; vacant lots; vandalism; street lighting, were associated with self-rated health (HÖFELMANN et al., 2015; RODRIGUES et al., 2015).

Physical disorder is related to the deterioration of urban landscape and it is, also, understood as a key to indicate that informal social control has been broken (BJORNSTROM, RALSTON & KUHL, 2013; RODRIGUES et al., 2015). Many individuals, that live in neighborhoods under such conditions, may find life threatening and forbidding, making it difficult the development of neighborhood trust, attachment, and participation in community life (BURCHFIELD, 2009; ROSS & MIROWSKY, 2001; DIEZ-ROUX, 2001). Within a disordered environment, many neighbors may be reluctant to venture outside, discouraging healthful outdoor activities, such as walking, and reducing their ability to form ties and observe positive neighborhood interaction (COHEN, INAGAMI & FINCH, 2008; ROSS & MIROWSKY, 2001). In addition, the literature demonstrates that perceived social cohesion is associated with self-rated health (BJORNSTROM, RALSTON & KUHL, 2013; RIOS, AIKEN & ZAUTRA, 2012).

Social cohesion is also a significant predictor of health (BJORNSTROM, RALSTON & KUHL, 2013; RIOS, AIKEN & ZAUTRA, 2012; OU et al., 2018; VERHAEGHE & TAMPUBOLON, 2012) and several potential mechanisms can explain this association. One potential mechanism is the enhancement of collective efficacy in neighborhoods with greater social cohesion (RIOS, AIKEN & ZAUTRA, 2012). Through the neighborhood context of mutual trust and shared values, neighborhood residents increase their expectations that together they can achieve common goals (SAMPSON, 2003). As such, healthy lifestyle behaviors are promoted through collective efforts to protect safe public spaces for activity, clean and safe housing, and availability of nutritional foods (RIOS, AIKEN & ZAUTRA, 2012). Furthermore, previous studies found that people living in areas with higher social cohesion were more likely to be physically active and this behavior is closely related to health (RODRIGUES et al., 2018; PABAYO et al., 2014; RUEGSEGGER & BOOTH, 2018). Finally, cohesive neighborhoods also foster a sense of community, which can be considered an affective component of social cohesion that positively impacts quality of life and may benefit self-rated health directly (RIOS, AIKEN & ZAUTRA, 2012).

However, this study did not find any association between self-rated health and neighborhood social cohesion. This result can be explained due the fact that, although social cohesion exists as both an emergent property at the neighborhood level as well as an individually measured characteristic that varies across each individual's unique lived experience, individually perceived cohesion emerges as a more important explanation of self-rated health than neighborhood-level social cohesion (BJORNSTROM, RALSTON & KUHL, 2013).

Regarding neighborhood disorder literature, results from other researches demonstrated an association between these contextual characteristics and several health-related outcomes and risky health-related behaviors among adults and old people, explained through the psychosocial processes of weakened social cohesion (VAZ et al., 2019; KEYES, 2012; ROSS & MIROWSKY, 2009; WEN, HAWKLEY & CACIOPPO, 2006; HILL, ROSS & ANGEL, 2005).

This study, also, did not find any association between self-rated health and other neighborhood scales, such as Social Disorder, Access to Services and Access to Leisure Spaces. On the other hand, studies that investigated the associations between these characteristics and other neighborhood characteristics (not investigated in this study) and self-rated health have found that quality of services, mobility, public facilities, safety from traffic, violence, presence of parks, street noise, income, overcrowding, and the water, sewage

network, electricity, and garbage collection services were all related to health status (VINCENS, EMMELIN & STAFSTRÖM, 2018; LIU et al., 2018; SANTOS et al., 2018; HÖFELMANN et al., 2015; RODRIGUES et al., 2015; PARRA et al., 2010), demonstrating that a favorable environment influences the adoption of healthy practices and behavior, which have a positive impact on health (LUCUMÍ, GROGAN-KAYLOR & ESPINOSA-GARCÍA, 2013).

It is important to highlight that this study used the perception scales to gauge the individuals' neighborhood. The advantage of the neighborhood perception approach is that it captures information on particular features of the physical and social environment that cannot be obtained from other sources such as systematic social observation. There are, however, disadvantages: it can be more expensive, more time-consuming to conduct, and introduces the possibility of information bias (SHAEFER-MCDANIEL et al., 2010; FRICHE et al., 2013).

Furthermore, other methodological issues should be considered when interpreting these results. Although the measure of self-rated health is an important indicator of population health and is routinely relied on in predicting health outcomes (FALK et al., 2017; SANCHEZ & VARGAS, 2016; GUIMARÃES et al., 2012), the question used in this study had only three answers' options: bad, fair and good (*mala, regular* and *buena* in Spanish language). Important to note that these options were less than the five responses used in other researches and this variability of the instrument makes difficult to compare the findings among the studies. Another issue is regarding the translation bias, since in the original CAF Survey the fair category was translated to *regular*. Translation problems induce some Spanish-language respondents to answer *regular* when they actually mean to rate their health in more positive terms than conveyed by the English term fair (VIRUELL-FUENTES et al., 2011). In addition, a previous study found that respondents provided with the term *regular* reported poorer health when compared to those who were given the alternative translation of *mas o menos* (SANCHEZ & VARGAS, 2016).

Also, regarding the limitations of the study, the cross-sectional design of it does not allow for the inference of temporality between exposures and outcomes and the results are susceptible to influence by behavioral, cultural and social factors due to the use of self-reported measures at the individual level. The dataset does not have variables on total income, either in household or individual level. Admittedly, collecting information on such variables are difficult in such a multinational survey and the irregularity of income per month of the studied population. To solve this issue an index that measures a household’s long-term economic status, as a proxy of income, was created to use as a covariate. Although the

individuals included and excluded in this study sample were comparable, they may be systematically different in unobserved ways that may be associated with the exposures and the outcome. Additionally, the discrepancy between census years (they range from as early as 2007 in Peru to 2010 in Argentina, Mexico and Panama) possibly making comparison between countries more difficult. Another issue is that the CAF Survey was not, originally, designed for a multilevel approach. Finally, another limitation is associated with the use of administrative units (the small-areas in this study) as proxies for neighborhoods. Identifying the correct geographical level of analysis is important, as misspecification may have implications for the study outcomes (DIEZ ROUX, 2001). Although it is not clear if administrative units match people's perceptions of the neighborhood, they are probably the best representatives of neighborhoods, as these are the smallest and most homogeneous geographical unit available in this study.

Conclusion

Despite limitations, this study advances into the literature regarding neighborhood characteristics and self-rated health in the Latin America context, since there is a lack of evidence about this theme. Using a relatively large sample in four Latin American cities, from four different countries, controlling for individual/household demographics and socioeconomics variables, self-reported neighborhood characteristics and social environment features, the results showed the relationship among physical disorder and self-rated health in cities that differ on environmental and socio-cultural factors, and urban planning, addressing the health inequalities in this region. Thus, more emphasis should be given to residents' perceptions of physical and social environmental features in the formulation of local public health policies (WILSON et al., 2004). However, future studies with a longitudinal design and/or using of objective measures of the environment, such as systematic social observation, are needed to corroborate these results.

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Table 1: Descriptive statistics for five scales on neighborhood conditions, CAF Survey, 2016-2017.

Scale	No. of Subjects	No. of items in scale	Range of score	Minimum score	Maximum score	Mean score	Standard deviation	Cronbach's alpha
Physical Disorder	3,311	5	0-5	0	5	2.08	0.73	0.64
Social Disorder	3,474	5	0-5	0	5	2.10	1.06	0.76
Access to Services	3,342	5	0-5	0	5	3.72	0.82	0.70
Access to Leisure Spaces	2,926	3	0-5	0	5	2.81	0.93	0.65
Social Cohesion	3,301	9	0-5	0	5	1.89	0.99	0.74

Nº = number

Table 2: Psychometric and ecometric properties of neighborhood scales by city, CAF Survey, 2016-2017.

Scale / City	Buenos Aires		Lima		Mexico City		Panama City	
	ICC	**Reliability**	**ICC**	**Reliability**	**ICC**	**Reliability**	**ICC**	**Reliability**
Physical Disorder	0.16	0.87	0.15	0.82	0.30	0.90	0.01	0.21
Social Disorder	0.14	0.86	0.18	0.86	0.28	0.90	0.13	0.82
Access to Services	0.22	0.91	0.35	0.92	0.17	0.82	0.04	0.57
Access to Leisure Spaces	1.00	0.96	1.00	0.95	1.00	0.98	0.39	0.90
Social Cohesion	1.00	0.23	1.00	0.74	1.00	0.85	0.99	0.38

ICC = intra-neighborhood correlation coefficients

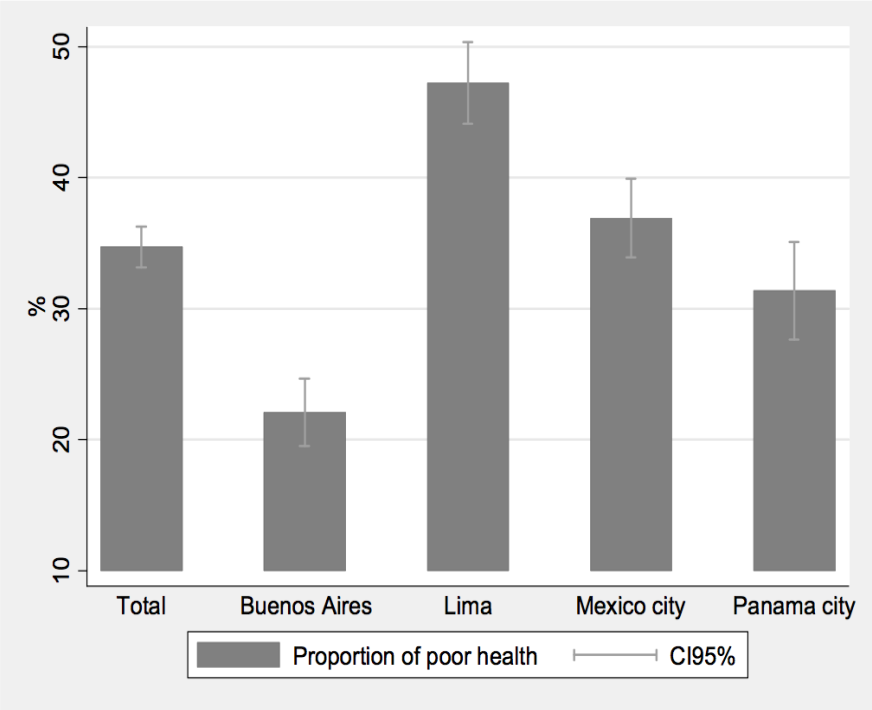

Figure 1: Proportion of poor self-rated health and 95% confidence interval: total and by city, CAF Survey, 2016-2017.

Table 3: Sample characteristics, participants´ characteristics and contextual covariate characteristic, CAF Survey, 2016-2017.

VARIABLES	TOTAL	Buenos Aires	Lima	Mexico City	Panama City
Sample characteristics					
Number of participants	3,588	1,000	995	997	596
Number of neighborhood	139	41	34	26	38
Participantes by neighborhood					
Mean	25.81	24.39	29.26	38.35	15.68
Standard deviation	25.60	20.26	23.22	40.03	14.39
Minimum	1	1	5	1	1
Maximum	178	130	106	178	84
Participants characteristics					
Age m(SD)	37.58 (11.76)	38.26 (11.73)	36.33 (11.58)	37.95 (11.66)	37.91 (12.12)
Sex n(%)					
Male	1,708 (47.60)	478 (47.80)	47.84 (47.84)	461 (46.24)	293 (49.16)
Female	1,880 (52.40)	522 (52.20)	519 (52.16)	536 (53.76)	303 (50.84)
Education n(%)[a]					
Primary school or less	1,472 (41.06)	501 (50.10)	258 (25.93)	527 (53.02)	186 (31.21)
High school	1,757 (49.01)	446 (44.60)	639 (64.22)	383 (38.53)	289 (48.49)
University degree or more	356 (9.93)	53 (5.30)	98 (9.85)	84 (8.45)	121 (20.30)
Wealth Index m(SD)[b]	75.31 (15.78)	80.88 (12.98)	70.97 (16.63)	74.15 (15.88)	75.13 (15.73)
Length of residency m(SD)[c]	18.39 (14.33)	17.20 (14.20)	18.01 (13.85)	21.50 (14.47)	15.83 (14.25)
Contextual covariate					
Social Environment Index m(SD)	0.45 (0.51)	0.34 (0.47)	0.18 (0.52)	0.64 (0.30)	0.58 (0.54)

m = mean; SD = standard deviation

[a]3 missing; [b]178 missing; [c]2 missing;

Table 4: Multilevel analyses between poor self-rated health and neighborhood scales, CAF Survey, 2016-2017.

VARIABLES	Model 1a			Model 2b			Model 3c			Model 4d	
	OR (95%CI)	p-value	AIC	OR (95%CI)	p-value	AIC	OR (95%CI)	p-value	AIC	OR (95%CI)	p-value
Physical Disorder	1.28 (1.08 - 1.52)	0.005	4,520.79	1.25 (1.09 - 1.44)	0.002	3,936.82	1.22 (1.05 - 1.40)	0.008	3,937.41	1.23 (1.03 - 1.47)	0.022
Social Disorder	1.25 (1.11 - 1.41)	<0.001	4,515.79	1.13 (1.00 - 1.26)	0.043	3,942.90	1.11 (0.99 - 1.24)	0.074	3,941.62	1.01 (0.88 - 1.16)	0.868
Access to Services	0.96 (0.82 - 1.12)	0.614	4,528.48	1.12 (0.94 - 1.34)	0.193	3,955.51	1.19 (1.00 - 1.43)	0.053	3,952.31	1.22 (0.97 - 1.52)	0.087
Access to Leisure Spaces	0.88 (0.76 - 1.01)	0.066	4,525.34	0.98 (0.84 - 1.15)	0.822	3,957.15	1.03 (0.88 - 1.21)	0.687	3,955.86	1.03 (0.83 - 1.26)	0.807
Social Cohesion	0.80 (0.71 - 0.91)	<0.001	4,516.62	0.92 (0.80 - 1.06)	0.242	3,955.79	0.93 (0.81 - 1.06)	0.282	3,954.83	0.93 (0.81 - 1.06)	0.268

SD = standard deviation; AIC = Akaike information criterion

N individual level = 3,405; N contextual level = 139

Null model: AIC = 4,526.73

[a]Bivariate analyses between poor self-rated health and neighborhood scales.

[b]Model adjusted for individual covariates (city, length of residency, age, gender, education, and Wealth Index).

[c]Model adjusted for individual covariates and the contextual covariate (social environment index).

[d]Model adjusted for individual covariates, contextual covariate and all neighborhood scales. Full model: AIC = 3,950.71

8 Considerações finais

Os impactos do entorno físico e social do local de moradia nos eventos relacionados à saúde, como a satisfação com a vida e a autoavaliação de saúde, é um tema cada vez mais investigado no mundo inteiro e vem ganhando atenção especial nos países da América Latina, região onde 80% das pessoas vivem em cidades, considerada a mais desigual do mundo.

Os resultados neste trabalho encontrados fornecem informações epidemiológicas importantes, demonstrando que o ambiente físico no qual as pessoas vivem está associado à satisfação com a vida em idosos e à autoavaliação de saúde em adultos, residentes em centros urbanos de cinco países da América Latina. Mais especificamente, os resultados do Artigo 1 mostraram uma maior prevalência de satisfação com a vida em idosos com maior renda, maior participação religiosa, praticantes de atividade física e autoavaliação de saúde boa/muito boa. Ademais, foi observado uma menor prevalência de satisfação com a vida entre aqueles que moravam em vizinhana com maior desordem física, mesmo após ajustes para características individuais e outras características contextuais. Os achados do Artigo 2 mostraram que a autoavaliação de saúde ruim esteve positivamente associada à uma percepção de desordem física, mesmo após ajustes para características individuais e contextuais.

É importante enfatizar que a estratégia análica usada em ambos estudos, a análise multinível, é uma das mais adequada para se investigar a inflência do ambiente na saúde ou nos eventos relacionados à saúde. Além disso, esta Tese usou abordagens diferentes para se medir o ambiente: no primeiro artigo usou-se a OSS, que tem como vantagem a obtenção de informações e medidas que independem da percepção individual e permitem a cobertura de maiores áreas; e no segundo artigo usou-se a percepção dos indivíduos, que tem como vantagem a informação peculiar de aspectos da organização e estrutura da vizinhança[2]. Por fim, é importante destacar o ineditismo dos dois estudos apresentados: o Artigo 1 por ser o primeiro estudo na América Latina sobre o tema; e o Artigo 2 por usar uma amostra relativamente grande, com dados harmonizados para permitir maior comparabilidade entre as cidades.

Desta forma, esses achados sugerem que é necessário a (re)formulação e/ou (re)orietação de políticas públicas intersetoriais que melhorem as características do ambiente no qual as pessoas vivem, especialemtne com o objetivo de reduzir a desordem fisica, afim de melhorar a satisfação com a vida e a autoavaliação de saúde de adultos e idosos que vivem em cidades da América Latina. Neste sentido, por meio dessas políticas públicas intersetoriais,

será possível melhorar a saúde e diminuir as iniquidades em saúde dos indivíduos que vivem nesta região.

ANEXO 1

Artigo 1

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RESEARCH ARTICLE Open Access

A multilevel model of life satisfaction among old people: individual characteristics and neighborhood physical disorder

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Abstract

Background: Considering the lack of studies that examine built environmental factors associated with life satisfaction among old people in developing countries, particularly those focused on Brazil, the aim of this study was to estimate the prevalence of life satisfaction among old adults residents in a Brazilian urban center and to investigate its association with individual characteristics and objective measures of the built environment.

Methods: A household survey ($N = 832$) in Belo Horizonte, Minas Gerais, Brazil (2008–2009) and a Systematic Social Observation (SSO) was used in this study. Life satisfaction was assessed through Self-Anchoring Ladder Scale, developed by Cantril, in 1965. Participants' answers were categorized as satisfied (rungs 6–10) and dissatisfied (rungs 0–5). A Multilevel Poisson regression analysis with robust variance was performed.

Results: The prevalence of satisfaction with life was approximately 82%. Higher prevalence of life satisfaction was significantly associated with old people who reported higher incomes, higher religious participation, who practice physical activity and who perceive their health as good and very good. In contextual level, results showed that when the contextual features were adjusted separately by the individual characteristics they were no longer significant. The results also showed a lower prevalence of life satisfaction among those living in neighborhoods with higher physical disorder, even after adjusting for individual and other contextual characteristics.

Conclusions: The present findings suggest that life satisfaction should be assessed whenever evaluating urban redevelopment programs designed to improve neighborhood characteristics, reducing physical disorder, especially among old adults.

Keywords: Aged, Built environment, Urban health, Multilevel analysis

Background

Life satisfaction is a global assessment of one's life [1, 2]. According to the Organization for Economic Cooperation and Development [3] life satisfaction "measures how people evaluate their lives as a whole rather than their current feelings". This term is often used interchangeably with happiness and subjective wellbeing in many studies around the world [4].

Life satisfaction closely relates to health [5], as an important predictor of mortality, morbidity, depression, and health status over the life course [6–9]. This link is especially pronounced in older people because the aging period is frequently accompanied by illnesses, disabilities, and dependency for care and support [5, 10]. In addition, life satisfaction is considered an essential component of successful aging. There are ongoing research efforts to identify its associated factors that may help to reach the ideal aging model [11].

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In old population, studies carried out in developed countries have identified some individual-level factors related to life satisfaction. They are demographic and socio-economic factors, lifestyle behavior, health status, social activities and connections. Regarding contextual-level factors, studies tend to be exclusively focused on the role of the social environment, such as social support and social interaction [5, 12–16].

Recently, besides social environment, ecological theories of aging suggest that as people age and their functional capacity declines, the built (or physical) environment in which they live holds an emerging role in their life satisfaction [17, 18]. Urban built environment for senior residents may be a relevant promising strategy for improving old people's life satisfaction, with subsequent successful aging in this setting [19]. However, neither built environment nor life satisfaction in this population has been largely examined [20], especially in developing countries.

Considering the lack of studies that examine built environmental factors associated with life satisfaction among old populations in urban Latin America, particularly those focused on Brazil, the aim of this study was to estimate the prevalence of life satisfaction among old adults residents in a Brazilian urban center and to investigate its association with individual characteristics and objective measures of the built environment.

Methods

Study design

Data were obtained from a multi-method epidemiological study that included a household survey, called BH Health Study (Saúde em Beagá, in Portuguese language) and an objective environmental characterization using Systematic Social Observation (SSO), both carried out by the Observatory for Urban Health in Belo Horizonte (OSUBH) at the Federal University of Minas Gerais. Two of the nine health districts of Belo Horizonte (Oeste and Barreiro) were included in this study, which together account for 24% of the total of residents of the municipality [21]. Health districts comprise a geographical area that includes a population with epidemiological and social characteristics, their needs, and the health resources to attend it. These health districts were selected due to field research logistics and their internal heterogeneity in terms of select demographic, socioeconomic, and health indicators [22].

The BH Health Study (2008–9), included adults residing in households, through a probabilistic sampling design, stratified and clustered, in three stages: census tract ($n = 149$); household ($n = 4048$); and a randomly selected adult resident (18 years or older) within eligible households, with the total of 4048 participants. Individuals aged 60 years or older ($n = 834$) were included in the present study analysis. Details on the survey have been published previously [22].

SSO was used to assess and quantify the built environmental characteristics associated with health-related events of the studied neighborhood. Observations were conducted between April and June of 2011 in the same geographical area of the BH Health Study by independent observers. The units of analysis were street segments within a 100- m range, in any direction, from the households of the survey's participants. Segments in the same census sector were considered the neighborhood corresponding to that census tract. The final sample included 1295 segments. Instrument reliability was evaluated in a previous study and was adequate for the observation of characteristics with greater temporal stability, mainly regarding services, pedestrian environment, and safety [23]. Details on the method have been published previously [23, 24].

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of Federal University of Minas Gerais (protocol n. ETIC 253/06) and the Ethics Research Committee of the Department of Municipal Health (073.2008).

Outcome

The response variable of life satisfaction was measured using the Self-Anchoring Ladder Scale (SALS), developed by Cantril [25]. This instrument consists of a scale from 0 to 10 points, represented schematically by a ladder, in which the lowest rung indicates the lowest satisfaction with life and the highest rung the highest. Participants were asked to answer the following question: "In relation to satisfaction with your current life, in which rung are you TODAY?" In order to carry out the analysis, participants' answers were categorized as satisfied (rungs 6–10) and dissatisfied (rungs 0–5), as in a previous study [26].

Explanatory variables

Individual and contextual level explanatory variables were used according to the source of information (survey or SSO). Individual variables were selected considering the literature review [5, 14, 15, 27–29] and they included demographic and socio-economic variables, participation in religious activities, lifestyle and health status.

Demographic and socio-economic variables were: age (years), sex (female and male), marital status (with partner; widower; and without partner), schooling (0 to 4; 5 to 8; 9 to 11; and 12 or more years of formal education), employment situation (never worked; currently working; and has worked before), and family income as a multiple of the minimum monthly wage (< 2 minimum monthly wages; ≥ 2 minimum monthly wages). Religion participation was assessed by the frequency of participation in religious services (none; ≤ twice a month; > twice a

month). Lifestyle variables were: physical activity (yes or no), assessed by the question: "Do you practice (or have you practiced) any physical activity in the past 3 months?" [30]; smoking habits (non-smoker; former smoker; and current smoker), constructed from the following questions: "In your life, have you ever smoked cigarettes?" and "Do you currently smoke cigarettes?" [30]; and alcohol consumption (yes or no), assessed by the question: "Do you drink alcoholic beverages?" [30].

Finally, health status variables were: health services use (yes or no), assessed by the question: "Did you seek services or any professional appointment for your health care in the past 30 days?"; morbidity (none; one; and two or more illness), assessed by the question: "At any time, has a doctor or other health care professional ever said that you have any of the illness listed below: hypertension, high cholesterol, diabetes, asthma, arthritis, arthrosis, rheumatism, osteoporosis, chronic kidney disease, depression, migraines, epilepsy, tuberculosis, cancer, heart disease, lung disease, chronic digestive disease (ulcer/gastritis), or mental illness?"; and self-rated health (very good/good; fair; and poor/very poor), assessed by the question: "In general, would you say that your health is: very good, good, fair, poor, or very poor?"

Contextual level variables were obtained from composite indicators, constructed using a principal component analysis via the covariance matrix, which was based on the information collected through SSO and aggregated by census tract. First, simple indicators were structured and then these indicators were grouped in domains from which composite indicators were respectively developed. The internal consistency of the proposed domains was considered acceptable, with Cronbach's alpha ranging from 0.591 to 0.820. Details on the indicator development process have been published recently [24].

This present study included the following SSO domains: *Street conditions and traffic infrastructure items*; *Walking environment*; *Accessibility*; *Spaces for physical activity and leisure*; *Physical disorder*; *Safety*; as well as the presence of Services, subdivided in *Food, health and recreational services*; *Garbage collection and school services* and *Automotive mechanics and repair services*. The *Street conditions and traffic infrastructure items* scale was developed based on the evaluation of the following items: public transport signage; prohibited parking signs; and presence of flowerbeds, speed bumps, radars, and traffic lights. The *Walking environment* scale included evaluations of items such as: sidewalk paving; trees for shading; sidewalk width at the smaller end; and favorable perception for walking. The *Accessibility* domain was developed based on the evaluation of the items: access ramps or tactile floors; and pedestrian traffic items (grids, crosswalks, walkways). The *Spaces for physical activity and leisure* scale included items regarding the evaluation and presence of spaces for physical activity; of parks and plazas; and favorable perceptions of the environment for physical activity. The *Physical disorder* domain was composed by the following items: presence of trash (needles, cigarettes, cans and condoms) and graffiti in public urban equipments/facilities. The *Safety* scale was developed from the variables: public lighting; policing; and safety items in buildings/properties (either observed by the presence of the item or by a safety note informing the presence of dogs, alarms, wires, gate/pointed walls, windows with grids, electric fences, doormen, glass shards, and camera surveilance). The items of the *Food, health and recreational services* scale referred to the presence of: vendors of fresh and locally-grown food, convenience stores, vegetable vendors, private health care services, and public or private recreation facilities. The items of the *Garbage collection and school services* scale referred to the presence of: public or private garbage collectors; and elementary and high schools. Last, the items of the *Automotive mechanics and repair services* scale referred to the presence of: mechanical workshops and automotive repair centers. The scales range from 0 to 5, and a higher domain score denotes a greater presence of the attribute in the neighborhood.

Statistical analysis

Descriptive analysis was performed through frequency distributions, averages and standard deviation (SD). The prevalence of life satisfaction at a 95% confidence interval (95%CI) was estimated for the population sample and for each of the individual variables. The means and SD of the contextual variables (*Street conditions and traffic infrastructure items*; *Walking environment*; *Accessibility*; *Spaces for physical activity and leisure*; *Physical disorder*; *Safety*; *Food, health and recreational services*; *Garbage collection services and school*; and *Automotive mechanics and repair services*) were calculated and stratified by the satisfied and dissatisfied condition. All the contextual variables were considered protective factors for satisfaction with life, with the exception of the Physical Disorder considered risk factor.

To verify the association between life satisfaction and explanatory variables in the bivariate and multivariate analysis, the multilevel Poisson regression with robust variance was used. Robust Poisson regression was used because the outcome (Satisfied) had a prevalence of greater than 10%, causing the odds ratio to deviate from the true risk ratio [31]. Initially, a null model was adjusted to evaluate the contextual effects. Then, bivariate models were adjusted for individual and contextual variables. Finally, multivariate models were adjusted. The first one included individual variables whose p-value was equal to or smaller than 0.20 in the bivariate analysis.

For this model, the stepwise-backward procedure was used to select the variable to retain ($p \leq 0.05$), except for age and sex, used as adjustment variables. Then, by adding the individual variables that remained in the multivariate model, one model was adjusted for each contextual variable with a p-value ≤0.20 in the bivariate analysis. The last model was adjusted with all individual and contextual variables selected in the previous steps. In this step, multiplicative interactions between the contextual variables included in the multivariate model were tested. All multilevel analyses were performed using a fixed effects model with a random intercept and log function to obtain the prevalence ratio (PR) and 95%CI measures. The Akaike information criterion (AIC) was used to assess the appropriateness of model. Finally, the Spearman coefficient was used to estimate the correlations between contextual variables.

The software Stata, version 12.0 (StataCorp LP, College Station, USA) was used. All analyses were carried out taking the complex sample into account. Significance was set at 5%, with a 95%CI.

Results

Of the total 834 study participants, two were excluded due to lack of information on the outcome variable. The total number of census tracts analyzed in this study was 146, since one census tract lacked old adults residents from which to select participants. The mean number of old participants per census tract was 6, ranging from 1 to 15.

The prevalence of satisfied individuals was 81.95% (95% CI: 78.66–85.24); 56.41% were women and the mean age was 69.29 (SD = 7.68). About 61% of old people reported to live with a partner, 51% had from 0 to 4 years of formal education; 77% reported having a family income of ≥2 minimum monthly wages. Bivariate analysis showed a positive dose-response between schooling and life satisfaction; that is, as the number of years of school education increases, there is an increase in the prevalence of old people who are satisfied with life. The prevalence of life satisfaction was higher among old people with a family income of ≥2 minimum monthly wages, those who practiced physical activity, those who never smoked and, those who perceived their health as good/very good or fair. The variables age, sex, marital status, employment situation, frequency of participation in religious services, alcohol consumption, health service use, and morbidity were not associated with life satisfaction in old people (Table 1).

Regarding contextual characteristics (Table 2), the *Walking environment* scale was the most positively evaluated, with a mean of 2.95 (SD = 0.92). Contrarily, the *Spaces for physical activity and leisure* (mean = 0.65; SD = 0.94) and *Food, health and recreational services* (mean = 0.65; SD = 0.43) were the scales with the lowest evaluation, indicating the low frequency of these attributes in the neighborhood. Bivariate analysis showed higher prevalence of life satisfaction reported among older adults living in places with greater presence of items of *Walking environment*; *Safety*; and *Garbage collectors and school services*. *Street conditions and traffic infrastructure items*; *Accessibility*; *Space for physical activity and leisure*; *Physical disorder*; *Food, health and recreational services*; and *Automotive mechanics and repair services* scales were not associated with life satisfaction in the univariate analysis in this population.

For the multivariate analysis six models were estimated as shown in Table 3. Model 1, consisting of only individual-level variables, suggested a higher prevalence of life satisfaction among old people with a family income of at least twice the minimum monthly wage (PR: 1.13; 95% CI: 1.02–1.26), among those who participated in religious services more than twice a month (PR: 1.20, 95% CI: 1.02–1.42), among those who practiced physical activity (PR: 1.12, 95% CI: 1.02–1.22), and among those who perceived their health as good/very good (RP: 1.23, 95% CI: 1.03–1.46). After adjustments for individual variables in Model 1, none of the contextual scales for *Walking environment*; *Physical disorder*; Safety; and *Garbage collection and school services* scales (models 2 to 5) were significantly associated with life satisfaction. However, significant associations were noted for the *Physical disorder* scale, in model 6 (PR: 0.94, 95% CI: 0.88–0.99). This model shows that old people living in census tracts with greater physical disorder reported less satisfaction with life. Finally, none of the interactions terms between the contextual variables tested were statistically significant.

Table 4 presents the correlation matrix between the scales included in the multivariate model. There were a significant and positive correlation between: 1. *Walking environment* and *Safety* scales; 2. *Walking environment, Garbage collection and school services* scales; 3. *Physical Disorder* and *Safety* scales; 4. *Safety, Garbage collection and school services* scales. A significant and negative correlation encountered were between: 1. *Walking environment, Physical Disorder* scales; and 2. *Physical Disorder, Garbage collection and school services* scales.

Also, we estimated multinomial and proportional odds models using life satisfaction on an ordinal scale. However, as the original variable had a very asymmetric skewed distribution to the right, these models failed to be adequately adjusted.

Discussion

This study aimed to investigate the association of life satisfaction with individual characteristics and objective measures of the built environment among old population living in Belo Horizonte, Brazil. The multilevel analyses showed higher prevalence of life satisfaction in old

Table 1 Univariate analysis of life satisfaction and individual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008–2011

Variables	TotaL	life satisfaction		PR (95% CI)	*p*-value
	N = 832	Satisfied	Dissatisfied		
Age m(SD)	69.29 (7.68)	69.54 (7.74)	68.18 (7.29)	1.02 (0.99–1.05)[1]	0.138
Sex (%)					
Male	43.59	80.52	19.48	0.97 (0.89–1.05)	0.446
Female	56.41	83.05	16.95	1.00	
Marital status (%)					
With partner	61.11	81.81	18.19	1.01 (0.90–1.14)	0.814
Widower	23.19	83.19	16.81	1.03 (0.90–1.18)	0.653
Without partner	15.7	80.66	19.34	1.00	
Schooling (%)[a]					
12 or more years	16.2	89.19	10.81	1.15 (1.04–1.27)	0.006
9 to 11 years	19.58	87.14	12.86	1.13 (1.02–1.25)	0.025
5 to 8 years	13.27	82.79	17.21	1.07 (0.93–1.27)	0.339
0 to 4 years	50.95	77.43	22.57	1.00	
Employment situation (%)					
Currently working	22.84	77.76	22.24	0.90 (0.80–1.02)	0.296
Has worked before	62.26	82.46	17.54	0.96 (0.86–1.06)	0.404
Never worked	14.91	86.20	13.80	1.00	
Family income (%)[b]					
≥ 2 mw	77.21	84.50	15.50	1.15 (1.04–1.28)	0.007
< 2 mw	22.79	73.21	26.79	1.00	
Religion participation (%)[a]					
≤ 2 x/month	29.83	80.17	19.83	1.17 (0.99–1.38)	0.067
> 2 x/month	58.54	84.74	15.26	1.11 (0.93–1.32)	0.258
None	11.63	72.41	27.59	1.00	
Physical activity (%)					
Yes	57.86	87.84	12.16	1.13 (1.03–1.24)	0.010
No	42.14	77.66	22.34	1.00	
Smoking habits (%)					
Non-smoker	51.72	84.30	15.7	1.20 (1.01–1.44)	0.041
Former smoker	37.96	82.00	18.00	1.17 (0.98–1.40)	0.080
Current smoker	10.32	69.97	30.03	1.00	
Alcohol consumption (%)					
Yes	29.51	82.22	17.78	1.00 (0.92–1.10)	0.921
No	70.49	81.83	18.17	1.00	
Health service use (%)					
Yes	37.31	79.93	20.07	0.96 (0.88–1.05)	0.395
No	62.69	83.15	16.85	1.00	
Morbidity (%)					
None	9.7	89.28	10.72	1.11 (0.99–1.24)	0.085
One	18.38	83.29	16.71	1.03 (0.91–1.17)	0.606
Two or more	71.92	80.62	19.38	1.00	
Self-rated health (%)					

Table 1 Univariate analysis of life satisfaction and individual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008–2011 *(Continued)*

Variables	TotaL	life satisfaction		PR (95% CI)	*p*-value
	N = 832	Satisfied	Dissatisfied		
Good/Very good	50.86	85.59	14.41	1.29 (1.07–1.55)	0.007
Fair	36.6	82.20	17.80	1.24 (1.01–1.51)	0.033
Poor/Very poor	12.46	66.31	33.69	1.00	

m Mean, *SD* standard deviation
[a]1 missing; [b]30 missing; [1]For an increase of 5 years in age

people with higher incomes, higher religious participation, who practiced physical activity and who had good/very good self-rated health. In addition, we observed that when the contextual characteristics were adjusted separately by the individual characteristics they were not significant. We also observed a lower prevalence of life satisfaction among those who lived in neighborhoods with high physical disorder levels, after adjusting for individual and other contextual characteristics such as walking environment, safety, and presence of garbage collection and school services.

Given the main objective of this paper, we will first discuss the context-level variables and then the individual-level variables. A recent study, carried out among inhabitants of urban areas in five different European countries, corroborates with our finding. This study showed that individuals who perceived their neighborhood as having lower physical disorder - for example: free from rubbish, litter and graffiti - were more likely to be satisfied with their lives [32]. No studies that investigated the association between life satisfaction and objective measures of physical disorder were found.

Neighborhood physical disorder is understood as a key to indicate that informal social control has been broken [33]. This characteristic may have deep effects on the development of neighborhood trust, attachment, and participation in community life [34–36]. In the Brazilian context, neighborhood with higher social vulnerability has higher physical disorder [24]. Within a disordered environment, many neighbors, especially older adults, may be reluctant to venture outside, reducing their ability to form ties and observe positive neighborhood interaction [37]. Additionally, the literature regarding life satisfaction and social environment among old people demonstrates that perceived social cohesion and social interaction are positively associated with life satisfaction [16, 38, 39].

Social cohesion and social interaction may influence life satisfaction of old people in several ways. First, social cohesion positively impacts the strength of relationships and social interactions, as well as collective attachment to the neighborhood, and is thus expected to enhance individuals' life satisfactions [40]. Second, elders living in more cohesive communities may receive more instrumental and effective support [38], which are resources that can contribute to life satisfaction [41, 42]. Third, neighborhood social cohesion and social interaction may promote both physical activity [43] and greater religious participation among elders. Previous studies as well as this study show that religious participation and physical activity are positively associated with life satisfaction [14, 28], as will be discussed below.

Furthermore, previous studies report the association between objective measures of neighborhood physical

Table 2 Univariate analysis of life satisfaction and contextual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008–2011

Variables	TotaL	Life Satisfaction		PR (95% CI)	*p*-value
	N = 146	Satisfied	Dissatisfied		
Street conditions and traffic infrastructure items m(SD)	0.81 (0.89)	0.93 (0.89)	0.90 (0.87)	1.01 (0.97–1.05)	0.762
Walking environment m(SD)	2.76 (1.04)	2.98 (0.93)	2.78 (0.82)	1.05 (1.01–1.08)	0.008
Accessibility m(SD)	1.13 (0.74)	1.26 (0.90)	1.26 (0.92)	1.00 (0.96–1.04)	0.980
Spaces for physical activity and leisure m(SD)	0.65 (0.99)	0.65 (0.96)	0.58 (0.88)	1.01 (0.98–1.05)	0.423
Physical disorder m(SD)	1.86 (0.77)	1.72 (0.72)	1.86 (0.79)	0.95 (0.90–1.00)	0.082
Safety m(SD)	1.46 (1.06)	1.75 (1.12)	1.50 (1.07)	1.04 (1.00–1.07)	0.026
Food, health and recreational services m(SD)	0.63 (0.47)	0.65 (0.41)	0.66 (0.49)	0.99 (0.92–1.07)	0.775
Garbage collection and school services m(SD)	1.26 (0.81)	1.30 (0.77)	1.16 (0.70)	1.04 (1.01–1.08)	0.020
Automotive mechanics and repair services m(SD)	2.26 (0.58)	2.28 (0.64)	2.26 (0.55)	1.01 (0.96–1.06)	0.680

m Mean, *SD* standard deviation

Table 3 Multilevel models of life satisfaction, individual and contextual characteristics among old people. The BH Health Study, Belo Horizonte, Minas Gerais State, Brazil, 2008-2011

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	PR (95% CI)	*p*-value	PR (95% CI)	*p*-value	PR (95% CI)	*p*-value	PR (95% CI)	*p*-value	PR (95% CI)	*p*-value	PR (95% CI)	*p*-value
Individual characteristics												
Age	1.03 (1.01–1.06)[1]	0.013	1.03 (1.01–1.06)[1]	0.015	1.03 (1.01–1.06)[1]	0.010	1.03 (1.01–1.06)[1]	0.019	1.03 (1.01–1.06)[1]	0.014	1.03 (1.01–1.06)[1]	0.015
Sex												
Male	0.94 (0.87–1.02)	0.170	0.94 (0.87–1.02)	0.165	0.94 (0.87–1.02)	0.152	0.95 (0.87–1.03)	0.193	0.95 (0.87–1.03)	0.176	0.95 (0.87–1.03)	0.202
Female	1.00		1.00		1.00		1.00		1.00		1.00	
Family income												
≥ 2 mw	1.13 (1.02–1.26)	0.024	1.12 (1.00–1-26)	0.051	1.13 (1.01–1.26)	0.028	1.12 (1.01–1.26)	0.048	1.13 (1.01–1.26)	0.034	1.11 (0.98–1.25)	0.088
< 2 mw	1.00		1.00		1.00		1.00		1.00		1.00	
Religion participation												
> 2 x/month	1.20 (1.02–1.42)	0.027	1.20 (1.02–1.42)	0.027	1.20 (1.02–1.43)	0.025	1.21 (1.02–1.42)	0.026	1.20 (1.02–1.42)	0.019	1.21 (1.03–1.44)	0.022
≤ 2 x/month	1.14 (0.95–1.37)	0.147	1.14 (0.95–1.37)	0.153	1.14 (0.95–1.37)	0.152	1.15 (0.96–1.37)	0.141	1.14 (0.95–1.37)	0.149	1.15 (0.95–1.38)	0.143
None	1.00		1.00		1.00		1.00		1.00		1.00	
Physical activity												
Yes	1.12 (1.02–1.22)	0.019	1.11 (1.02–1.22)	0.022	1.11 (1.02–1.22)	0.018	1.11 (1.02–1.22)	0.020	1.11 (1.02–1.22)	0.021	1.11 (1.01–1.21)	0.023
No	1.00		1.00		1.00		1.00		1.00		1.00	
Self-rated health												
Good/Very good	1.23 (1.03–1.46)	0.006	1.22 (1.03–1.45)	0.021	1.23 (1.04–1.46)	0.018	1.22 (1.03–1.46)	0.025	1.23 (1.03–1.46)	0.020	1.21 (1.02–1.44)	0.026
Fair	1.20 (1.00–1.45)	0.051	1.20 (1.00–1.45)	0.055	1.20 (1.00–1.45)	0.047	1.20 (0.99–1.45)	0.056	1.20 (1.00–1.45)	0.052*	1.20 (1.00–1.44)	0.052
Poor/Very poor	1.00		1.00		1.00		1.00		1.00		1.00	
Contextual characteristics												
Walking environment			1.02 (0.98–1.06)	0.444							0.99 (0.95–1.04)	0.741
Physical disorder					0.95 (0.90–1.01)	0.092					0.94 (0.88–0.99)	0.048
Safety							1.01 (0.98–1.05)	0.448			1.03 (0.98–1.07)	0.209
Garbage collection and schools services									1.02 (0.98–1.06)	0.418	1.01 (0.97–1.04)	0.761
Random effects												
AIC	1579.70		1581.93		1580.88		1581.6		1581.61		1586.47	

mw minimum wages, *AIC* Akaike information criterion
N individual level = 801; N contextual level = 146; [1]For an increase of 5 years in age
Null model: AIC = 1639.54

Table 4 Correlation matrix between the scales

Scales	Walking environment	Physical Disorder	Safety	Garbage collection and School services
Walking environment	1			
Physical Disorder	−0.12*	1		
Safety	0.54*	0.18*	1	
Garbage collection and School services	0.50*	−0.09**	0.34*	1

*P ≤ 0.01; **P ≤ 0.05

disorder or self-perceived neighborhood physical disorder, and several health-related outcomes and risky health-related behaviors in adults [44–49], explained through the psychosocial processes of perceived danger and weakened social cohesion and social interaction [33].

When each contextual characteristic is adjusted for individual characteristics (models 2 to 5), they are not associated with life satisfaction. This could perhaps be explained due to the fact that the individual characteristics play a more important role in life satisfaction in the old population. In addition, the main results observed in this study (model 6) can be explained due the fact that the scales are correlated with each other.

This study did not find any association between life satisfaction and other built environment characteristics. Studies that investigated the associations between objectively assessed and perceived built environment characteristics and life satisfaction have found that living in neighborhoods with a higher percentage of streets with well-maintained green areas and residential buildings in good conditions, more water and green space or public parks, and with easy access to convenient public transportation and to cultural and leisure amenities was associated with life satisfaction [4, 16, 32, 50]. However, these studies are related to a total adult population and are not specific to older adults.

Age was found to be positively associated with higher prevalence of satisfaction with life. This result is in agreement with other studies [5, 51, 52], and different authors have postulated that this association could be happening through a socioemotional selectivity theory, suggesting that as people age, they accumulate emotional wisdom that leads to the selection of more emotionally satisfying events, friendships, and experiences [5, 53].

Also, at the individual level, we found that higher income was associated with higher prevalence of life satisfaction, corroborating the results of studies focused on non-old and old population. A study conducted by the Gallup Organization of more than 450,000 non-old adult residents in the United States demonstrated that low income was associated with low life satisfaction [54]. A research project carried out in Turkey analyzed data from 1990 to 2013 and the results showed that the prevalence of dissatisfaction was higher for low-income old people. This study also showed that in wave 2005–2009, the odds of dissatisfaction significantly decreased, showing an improvement from the previous wave, hit by a severe economic crisis in 2001 [55]. In addition, surveys developed in Central Eastern European countries and Sweden reported that life satisfaction is associated with income among the old adults [12, 27]. These studies' findings bolster the conclusion that income is associated with life satisfaction in countries with socioeconomic characteristics similar to Brazil [5, 13, 56]. This association may be explained by the greater ability/resources of high-income people to fulfill essential and psychological needs, increasing satisfaction with one's standard of living through the access to goods and services [57].

In this study, participation in religious services was associated with life satisfaction, indicating that old people who participate in religious activity more than twice a month report higher life satisfaction than those who do not participate or participate less often. These findings are corroborated by others studies among general adults and old populations in particular [28, 29, 58–61]. Religious activities may influence in life satisfaction for numerous reasons. First, religious communities provide social integration and support for their members and encourage them to have faith in situations of vulnerability [62]; second, religiously active individuals tend to have greater resiliency following divorce, unemployment, illness, and bereavement, recovering more quickly and more fully; and third, religious communities promote norms regarding personal lifestyles, such as interpersonal and familial relationships, and health behaviors, which could enhance an individual's life satisfaction [63].

Physical activity was another individual-level characteristic that was associated with greater life satisfaction. Life satisfaction was more prevalent in old people who reported to practice physical activity. Cross-sectional and prospective studies examining the association between physical activity and life satisfaction in older adults have found that more active people tend to experience greater life satisfaction compared to their less active peers [64–67]. Additionally, a recent meta-analysis on this theme showed that old people exhibit a stronger association between physical activity and life satisfaction [14]. Physical activity may lead to higher life satisfaction not only due to the physiological benefits it confers, especially to functionality and physical health, but also due to the fact that it enables greater social interaction.

Finally, life satisfaction was more prevalent among participants that had a good/very good self-rated health. Other studies, in both developed and developing countries, have shown similar results among old people [15, 27, 68, 69]. Health plays an important role in life satisfaction and self-rated health provides more information about life satisfaction, as compared to medically-based health measures [15, 69]. A perceived physical vulnerability can amplify the effects of dissatisfaction in old people [70] and, moreover, the perceptions of aging itself influence and are influenced by psychological, physical, functional, clinical, and environmental dimensions [71].

One strength of our study was the use of objective measures of the built environment. This is the first study based on Latin America, to our knowledge, that investigated the built environment characteristics associated with older adults' satisfaction, using multilevel analysis. Many researches that investigated health or other related health outcomes and urban arrangements exclusively rely on the perception of participants about the neighborhood that they live. The objective measurement of the environment can minimize the possibility of a "common source" bias [72]. Individuals' perceptions of the environment may be influenced by personal factors. Also, individuals' residences may be based on their health or their predisposition to given behaviors [73].

We would like to highlighted that, although the item we used to assess life satisfaction is an accepted measurement approach for this topic worldwide [74, 75], there is no gold standard measure for this construct, and self-reported measures of life satisfaction can be vulnerable to a variety of response biases [76]. For this reason, comparisons between studies are quite difficult and their interpretation should be circumspect, because life satisfaction has been measured in different ways across studies from different parts of the world. On the other hand, the administration of the SALS is simple, does not require a major investment of time for either, respondents and interviewers, and it is easily understood by participants [74]. These characteristics of the instrument are especially important in the Brazilian context where 42.3% of the population has less than 8 years of schooling [77], and even higher in the population of our study. Therefore, despite the absence of a transcultural adaptation to Portuguese or validated in the country, SALS is considered a robust measurement of the life satisfaction and its use is strongly acceptable in our context.

Furthermore, other methodological issues should be considered when interpreting the results. Data from this study, by design, are from only two health districts, namely Barreiro and Oeste. Therefore, findings may not be representative to the entire population of the city, although they are similar to others health districts in terms of demographics and socioeconomic characteristics. The BH Health Study was not designed specificaly to assess old populations and thus, for the present study, we used a subset of the sample as a whole. Consequently, conducting analyses stratified by age, as found in additional studies in the literature, is unfeasible due to the small size of the sample of participants included in the 80 years old or older group ($n = 100$), as well as the small size of the sample in some census tracts. The cross-sectional design of this study does not allow for the inference of temporality between exposures and outcomes and the results are susceptible to influence by behavioral, cultural and social factors due to the use of self-reported measures at the individual level.

At the contextual level, the measurement of some attributes may be limited as certain items are liable to temporal variation [24]. A more reliable measurement would require more than one observation for the same segment, so conditions could be averaged across different times and days of the week [24]. Additionally, the assessment of the built environment was conducted 3 years after the BH Health Study. On the other hand, the multilevel analysis approach we used, adjusted for the main individual and also for contextual factors, which are known to confound the associations researched, is considered the most appropriate for evaluating contextual characteristics. This modeling strategy allows for the examination of relative variance at different hierarchical levels and encourages the development of a research hypothesis that examines the role of context [78].

Conclusions

Despite limitations, this analysis advances into the literature regarding built environment and life satisfaction and provides the first estimates of such associations for an old population living in an urban area of Brazil. Some individual characteristics, as well as the neighborhood physical disorder were associated with life satisfaction. Future studies should include prospective analyses and should explore multiple environmental characteristics, such as social cohesion, social interaction, and also variables of the social environment. The present findings suggest that life satisfaction should be assessed whenever evaluating urban redevelopment programs designed to improve neighborhood characteristics and to reduce physical disorder, especially among old adults.

Abbreviations

95%CI: 95% confidence interval; AIC: Akaike information criterion; OSUBH: Observatory for Urban Health in Belo Horizonte; PR: Prevalence ratio; SALS: Self-Anchoring Ladder Scale; SD: Standard deviation; SSO: Systematic social observation

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Authors' contributions

CTV: participated of the conceptualization, methodology, formal analysis, writing—original draft preparation, and writing—review and editing the manuscript. ACSA: participated of the conceptualization, methodology, formal analysis, and writing—review and editing the manuscript. FAP: participated of the conceptualization, investigation, writing—review and editing the manuscript, and funding acquisition. CCX: participated of the conceptualization, investigation, writing—review and editing the manuscript, and funding acquisition. AALF: participated of the conceptualization and writing—review and editing the manuscript. WTC: conceptualization, methodology, formal analysis, writing—review and editing the manuscript, funding acquisition, and she is the project administration. All authors read and approved the final manuscript and consent to publication in this review.

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Availability of data and materials

Data will not be shared. Data were from a household survey conducted by the Observatory for Urban Health in Belo Horizonte (OSUBH) at the Federal University of Minas Gerais. Currently, the authors do not have any special access privileges to these data and confirm that interested researchers may apply for access to these data in the manner described. Data supporting the conclusions of this study are included within the article.

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Federal University of Minas Gerais (protocol n. ETIC 253/06) and the Ethics Research Committee of the Department of Municipal Health (073.2008). Each participant signed an informed consent form. Respondents were guaranteed utmost confidentiality, privacy and anonymity.

Consent for publication

Not Applicable.

Competing interests

The authors declare no conflict of interest.

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Publisher's Note

ANEXO 2

Aprovação do Comitê de Ética em Pesquisa da Universidade Federal de Minas Gerais.

Universidade Federal de Minas Gerais
Comitê de Ética em Pesquisa da UFMG - COEP

Parecer nº. ETIC 253/06

Interessado: Profa. Waleska Teixeira Caiaffa
Departamento de Medicina Preventiva e Social
Faculdade de Medicina - UFMG

DECISÃO

O Comitê de Ética em Pesquisa da UFMG – COEP aprovou, *ad referendum*, no dia 16 de outubro de 2006, após atendidas as solicitações de diligência, o projeto de pesquisa intitulado **"Análise dos fatores condicionantes da saúde da população por áreas delimitadas e formulação de propostas de intervenção: Projeto modos de vida, estilos e hábitos saudáveis em BH (Projeto Move-se BH) - Uma avaliação epidemiológica"** bem como o Termo de Consentimento Livre e Esclarecido do referido projeto.

O relatório final ou parcial deverá ser encaminhado ao COEP um ano após o início do projeto.

Profa. Dra. Maria Elena de Lima Perez Garcia
Presidente do COEP/UFMG

Av. Presidente Antônio Carlos, 6627, Unidade Administrativa II – 2° andar sala: 2005 - 31.270-901– BH - MG
(31) 3499-4592 - FAX: (31) 3499-4516 - coep@prpq.ufmg.br

ANEXO 3

Inquérito do CAF *Survey*

N° Encuesta: _____

CAF – BANCO DE DESARROLLO DE AMÉRICA LATINA
Dirección de Investigaciones Socioeconómicas

Buenos días/tardes, soy encuestador de la empresa (EMPRESA) y por encargo de CAF-Banco de Desarrollo de América Latina, estoy realizando una encuesta sobre aspectos demográficos, socioeconómicos y de hábitat. Me gustaría conversar con alguien que viva en la casa entre 20 y 60 años de edad que pueda brindarnos información sobre su hogar. Esta entrevista es voluntaria y confidencial y sus respuestas se utilizarán únicamente a efectos de investigación. Muchas gracias por su colaboración.

I. DATOS DEMOGRÁFICOS

1. Género **(POR OBSERVACIÓN)**: Masculino 1 Femenino 2

2. ¿Cuántos años cumplidos tiene usted? **(ANOTAR EDAD EXACTA)** _____ (**TERMINAR SI ES MENOR DE 20 O MAYOR DE 60**)

3. En una escala del 1 al 10 donde 1 es "Nada satisfecho" y 10 es "Totalmente satisfecho", ¿qué tan satisfecho está usted con la vida que lleva? **(MOSTRAR TARJETA DE SATISFACCIÓN)**

Nada satisfecho									**Totalmente satisfecho**	**NP**
1	2	3	4	5	6	7	8	9	10	99

4. ¿Tiene hijos?

Sí **(CONTINUAR CON P5)**	1	No **(PASAR A P7)**	2	NP **(PASAR A P7)**	99

5. **(SOLO COD 1 EN P4)** ¿Cuántos hijos tiene?

Cantidad de hijos		NP	99

6. **(SOLO COD 1 EN P4)** ¿Tiene hijos en EDAD ESCOLAR (entre 4 y 18 AÑOS)?

Sí	1	No	2	NP	99

LEER (PARA TODOS): Como usted sabe, en algunas viviendas hay un hogar y en otras más de un hogar, entendiéndose como hogar a quienes comparten todos o la mayoría de los gastos de alimentos la mayor parte del tiempo.

7. ¿Podría decirme cuántos hogares viven en esta vivienda (incluyendo el suyo)? **(ANOTAR NÚMERO EXACTO)**

Cantidad de hogares		NP	99

NOTA AL ENCUESTADOR: SOLO PARA VIVIENDAS CON MÁS DE UN HOGAR. Si responde que hay más de un hogar en P7, hacerle tantas preguntas como hogares adicionales al del encuestado haya.

8. ¿Podría decirme si el jefe de su hogar es familiar directo o indirecto del jefe del (los) otro(s) hogar(es) de esta vivienda? **(UNA SOLA RESPUESTA HORIZONTAL)**

	Sí	**No**	**NP**
a. Primer hogar	1	2	99
b. Segundo hogar	1	2	99
c. Tercer hogar	1	2	99
d. Cuarto hogar	1	2	99
e. Quinto hogar	1	2	99
f. Sexto hogar	1	2	99

LEER (PARA TODOS): Para las siguientes preguntas quisiéramos que tome en consideración a las personas que conforman su hogar.

9. ¿Cuántas personas conforman su hogar (incluyéndose a usted mismo), sin contar al personal del servicio si lo hubiera? **(ANOTAR NÚMERO EXACTO) (SI RESPONDE 1 PERSONA PASAR A P12. SI RESPONDE MÁS DE 1 CONTINUAR CON P10).**

Cantidad de personas		NP	99

10. **(SOLO SI RESPONDE MÁS DE 1 EN P9)** ¿Es Ud. el jefe del hogar?

Sí **(PASAR A P12)**	1	No **(CONTINUAR CON P11)**	2	NP **(PASAR A P12)**	99

11. **(SOLO COD 2 EN P10)** Pensando en su relación de parentesco con el jefe de su hogar, usted es su … **(MOSTRAR Y LEER TARJETA P11) (UNA SOLA RESPUESTA)**

Cónyuge/Marido/Esposo(a)/Pareja	1	Cuñado(a) o pareja de su hermano(a)	8
Hijo(a)	2	Yerno/nuera o pareja de su hijo(a)	9
Hijo(a) de su cónyuge/pareja	3	Nieto(a)	10
Padre/madre	4	Abuelo(a)	11
Cónyuge/pareja de su padre/madre	5	Otro pariente	12
Suegro(a) o el padre/madre de su pareja	6	Otra persona	13
Hermano(a)	7	NP	99

BANCO DE DESARROLLO DE AMÉRICA LATINA

II. MIGRACIONES

(PARA TODOS)

12. ¿Dónde nació? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

En este barrio/vecindario	1	En otro país	4
En otro barrio/vecindario de esta ciudad	2	NP	99
En otra ciudad de este país	3		

13. (SOLO COD 3 o 4 EN P12) ¿La localidad donde nació era rural o urbana?

Rural	1	Urbana	2	NP	99

14. (PARA TODOS) ¿Cuántas veces se ha mudado en los últimos 5 años? **(ANOTAR NÚMERO EXACTO) (SI NO SE HA MUDADO ANOTAR "0")**

Cantidad de veces		NP	99

15. (PARA TODOS) ¿Cuánto tiempo hace que vive en este barrio/vecindario? **(SI NUNCA SE MUDÓ, ANOTAR EN AÑOS LA EDAD DE LA PERSONA)**

Años	
Meses	

16. (PARA TODOS) ¿Cuánto tiempo hace que vive en esta vivienda? **(SI NUNCA SE MUDÓ, ANOTAR EN AÑOS LA EDAD DE LA PERSONA)**

Años	
Meses	

17. (SOLO SI RESPONDE 1 O MÁS EN P14, LOS QUE SÍ SE HAN MUDADO EN LOS ÚLTIMOS 5 AÑOS) ¿En dónde vivía antes de vivir aquí? (**LEER OPCIONES**) **(UNA SOLA RESPUESTA)**

En este barrio/vecindario **(PASAR A P20)**	1	En otro país **(CONTINUAR CON P18)**	4
En otro barrio/vecindario de esta ciudad **(PASAR A P19)**	2	NP **(PASAR A P21)**	99
En otra ciudad de este país **(CONTINUAR CON P18)**	3		

18. (SOLO COD 3 O 4 EN P17) Las personas pueden tener distintas razones para elegir una ciudad donde vivir, un barrio dentro de la ciudad y una vivienda dentro del barrio/vecindario. ¿Cuáles fueron los motivos principales para elegir esta **ciudad**? Puede elegir una, dos o tres opciones. **(LEER OPCIONES Y MOSTRAR TARJETA P18) (HASTA TRES RESPUESTAS)**

Disponibilidad de empleo o mejores condiciones laborales	1	Mayor variedad de bienes y servicios	7
Mejores condiciones empresariales o para emprender	2	Por la oferta de eventos o espectáculos culturales o musicales	8
Buena calidad de la educación y/o bajo costo de la educación	3	Otros	94
Reunión con familiares o amigos residentes aquí	4	Ninguna de las anteriores **(NO LEER)**	96
Por la seguridad o baja delincuencia	5	NP	99
Facilidades para adquirir una vivienda	6		

19. (SOLO COD 2 a 4 EN P17) Ahora piense en su barrio/vecindario, ¿cuáles fueron los motivos principales para elegir este **barrio/vecindario**? Puede elegir una, dos o tres opciones. **(LEER OPCIONES Y MOSTRAR TARJETA P19) (HASTA TRES RESPUESTAS)**

Cercanía a establecimientos educativos	1	Seguridad o baja delincuencia	9
Cercanía a un centro de salud	2	Calidad de los vecinos	10
Cercanía a la familia/amigos	3	Precio del alquiler más accesible	11
Cercanía al trabajo o al lugar de las actividades diarias del hogar	4	Posibilidad de acceder a una vivienda más grande	12
Cercanía a medios de transporte	5	Tranquilidad del barrio/vecindario	13
Cercanía a servicios y comodidades (tales como restaurantes, teatros, cines, centros comerciales)	6	Otros	94
Cercanía a parques y plazas	7	Ninguna de las anteriores **(NO LEER)**	96
Buena iluminación nocturna e higiene urbana	8	NP	99

20. (SOLO COD 1 a 4 EN P17) Ahora, piense en su vivienda, ¿cuáles fueron los motivos principales para elegir esta **vivienda**? Puede elegir una, dos o tres opciones. **(LEER OPCIONES Y MOSTRAR TARJETA P20) (HASTA TRES RESPUESTAS)**

Era accesible económicamente u otras razones financieras	1
La apariencia interior de la vivienda, la distribución del espacio o el diseño	2
El tamaño de la vivienda o el número de habitaciones	3
La apariencia o el diseño exterior	4
El patio, los árboles o la vista desde la vivienda	5
La calidad de la construcción	6

Era la única vivienda disponible en ese momento	7
Cercanía a medios de transporte	8
Otros	94
Ninguna de las anteriores **(NO LEER)**	96
NP	99

21. (SI RESPONDE 0 EN P14, O 99 EN P17) Si Ud. tuviera que mudarse, ¿a dónde preferiría hacerlo? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

A otra vivienda de este barrio/vecindario **(PASAR A P24)**	1	A otro país **(CONTINUAR CON P22)**	4
A otro barrio/vecindario de esta ciudad **(PASAR A P23)**	2	No estaría dispuesto a mudarme **(PASAR A P25) (NO LEER)**	5
A otra ciudad de este país **(CONTINUAR CON P22)**	3	NP **(PASAR A P25)**	99

22. (SOLO COD 3 o 4 EN P21) Las personas pueden tener distintas razones para elegir una ciudad donde vivir, un barrio dentro de la ciudad y una vivienda dentro del barrio/vecindario ¿Qué factores tendría Ud. en cuenta al momento de elegir en qué **ciudad** vivir? Puede elegir una, dos o tres opciones**. (LEER OPCIONES Y MOSTRAR TARJETA P18) (HASTA TRES RESPUESTAS)**

Disponibilidad de empleo o mejores condiciones laborales	1	Mayor variedad de bienes y servicios	7
Mejores condiciones empresariales o para emprender	2	Por la oferta de eventos o espectáculos culturales o musicales	8
Buena calidad de la educación y/o bajo costo de la educación	3	Otros	94
Reunión con familiares o amigos residentes aquí	4	Ninguna de las anteriores **(NO LEER)**	96
Por la seguridad o baja delincuencia	5	NP	99
Facilidades para adquirir una vivienda	6		

23. (SOLO COD 2 a 4 EN P21) Ahora piense en el barrio/vecindario, ¿qué factores tendría Ud. en cuenta al momento de elegir un **barrio/vecindario** dentro de una ciudad para vivir? Puede elegir una, dos o tres opciones. **(LEER OPCIONES Y MOSTRAR TARJETA P19) (HASTA TRES RESPUESTAS)**

Cercanía a establecimientos educativos	1	Seguridad o baja delincuencia	9
Cercanía a un centro de salud	2	Calidad de los vecinos	10
Cercanía a la familia/amigos	3	Precio del alquiler más accesible	11
Cercanía al trabajo o al lugar de las actividades diarias del hogar	4	Posibilidad de acceder a una vivienda más grande	12
Cercanía a medios de transporte	5	Tranquilidad del barrio/vecindario	13
Cercanía a servicios y comodidades (tales como restaurantes, teatros, cines, centros comerciales)	6	Otros	94
Cercanía a parques y plazas	7	Ninguna de las anteriores **(NO LEER)**	96
Buena iluminación nocturna e higiene urbana	8	NP	99

24. (SOLO COD 1 a 4 EN P21) Ahora, piense en la vivienda, ¿qué factores tendría Ud. en cuenta al momento de elegir una **vivienda** dentro de un barrio/vecindario? Puede elegir una, dos o tres opciones**. (LEER OPCIONES Y MOSTRAR TARJETA P24) (HASTA TRES RESPUESTAS)**

Si es accesible económicamente u otras razones financieras	1	La calidad de la construcción	6
La apariencia interior de la vivienda, la distribución del espacio o el diseño	2	Cercanía a medios de transporte	7
El tamaño de la vivienda o el número de habitaciones	3	Otros	94
La apariencia o el diseño exterior	4	Ninguna de las anteriores **(NO LEER)**	96
El patio, los árboles o la vista desde la vivienda	5	NP	99

III. VIVIENDA

(PARA TODOS)

25. En una escala del 1 al 10, donde 1 es "Nada satisfecho" y 10 es "Totalmente satisfecho", ¿qué tan satisfecho se siente usted con su vivienda? **(MOSTRAR TARJETA DE SATISFACCIÓN)**

Nada satisfecho									**Totalmente satisfecho**	**NP**
1	2	3	4	5	6	7	8	9	10	99

26. En una escala del 1 al 10, donde 1 es "Nada satisfecho" y 10 es "Totalmente satisfecho", ¿qué tan satisfecho se siente usted con su barrio/vecindario? (**MOSTRAR TARJETA DE SATISFACCIÓN)**

Nada satisfecho									**Totalmente satisfecho**	**NP**
1	2	3	4	5	6	7	8	9	10	99

27. Usted o los miembros de su hogar son: **(LEER OPCIONES Y MOSTRAR TARJETA P27) (UNA SOLA RESPUESTA)**

Propietarios de la vivienda y terreno	1	Inquilinos o arrendatarios de toda la vivienda	5
Propietarios de la vivienda solamente	2	Inquilinos o arrendatarios de parte la vivienda	6
Ocupantes gratuitos con permiso (por ej. cedida por razones de trabajo, o prestada por familiar o amigo)	3	Otro	94
Ocupantes de hecho (sin permiso)	4	NP	99

28. (SOLO COD 1 o 2 EN P27, PROPIETARIOS) ¿De qué manera su hogar accedió a la vivienda? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Accedieron a una vivienda ya construida	1	Accedieron al terreno y luego construyeron por etapas	3
Accedieron al terreno y luego construyeron toda la vivienda	2	NP	99

29. (SOLO COD 1 o 2 EN P27, PROPIETARIOS) ¿Cuál fue la principal fuente de fondos que utilizó su hogar para acceder a esta **vivienda**? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

30. (SOLO COD 1 EN P27, PROPIETARIOS VIVIENDA Y TERRENO) ¿Cuál fue la principal fuente de fondos que utilizó su hogar para acceder a este **terreno**? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

	P29: Vivienda	P30: Terreno
Ahorros	1	1
Crédito bancario (hipoteca o préstamo personal)	2	2
Préstamo de otras organizaciones financieras (no bancarias)	3	3
Crédito con asistencia del estado	4	4
Préstamo de familiares o amigos	5	5
Programa estatal de acceso a la vivienda o vivienda social	6	6
Regalo o donación	7	7
Herencia	8	8
Otro	94	94
NP	99	99

31.1 (PARA TODOS) ¿Cuánto le preocupa la posibilidad de que lo desalojen de su vivienda?

No le preocupa	1	Le preocupa	2	Le preocupa mucho	3	NP	99

31. (PARA TODOS) Con respecto a la tenencia del suelo, dígame cuál de estas situaciones predomina en la cuadra en donde vive: **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Los vecinos cuentan con título de propiedad.	1	No tienen título de propiedad, ni boleto de compra-venta.	3
Los vecinos cuentan con boleto de compra-venta u otro documento, **pero no tienen título de propiedad**.	2	NP	99

(SOLO PARA LOS QUE NO ALQUILAN, COD 1 A 4 EN P27)

32. En una escala del 1 al 3, donde 1 significa "En desacuerdo", 2 "Ni de acuerdo ni en desacuerdo" y 3 "De acuerdo", ¿cuán de acuerdo se encuentra con cada una de las siguientes afirmaciones? **(LEER FRASES) (UNA SOLA RESPUESTA HORIZONTAL)**

	En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	NP
32.1 Alquilar una vivienda es desperdiciar el dinero, es preferible comprarla.	1	2	3	99
32.2 Comprar es la inversión más segura de acuerdo a su ingreso.	1	2	3	99
32.3 Si la cuota de un crédito de vivienda fuera equivalente a lo que se paga de alquiler, pediría un crédito.	1	2	3	99
32.4 No alquila porque no tiene las garantías u otra documentación necesaria para poder alquilar.	1	2	3	99

33. Si alquilara la totalidad de esta vivienda, ¿cuánto estima que podría cobrar mensualmente a sus inquilinos? (referirse a la totalidad de la vivienda) **(RESPUESTA ESPONTÁNEA) (ANOTAR MONTO EN MONEDA NACIONAL)**

Monto		NP	999999

34. ¿Ud. destina alguna parte de su vivienda para alquiler?

Sí **(CONTINUAR CON P35)**	1	No **(PASAR A P49)**	2	NP **(PASAR A P49)**	99

(SOLO COD 1 EN P34)

35. ¿Usted tiene un contrato firmado por el alquiler de esa parte de la vivienda?

Sí	1	No	2	NP	99

36. ¿Qué vínculo tenía Ud. con el inquilino al momento de alquilarle? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Amigo o conocido	1	No tenía vínculo más allá del alquiler	4
Familiar	2	NP	99
Vínculo profesional	3		

37. ¿Con qué frecuencia recibe el pago del alquiler? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Semestral	1	Semanal	3	NP	99
Mensual	2	Diario	4		

38. ¿Cuánto cobra en concepto de alquiler al mes? **(RESPUESTA ESPONTÁNEA) (ANOTAR MONTO EN MONEDA NACIONAL)**

Monto		NP	999

39. ¿Cuántos metros cuadrados cubiertos tiene en alquiler para uso **exclusivo** del inquilino (excluya espacios comunes)? **(RESPUESTA ESPONTÁNEA) (PUEDE AYUDAR AL ENCUESTADO A HACER EL CÁLCULO SI FUERA NECESARIO, por ejemplo sumando las dimensiones de los diferentes ambientes / cuartos)**

Metros cuadrados		NP	999

39.1 NO PREGUNTAR. (PARA EL ENCUESTADOR): Registrar tipo de respuesta en P38

Respuesta espontánea y sin dificultad	1	Respuesta aproximada y/o asistida	2

40. Imagine que una mala situación económica le impidiera a su inquilino el pago de dos cuotas consecutivas de alquiler, ¿qué cree que haría Ud. al respecto? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Le daría facilidades de pago.	1	Otro	94
Intentaría sacarlo de la vivienda con ayuda de la justicia y/o la policía.	2	NP	99
Intentaría sacarlo de la vivienda por la fuerza.	3		

(SOLO PARA LOS INQUILINOS – LOS QUE ALQUILAN, CÓDIGOS 5 o 6 EN P27)

41. Señale las razones más importantes por las que actualmente usted alquila en lugar de comprar una vivienda. **(LEER OPCIONES Y MOSTRAR TARJETA P41) (HASTA TRES RESPUESTAS)**

No reúno los requisitos para acceder a un crédito de vivienda.	1
No me alcanza el dinero para pagar la cuota de un crédito de vivienda.	2
No encuentro el tipo de vivienda deseada que se adapte a mis ingresos.	3
Prefiero alquilar porque me puedo mudar cuando quiero.	4
No compro una vivienda porque prefiero destinar ese dinero a otras inversiones.	5
El alquiler me permite vivir en lugares donde no podría comprar.	6
El alquiler me permite vivir en una vivienda más grande que la que podría comprar.	7
Este no es un buen momento para comprar una vivienda	8
NP	99

42. ¿Usted tiene un contrato firmado por el alquiler de esta vivienda?

Sí	1	No	2	NP	99

43. ¿Qué vínculo tenía Ud. con el arrendador al momento de alquilar la vivienda? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Amigo o conocido	1	No tenía vínculo más allá del alquiler	4
Familiar	2	NP	99
Vínculo profesional	3		

44. ¿Usted tuvo que dejar, firmar o presentar alguna garantía para alquilar esta vivienda?

Sí **(CONTINUAR CON P45)**	1	No **(PASAR A P46)**	2	NP **(PASAR A P46)**	99

45. (SOLO PARA LOS INQUILINOS QUE DEJARON GARANTÍA, CÓDIGO 1 EN P44) ¿Qué tipo de garantía? **(LEER OPCIONES) (RESPUESTA MÚLTIPLE)**

Garantía propietaria	1	Otro	94
Fianza, seguro de caución u otro tipo de aval (una tercera persona responde en caso de no pago)	2	NP	99
Depósito de dinero	3		

(TODOS LOS INQUILINOS – LOS QUE ALQUILAN, COD 5 o 6 EN P27)

46. ¿Con qué frecuencia se hace el pago del alquiler? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Semestral	1	Semanal	3	NP	99
Mensual	2	Diario	4		

47. ¿Cuánto gasta su hogar en concepto de alquiler al mes? **(RESPUESTA ESPONTÁNEA) (ANOTAR MONTO EN MONEDA NACIONAL)**

Monto		NP	99

48. Imagine que una mala situación económica le impidiera el pago de dos cuotas consecutivas del alquiler de su vivienda, ¿qué cree que haría el dueño de la vivienda al respecto? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Le daría facilidades de pago.	1	Otro	94
Intentaría sacarlo de la vivienda con ayuda de la justicia y/o la policía.	2	NP	99
Intentaría sacarlo de la vivienda por la fuerza.	3		

(PARA TODOS)

49. Indique si se encuentra de acuerdo, ni de acuerdo ni en desacuerdo o en desacuerdo con cada una de las siguientes frases. **(LEER FRASES) (UNA SOLA RESPUESTA HORIZONTAL)**

	En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	NP
49.1 Prefiere vivir en una zona más tranquila aunque eso signifique que tenga mayor tiempo de viaje al trabajo o a los lugares o los que va con frecuencia.	1	2	3	99
49.2 Prefiere vivir en una vivienda más grande aunque eso signifique que tenga mayor tiempo de viaje al trabajo o a los lugares o los que va con frecuencia.	1	2	3	99

50. En relación a su vivienda, ¿cuál es el material predominante de construcción del piso? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Tierra, arena, cartón o tablones en mal estado	1	Otros	94
Cemento o gravilla	2	NP	99
Mosaico, granito, mármol, cerámica, terracota, parquet, alfombra, baldosa y similares	3		

51. ¿Cuál es el material predominante de las paredes exteriores? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Material de desecho o lámina de cartón	1	Ladrillo, piedra, bloque de cemento o concreto con revoques / pulido / friso	5
Lámina de asbesto o metálica / chapas / calaminas / zinc	2	Otros	94
Tablones, Piedra con barro, Quincha / caña con barro / bahareque, Tapia, Adobe, Bambú o Palma	3	NP	99
Ladrillo, piedra, bloque de cemento o concreto sin revoques / pulido / friso	4		

52. ¿Cuántos ambientes/cuartos tiene este hogar para su uso exclusivo? (excluyendo baños) **(ANOTAR NÚMERO EXACTO)**

Ambientes		NP	99

53. De éstos, ¿cuántos se usan habitualmente para dormir? **(ANOTAR NÚMERO EXACTO)**

Ambientes		NP	99

54. ¿Cuántos metros cuadrados cubiertos tiene la vivienda que su hogar habita (o la parte de la vivienda que usa exclusivamente, en caso que el hogar comparta la vivienda)? **(RESPUESTA ESPONTÁNEA) (PUEDE AYUDAR AL ENCUESTADO A HACER EL CÁLCULO SI FUERA NECESARIO, por ejemplo sumando las dimensiones de los diferentes ambientes / cuartos)**

Metros cuadrados		NP	99

54.1 NO PREGUNTAR. (PARA EL ENCUESTADOR): Registrar tipo de respuesta en P54

Respuesta espontánea y sin dificultad	1	Respuesta aproximada y/o asistida	2

55. ¿Utilizan en esta vivienda algún ambiente / cuarto como lugar de trabajo?

Sí, exclusivamente como lugar de trabajo	1	Si, entre otros usos	2	No	3	NP	99

56. (SOLO COD 1 O 2 EN P55) ¿Qué actividades se desarrollan allí? **(LEER OPCIONES) (RESPUESTA MÚLTIPLE)**

Taller (carpintería, costura, mecánica, etc.)	1	Otro	94
Negocio/local	2	NP	99
Consultorio/estudio	3		

(PARA TODOS)

57. ¿Esta vivienda accede al agua principalmente por…? **(MOSTRAR Y LEER TARJETA P57) (UNA SOLA RESPUESTA)**

Conexión formal a la red pública / acueducto (con boleta/ factura)	1	Pozo de agua compartido	6
Pozo de agua en la vivienda	2	Camión cisterna	7
Conexión informal a la red pública (sin boleta/ factura)	3	Otros medios	94
Conexión a la red pública través de un vecino	4	NP	99
No dispone de agua en la vivienda pero accede a canilla / caño comunitaria	5		

58. ¿Cuentan con cuarto de baño? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Si, dentro de la vivienda	1	Si, fuera de la vivienda	2	No	3	NP	99

59. (SOLO COD 1 O 2 EN P58) ¿Qué servicio de desagüe (eliminación de excretas) tiene? **(MOSTRAR Y LEER TARJETA P59) (UNA SOLA RESPUESTA)**

Excusado / baño / inodoro a red pública de desagüe / cloaca	1	Excusado / baño / inodoro a río, acequia o canal	4
Excusado / baño / inodoro a pozo con cámara séptica	2	NP	99
Excusado / baño / inodoro a pozo, hoyo, excavación en la tierra	3		

60. ¿A esta vivienda le llega la energía eléctrica principalmente por…? **(MOSTRAR Y LEER TARJETA P60) (UNA SOLA RESPUESTA)**

Red pública con medidor domiciliario (con factura)	1	No le llega por ningún medio	5
Red pública con medidor comunitario (sin factura)	2	Otros medios	94
Red pública con conexión irregular (sin medidor)	3	NP	99
Red pública a través de un vecino	4		

61. ¿Ha sufrido interrupciones por más de 24 horas del servicio de energía eléctrica y/o en el servicio de agua en los últimos 6 meses?

Sí	1	No	2	NP	99

62. ¿Cuál es el combustible usado principalmente para cocinar o calentar el agua en su vivienda? (**MOSTRAR Y LEER TARJETA P62) (UNA SOLA RESPUESTA)**

Gas directo / natural (por tubería)	1	Leña / carbón	5
Gas propano GLP por bombas/ balón / cilindro / garrafa / bombona	2	Otro tipo	94
Electricidad	3	NP	99
Kerosene, gasolina, alcohol o petróleo	4		

63. ¿Cómo se deshacen normalmente de la basura de la vivienda? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

La recoge un servicio de recolección de basura	1	Otra forma	94
La depositan en un vertedero / botadero / basural, zanja, río o baldío	2	NP	99
La queman	3		

64. ¿Hizo algunas de las siguientes reformas o mejoras en su vivienda en los últimos 12 meses? **(LEER OPCIONES Y MOSTRAR TARJETA P64) (RESPUESTA MÚLTIPLE)**

Ampliación o construcción de dormitorios	1	Cercos, rejas o veredas / aceras	6
Ampliación o construcción de habitaciones no destinadas a dormir	2	Otros	94
Mejoras en el piso/techo/paredes	3	Ninguna reforma **(NO LEER)**	96
Mejoras en la conexión de servicios	4	NP	99
Cimientos	5		

65. ¿Usted o algún miembro de su hogar es propietario de otra vivienda?

Sí	1	No	2	NP	99

66. (SOLO COD 1 EN P65) ¿Qué destino principal le da a esa otra vivienda? (si tiene más de una refiérase a la más costosa) **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

La utiliza ocasionalmente (por ej. los fines de semana)	1	La está intentando vender	4
La tiene prestada a un familiar o amigo	2	No la quiere alquilar ni vender y está desocupada	5
La pone en alquiler	3	NP	99

(PARA TODOS)

67. ¿A una distancia de 3 cuadras o menos de su vivienda se dan algunas de las siguientes situaciones? **(LEER OPCIONES) (UNA SOLA RESPUESTA HORIZONTAL)**

	Sí	**No**	**NP**
67.1 Edificios, casas o lotes abandonados	1	2	99
67.2 Edificios, casas o lotes tomados ilegalmente o invadidos	1	2	99
67.3 Basurales	1	2	99
67.4 Calles mal iluminadas	1	2	99
67.5 Expendio o consumo de drogas	1	2	99

68. ¿A cuánto tiempo caminando se encuentran los siguientes establecimientos de su vivienda (considere el **más cercano**)? **(LEER OPCIONES Y MOSTRAR TARJETA DE TIEMPOS) (UNA SOLA RESPUESTA HORIZONTAL)**

	Menos de 10 minutos	**Entre 10 y 30 minutos**	**Más de 30 minutos**	**No sabe (NO LEER)**	**NP**
68.1 Hospitales o centros de salud	1	2	3	98	99
68.2 Escuelas o colegios primarios o secundarios públicos	1	2	3	98	99
68.3 Jardines o centros de cuidado de niños menores de 5 años	1	2	3	98	99
68.4 Estación de policía	1	2	3	98	99

IV. ESPACIO PÚBLICO Y BIENES CULTURALES

69. ¿Cuánto tiempo le tomaría llegar caminando a los siguientes servicios o establecimientos públicos **más cercanos** a la vivienda? **(LEER OPCIONES) (UNA SOLA RESPUESTA HORIZONTAL)**

70. ¿Ud. o los miembros del hogar usan este establecimiento habitualmente?

	P69					P70	
	Menos de 10 minutos	Entre 10 y 30 minutos	Más de 30 minutos	No sabe (NO LEER)	NP	Sí	No
1. Parques, plazas o zonas verdes	1	2	3	98	99	1	2
2. Bibliotecas o centros culturales públicos	1	2	3	98	99	1	2
3. Centros deportivos o de recreación comunitarios	1	2	3	98	99	1	2

V. SITUACIÓN LABORAL

NOTA AL ENCUESTADOR: LA INFORMACIÓN SOBRE SITUACIÓN LABORAL REFIERE SIEMPRE AL ENTREVISTADO.

71. (PARA TODOS) ¿Cuál es su situación laboral actual? **(LEER Y MOSTRAR TARJETA P71)** (**SI TIENE MÁS DE UN EMPLEO TOMAR EN CUENTA AL QUE LE DEDIQUE MÁS TIEMPO) (UNA SOLA RESPUESTA)**

Trabajador por cuenta propia	1	Dedicado a los quehaceres del hogar y la familia	9
Dueño o socio de un negocio propio (con al menos un empleado)	2	Retirado o Jubilado	10
Empleado en una empresa o institución del sector privado	3	Estudia, no trabaja ni busca empleo	11
Empleado en una institución o empresa del sector público	4	No trabaja (por razones diferentes a tareas del hogar) ni busca empleo	12
Trabajador de una cooperativa	5	Sin trabajar por incapacidad, o enfermedad prolongada	13
Empleado de limpieza doméstica	6	Vive de alquileres, utilidades, intereses y/o dividendos (rentista)	14
Trabajador familiar no remunerado	7	NP	99
Desempleado (sin trabajo y buscando empleo o buscando iniciar un negocio)	8		

72. En los últimos 3 meses, ¿su hogar ha vivido…. **(LEER OPCIONES) (UNA SOLA RESPUESTA HORIZONTAL)**

	Sí	No	NP
72.1 … de lo que ganan en el trabajo?	1	2	99
72.2 … de lo que tenían ahorrado?	1	2	99
72.3 … de alguna jubilación o pensión?	1	2	99
72.4 … de indemnización por despido?	1	2	99
72.5 … de seguro de desempleo?	1	2	99
72.6 … de subsidios, planes sociales o ayuda social en dinero del gobierno, iglesias, etc.? **(Nota a la encuestadora: incluir ejemplos de planes sociales del estado relevantes para su país) Perú: Pensión 65, Juntos, etc.**	1	2	99
72.7 … con mercaderías, ropa y/o alimentos del gobierno, iglesias, escuelas, etc.?	1	2	99
72.8 … con mercaderías, ropa y/o alimentos de familiares, vecinos u otras personas que no viven en este hogar?	1	2	99
72.9 … con dinero de familiares, vecinos u otras personas que no viven en este hogar?	1	2	99

SI ES CÓDIGO 1, 2, 3, 4, 5, 6 O 7 EN P71 CONTINUAR CON LA P73 (SECCIÓN OCUPADOS – V a)
SI ES CÓDIGO 8 EN P71 IR A LA P85 (SECCIÓN DESEMPLEADOS – V b)
SI ES CÓDIGO 9 AL 14 EN P71 IR A LA P89 (SECCIÓN INACTIVOS – V c)
SI ES CÓDIGO 99 EN P71 IR A LA P91 (MÓDULO EDUCACIÓN)

BANCO DE DESARROLLO DE AMÉRICA LATINA

V. a) SECCIÓN OCUPADOS

LEER: Para las próximas preguntas, le voy a pedir que piense en su ocupación/empleo/actividad laboral principal, es decir, aquel al que le dedica más tiempo.

73. ¿Podría especificar cuál es su **actividad laboral principal** o el tipo de trabajo que desempeña? Por ejemplo, conductor de autobús, peón de la construcción, profesor de universidad…**(ESPONTÁNEA) (PARA CODIFICAR USAR TARJETA OCUPACIÓN)**

NOTA AL ENCUESTADOR: Evite denominaciones profesionales vagas, como gerente, administrativo o granjero. Las descripciones deben reflejar siempre las tareas más importantes de la persona entrevistada. Por ejemplo, un administrativo puede ser de ventas, de personal, o un granjero puede ser agrícola o ganadero, y el gerente puede ser regional o de producción.

74. ¿En qué lugar principalmente desarrolla usted su trabajo? **(LEER Y MOSTRAR TARJETA P74) (UNA SOLA RESPUESTA)**

En un **lugar permanente** fuera de la vivienda (como tienda, local comercial, taller, oficina, etc.)	1	**Sin puesto fijo**, en la calle, en varias casas de familia o viajante (como vendedor ambulante, repartidor de folletos, plomero, etc.)	4
En su vivienda	2	Otro	94
En un puesto fijo en la vía pública, como mercado, plaza o calle	3	NP	99

75. ¿Cuánto tiempo lleva trabajando en su principal empleo actual? **(ANOTAR LA CANTIDAD DE AÑOS Y MESES EXACTOS) (ANOTAR 1 EN "Cantidad de meses" SI EL ENCUESTADO COMENZO A TRABAJAR HACE MENOS DE UN MES) (SI NO RECUERDA EL ANO O EL MES ANOTAR 99)**

Cantidad de años	
Cantidad de meses	

76. Aproximadamente, ¿cuántas personas remuneradas (incluyéndose a usted) trabajan en la empresa, negocio, puesto o establecimiento donde usted desarrolla su empleo principal? **(ESPONTÁNEA) (UNA SOLA RESPUESTA)**

Una persona	1	De 6 a 20 personas	3	Más de 50 personas	5
De 2 a 5 personas	2	De 21 a 50 personas	4	NP	99

	ANOTAR NÚMERO	NP
77. Aproximadamente, ¿cuántos días a la semana suele usted trabajar en su empleo principal?	_____ días	99
78. Aproximadamente, ¿cuántas horas del día acostumbra usted a trabajar en su empleo principal?	_____ horas	99

79. ¿Su empleador o Ud. hace contribuciones / aportes a su jubilación / fondo de pensiones/ seguridad social?

Sí	1	No	2	NP	99

LEER: A continuación voy a preguntarle por su ingreso laboral mensual. Le recuerdo que la información que nos brinde será tratada con absoluta confidencialidad y además será guardada con códigos y no con nombres, por lo que se garantiza el anonimato del respondiente.

80. 1 ¿Cuál es SU ingreso "mensual" normal del trabajo principal que Ud. realiza? **(ANOTAR MONTO EN MONEDA NACIONAL) (ESPONTÁNEA)**

Monto		NP	99

NOTA AL ENCUESTADOR: SI EL ENCUESTADO NO BRINDA INFORMACIÓN ESPONTANEAMENTE (COD 99 EN P80.1) LEER P80.2. Montos expresados en dólares estadounidenses. Convertir a moneda local utilizando tipo de cambio oficial promedio del mes anterior a la aplicación del cuestionario. (ANOTAR MONTO EN MONEDA NACIONAL)

80. 2 ¿Podría decirme en cuál de los siguientes rangos se ubica el ingreso "mensual" del trabajo principal que Ud. realiza? **(MOSTRAR TARJETA P80.2) (UNA SOLA RESPUESTA)**

$100 o menos	1	De $251 a $300	5	De $501 a $600	9	De $1201 a $1500	13
De $101 a $150	2	De $301 a $350	6	De $601 a $800	10	De $1501 a $2000	14
De $151 a $200	3	De $351 a $400	7	De $801 a $1000	11	Más de $2000	15
De $201 a $250	4	De $401 a $500	8	De $1001 a $1200	12	NP	99

(PARA TODOS LOS OCUPADOS)

81. ¿Para encontrar su empleo actual …? **(LEER OPCIONES Y MOSTRAR TARJETA P81) (RESPUESTA MÚLTIPLE)**

Acudió directamente a lugar de trabajo (fábrica, tienda, taller)	1	Acudió a un sindicato o gremio	6
Hizo trámites en una agencia o bolsa de trabajo privada	2	Pidió a conocidos, familiares o vecinos que lo recomendaran o le avisaran de algún trabajo	7
Hizo trámites en una agencia pública de colocación	3	Otros	94
Hizo trámites en algún programa de empleo temporal del gobierno (federal, estatal o municipal)	4	NP	99
Puso o contestó un anuncio en algún lugar público o en medios de comunicación (periódico, radio)	5		

82. Además de su ocupación principal, ¿realizó la semana pasada alguna otra actividad pagada por 1 hora o más?

Sí	1	No	2	NP	99

83. En las últimas 4 semanas, ¿ha buscado cambiar su principal empleo?

Sí	1	No	2	NP	99

84. ¿Usted quisiera trabajar más horas?

Sí	1	No	2	NP	99

(**LUEGO DE RESPONDER EL MÓDULO PASE A P88 Y LUEGO A P91)**

V. b) SECCIÓN DESEMPLEADO

85. En las últimas 4 semanas, ¿ha tratado de encontrar algún empleo o ha hecho alguna gestión para crear su propia empresa o negocio? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Sí, buscar un empleo **(CONTINUAR CON P86)**	1	Sí, crear su propia empresa **(CONTINUAR CON P86)**	2	No **(PASAR A SECCIÓN INACTIVOS, P89)**	3	NP	99

86. (SOLO COD 1 O 2 EN P85) ¿Cuánto hace que está buscando empleo o intentando crear su propia empresa o negocio? **(ESPONTÁNEA) (UNA SOLA RESPUESTA)**

Menos de un mes	1	Entre 4 y 12 meses	3	NP	99
Entre 1 y 3 meses	2	Más de 12 meses	4		

87. (SOLO COD 1 EN P85) ¿Para buscar empleo … ? **(LEER OPCIONES Y MOSTRAR TARJETA P87) (RESPUESTA MÚLTIPLE)**

Acudió directamente a lugar de trabajo (fábrica, tienda, taller)	1	Acudió a un sindicato o gremio	6
Hizo trámites en una agencia o bolsa de trabajo privada	2	Pidió a conocidos, familiares o vecinos que lo recomendaran o le avisaran de algún trabajo	7
Hizo trámites en una agencia pública de colocación	3	Otros	94
Hizo trámites en algún programa de empleo temporal del gobierno (federal, estatal o municipal)	4	NP	99
Puso o contestó un anuncio en algún lugar público o en medios de comunicación (periódico, radio)	5		

(PARA TODOS LOS OCUPADOS O DESEMPLEADOS, COD 1 a 8 EN P71)

88. En una escala del 1 al 3, donde 1 significa “En desacuerdo”, 2 “Ni de acuerdo ni en desacuerdo” y 3 “De acuerdo”, ¿cuán de acuerdo se encuentra con cada una de las siguientes afirmaciones? **(LEER FRASES Y MOSTRAR TARJETA P88) (Nota a la encuestadora: la tarjeta debe incluir las frases sobre las que manifiestan su grado de acuerdo o desacuerdo)**

El lugar donde vivo me perjudica para conseguir empleo porque…	**En desacuerdo**	**Ni de acuerdo ni en desacuerdo**	**De acuerdo**	**NP**
88.1…al vivir lejos de los posibles lugares de trabajo demoro mucho tiempo en llegar.	1	2	3	99
88.2…al no tener un buen acceso al transporte público demoro mucho tiempo en llegar.	1	2	3	99
88.3…no tengo acceso a servicios de cuidado infantil cercanos a mi domicilio.	1	2	3	99
88.4…no pude asistir a entrevistas de trabajo debido a la distancia o al costo.	1	2	3	99
88.5…hay prejuicios acerca del barrio/vecindario donde vivo.	1	2	3	99

V. c) SECCIÓN INACTIVOS

89. ¿Alguna vez ha tenido un empleo remunerado de más de tres meses de duración y al menos 4 horas diarias?

Sí	1	No	2	NP	99

90. ¿Cuál es el motivo **principal** por el que no trabaja o busca trabajo? **(LEER Y MOSTRAR TARJETA P90) (UNA SOLA RESPUESTA)**

Enfermedad o incapacidad propia	1	Vivo demasiado lejos de los posibles lugares de trabajo	7
En mi comunidad no es costumbre que personas como yo trabajen	2	Por falta de documentación para trabajar	9
Falta de acceso a servicios de cuidado de niños, adultos enfermos, incapacitados o mayores donde vivo	3	**(NO LEER)** No creo que vaya a conseguir trabajo	10
Otras responsabilidades familiares	4	Otras razones	94
Cuidado de la vivienda por temor de usurpación o desalojo	5	NP	99
Por razones de estudio	6		

VI. EDUCACIÓN

(PARA TODOS)

91. ¿Cuál es el máximo nivel educativo alcanzado por Ud.? Por favor tome en cuenta el nivel educativo correspondiente al último año, semestre o grado aprobado por usted. **(LEER Y MOSTRAR TARJETA P91-92) (UNA SOLA RESPUESTA)**
92. ¿Cuál es el máximo nivel educativo alcanzado por su **Madre**? Por favor tome en cuenta el nivel educativo correspondiente al último año, semestre o grado aprobado por su Madre **(MOSTRAR Y LEER TARJETA P91-92) (UNA SOLA RESPUESTA)**

	P91: Usted	P92: Madre
Sin nivel educativo / sin instrucción	1	1
Preescolar	2	2
Básica / Primaria incompleta	3	3
Básica / Primaria completa	4	4
Secundaria/ Media diversificada y profesional/ Bachillerato incompleta	5	5
Secundaria/ Media diversificada y profesional/ Bachillerato completa	6	6
Educación superior, técnica superior o terciaria **no universitaria** incompleta	7	7
Educación superior, técnica superior o terciaria **no universitaria** completa	8	8
Universitaria incompleta	9	9
Universitaria completa	10	10
Especialización/ Maestría/ Doctorado (al menos 1 año de estudio)	11	11
NP	99	99

93. (COD 1, 2, 3, 4 O 5 EN P91) ¿Cuál fue el motivo **principal** por el que interrumpió sus estudios en su momento? **(LEER FRASES Y MOSTRAR TARJETA P93) (UNA SOLA RESPUESTA)**

Faltaba dinero en el hogar o para mis útiles, pasaje o inscripción etc.	1	Estaba embarazada/ Tuve un hijo	9
Tenía que trabajar por necesidad	2	Me expulsaron de la escuela	10
Prefería trabajar que estudiar	3	No me sentía a salvo en la escuela	11
Me quedaba muy lejos o era muy costoso llegar a la escuela	4	Tenía que cuidar a un familiar (enfermo/incapacitado)	12
No me llevaba bien con los profesores	5	No soportaba la carga académica/Tenía malas calificaciones	13
No me llevaba bien con los otros alumnos	6	No interrumpí mis estudios (repetí de año o empecé tarde)	14
Mis amigos se habían salido de la escuela	7	Otras razones	94
Me sentía discriminado	8	NP	99

(PARA TODOS)
94. ¿Está Ud. en este momento matriculado o cursando estudios? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Sí, estudios para finalizar la educación primaria y/o secundaria	1	Sí, estudios universitarios	3	No	5
Sí, estudios terciarios / técnico superior	2	Sí, curso corto	4	NP	99

95. ¿Cuál es el nivel educativo más alto que espera alcanzar en la educación formal? **(LEER OPCIONES Y MOSTRAR TARJETA P95) (UNA SOLA RESPUESTA)**

Primaria	1	Especialización/ Maestría/ Doctorado	5
Secundaria/ Media diversificada y profesional/ Bachillerato	2	No deseo seguir estudiando	6
Técnica superior/ terciario no universitaria	3	NP	99
Universitaria	4		

VII. ACCESIBILIDAD

96. ¿Cuánto tiempo debe caminar desde su casa para acceder a los siguientes modos de transporte? **(LEER OPCIONES Y MOTRAR TARJETA DE TIEMPOS) (UNA SOLA RESPUESTA HORIZONTAL)**

	Menos de 10 minutos	Entre 10 y 30 minutos	Más de 30 minutos	No aplica (NO LEER)	No sabe (NO LEER)	NP
96.1 Autobús/colectivo/transporte articulado (metrobus, Transmilenio)	1	2	3	97	98	99
96.2 Taxi colectivo/minibús/jeeps/combis (**informal**)	1	2	3	97	98	99
96.3 Metro / Subte	1	2	3	97	98	99
96.4 Tren	1	2	3	97	98	99
96.5 Taxi	1	2	3	97	98	99
96.6 Mototaxi/Bicitaxi	1	2	3	97	98	99
96.7 Bicicletas públicas	1	2	3	97	98	99

97. En referencia al trayecto que debe realizar a pie para acceder al medio de transporte público que más frecuentemente utiliza, puede afirmarse que… **(LEER OPCIONES Y MOSTRAR TARJETA P97) (RESPUESTA MÚLTIPLE)**

Hay zonas inundadas o con barro siempre o cuando llueve	1	Falta pavimento	6
Es inseguro debido a la circulación de vehículos	2	No hay iluminación/ está oscuro	7
Hay robos, atracos, hurtos	3	Ninguna de las anteriores **(NO LEER)**	96
Hay gente tomando bebidas alcohólicas/ consumiendo drogas	4	NP	99
Está sucio / hay basura	5		

98. Tomando en cuenta a todos los miembros de su hogar, ¿cuántos de los siguientes vehículos poseen? Considerar vehículos que funcionan. **(SI NO CUENTA CON ESE TIPO DE VEHÍCULO ESCRIBIR "0", SI NO PRECISA ESCRIBIR "999")**

Vehículo	ANOTAR #	Vehículo	ANOTAR #
98.1 Automóvil(es)/Camionetas(es)/Jeep(s)		**98.3** Camión (es) (para servicio de carga)	
98.2 Motocicleta(s)		**98.4** Bicicleta(s)	

NOTA AL ENCUESTADOR: referir al encuestado a la ubicación de su actividad laboral principal. En caso de que no trabaje o que trabaje en su vivienda, pregunte por el destino más frecuente como ser estudios, llevar los hijos a la escuela, etc. En caso de que el trabajo no tenga una ubicación fija, pregunte por el destino laboral que más frecuentó en la semana anterior.

99. ¿En qué lugar desarrolla su actividad laboral principal? **(COMPLETE LA INFORMACIÓN PARA CADA NIVEL. SI EL ENTREVISTADO NO PUEDE OFRECER INFORMACIÓN EN ALGUNA DE LAS OPCIONES, MARQUE 99)**

		NP
Ciudad		99
Zona		99
Barrio		99
Intersección		99

100. ¿Qué modo o combinación de modos de transporte utiliza más frecuentemente **para llegar** desde su vivienda a su actividad principal en un día habitual? **(LEER OPCIONES Y MOSTRAR TARJETA P100) (RESPUESTA MÚLTIPLE)**

Automóvil particular	1	Moto	9
Transporte de la empresa, establecimiento educativo	2	Metro/Subte	10
Taxi colectivo / minibús / jeeps / combis (informal o piratas)	3	Tren	11
Taxi / radio taxi / remís	4	Autobuses/colectivos (formal)	12
Uber	5	Transporte articulado (Transmilenio, metrobus)	13
Mototaxi/Bicitaxi	6	Otro	94
Caminata	7	NP	99
Bicicleta propia	8		

101. (SOLO USUARIOS EXCLUSIVOS DE TRANSPORTE PRIVADO: SOLO COD 1 A 9 EN P100) ¿Cuál es la **principal** razón por la que no utiliza alguno de los modos de transporte público para llegar a su actividad principal? Porque los modos de transporte público que tengo disponibles: **(LEER OPCIONES Y MOSTRAR TARJETA P101) (UNA SOLA RESPUESTA)**

Son más costosos	1	Contaminan más el medio ambiente	6
Es difícil / toma mucho tiempo llegar a la estación o parada	2	Son menos confortables (poca comodidad)	7
Demandan mayor tiempo de viaje	3	Otro	94
Son más inseguros (robos, hurtos)	4	NP	99
Son más peligrosos (accidentes viales)	5		

102. Aproximadamente, ¿cuánto tiempo demora usted en promedio en llegar desde la puerta de su vivienda a la puerta del lugar donde desarrolla su actividad principal? **(ANOTAR EN MINUTOS) (CONSIDERAR SOLO IDA)**

Minutos		NP	999

103. ¿Cuánto tiempo tardaría en realizar el viaje especificado en **la pregunta anterior sin** congestión de tránsito? **(ANOTAR MINUTOS) (CONSIDERAR SOLO IDA)**

Minutos		NP	999

104. 1 ¿Cuántos días a la semana realiza este viaje normalmente?

Días		NP	999

104. 2 ¿Cuánto gasta aproximadamente por día o semana o mes en trasladarse desde su casa a esa actividad **ida y vuelta**? **(ANOTAR MONTO EN MONEDA NACIONAL)**

Gasto		NP	99999

104. 3 NOTA AL ENCUESTADOR: ESPECIFIQUE SI EL ENTREVISTADO SE REFIRIÓ A GASTO DIARIO, SEMANAL O MENSUAL (UNA SOLA RESPUESTA).

Diario	1	Semanal	2	Mensual	3

105. ¿Cuánto más estaría dispuesto a pagar en transporte si su tiempo de viaje se redujera a la mitad? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

No pagaría más	Un poco más	Bastante más	El doble de lo que paga actualmente	NP
1	2	3	4	99

106. ¿Qué tan de acuerdo estaría usted con el cobro de una tarifa a los automóviles particulares por transitar en horas pico/punta si esto ayudara a reducir el tránsito?

En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	NP
1	2	3	99

107. ¿Qué tan de acuerdo estaría con que las autoridades restringieran parcialmente el tránsito vehicular de automóviles particulares en el centro durante horas pico si esto ayudara a reducir el tránsito?

En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	NP
1	2	3	99

108. ¿Con cuáles de las siguientes personas estaría Ud. dispuesto a compartir el vehículo (sea suyo o de otra persona) en su viaje habitual si esto ayudara a reducir el tránsito? **(LEER OPCIONES Y MOSTRAR TARJETA P108) (RESPUESTA MÚLTIPLE)**

Compañeros de trabajo	1	Desconocidos	5
Vecinos	2	Ninguna de las anteriores **(NO LEER)**	96
Contactos de facebook	3	NP	99
Desconocidos contactados a través de una aplicación móvil	4		

109. ¿Cuáles de las siguientes aplicaciones móviles utiliza para moverse en la ciudad? **(LEER OPCIONES Y MOSTRAR TARJETA P109) (RESPUESTA MÚLTIPLE)**

Google maps	1	EasyTaxi	5
Google transit	2	Aplicaciones de transporte público (ej. comoviajo / comollego / Transmilenio)	6
Waze	3	Ninguna de las anteriores **(NO LEER)**	96
Uber	4	NP	99

LEER: Nos gustaría saber su opinión sobre el sistema de transporte público de su ciudad.

110. En una escala del 1 al 10 donde 1 es "Nada satisfecho" y 10 es "Totalmente satisfecho", ¿qué tan satisfecho está usted con el sistema de transporte público de su ciudad? **(MOSTRAR TARJETA DE SATISFACCIÓN)**

Nada satisfecho									Totalmente satisfecho	NP
1	2	3	4	5	6	7	8	9	10	99

111. ¿Cuál cree Ud. que es el **principal** aspecto a mejorar del sistema de transporte público de su ciudad? **(LEER Y MOSTRAR TARJETA P111) (UNA SOLA RESPUESTA)**

Reducir el tiempo de viaje en el vehículo (autobús/colectivo/tren).	1	Aumentar la cobertura geográfica.	7
Mejorar el confort en el vehículo (autobús/colectivo/tren).	2	Aumentar la cobertura horaria.	8
Mejorar la confiabilidad del horario de llegada del servicio.	3	Mejorar la frecuencia del servicio.	9
Mejorar la seguridad en el vehículo (autobús/colectivo/tren).	4	Reducir la tarifa.	10
Mejorar la seguridad durante la espera en la parada o estación.	5	Otro aspecto	94
Mejorar la seguridad vial.	6	NP	99

112. En el último año (12 meses anteriores), ¿Ud. o algún miembro de su hogar ha sufrido un accidente de tránsito que haya causado a alguno de los involucrados una lesión permanente? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

No, nadie ha tenido un accidente de tránsito	1
Sí, alguien tuvo un accidente, pero nadie sufrió lesiones permanentes	2
Sí, alguien tuvo un accidente y uno de los involucrados sufrió lesiones permanentes	3
Sí, alguien tuvo un accidente y se produjo un fallecimiento como consecuencia	4
NP	99

113. ¿Ha experimentado algún tipo de agresión sexual u acoso físico en el transporte público?

Sí	1	No	2	NP	99

VIII. SEGURIDAD

114. En una escala del 1 al 10, donde 1 es "Nada satisfecho" y 10 es "Totalmente satisfecho", ¿qué tan satisfecho se siente usted con la seguridad (frente a delitos) en su vida cotidiana? **(MOSTRAR TARJETA DE SATISFACCIÓN)**

Nada satisfecho									Totalmente satisfecho	NP
1	2	3	4	5	6	7	8	9	10	99

115. En una escala de 1 a 5, donde 1 significa "Nunca" y 5 significa "siempre", ¿con qué frecuencia diría que se dan en su cuadra las situaciones que voy a citarle? **(LEER OPCIONES Y MOSTRAR TARJETA P115) (UNA SOLA RESPUESTA HORIZONTAL)**

	Nunca	Rara vez	Algunas veces	Casi siempre	Siempre	NP
115.1 Actos de agresiones y/o delitos	1	2	3	4	5	99
115.2 Indigencia / Mendicidad	1	2	3	4	5	99
115.3 Presencia de bandas/pandillas/patotas	1	2	3	4	5	99
115.4 Prostitución	1	2	3	4	5	99
115.5 Vecinos conflictivos	1	2	3	4	5	99

116. ¿Cuál de los siguientes factores se ve principalmente afectado por la inseguridad de su entorno? **(LEER OPCIONES Y MOSTRAR TARJETA P116) (RESPUESTA MÚLTIPLE)**

Mi estado de ánimo en general	1	Mi capacidad de completar los proyectos y metas que me propongo	6
Mis decisiones laborales	2	Las condiciones de seguridad no me afectan	7
Mi planificación familiar (Tamaño de la familia)	3	Me siento seguro en mi entorno **(NO LEER)**	8
Mis decisiones acerca de la educación de mis hijos	4	Ninguna de las anteriores **(NO LEER)**	96
Mi capacidad de completar los proyectos y metas que me propongo	5	NP	99

117. De la siguiente lista, seleccione qué medidas ha tomado en los últimos 12 meses para evitar ser víctima de un delito. **(LEER OPCIONES Y MOSTRAR TARJETA P117) (RESPUESTA MÚLTIPLE)**

Cambiar rutas de circulación en las noches	1	Evitar hablar con desconocidos	8
Evitar dejar su casa o apartamento solo	2	Evitar el uso de joyas y llevar demasiado dinero u otro objeto de valor	9
Evitar hablar con la policía o con cualquier autoridad	3	Evitar caminar sólo en las noches	10
Evitar llegar a su hogar muy tarde	4	Otros	94
Hablar más con la policía o con cualquier autoridad	5	Ninguna de las anteriores **(NO LEER)**	96
Hablar o participar en reuniones de vecinos sobre seguridad	6	NP	99
Evitar ir a parques y plazas	7		

118. ¿Su vivienda cuenta con alguna de las siguientes alternativas como medio de protección contra la delincuencia? **(MOSTRAR TARJETA P118) (RESPUESTA MÚLTIPLE)**

Alarma contra robo	1	Otros	94
Cámaras de vigilancia	2	Ninguna de las anteriores **(NO LEER)**	96
Rejas, cerco eléctrico o cerraduras de seguridad	3	NP	99
Vigilancia privada	4		

119. (SOLO COD 1 a 4, o COD 94 EN P118) ¿Alguna de las alternativas mencionadas en la pregunta anterior fue adquirida en el último año (12 meses anteriores)?

Sí	1	No	2	NP	99

(PARA TODOS)

120. ¿Con cuánta frecuencia diría usted que pasa la policía (excluya vigilancia privada) frente a su casa? (a pie o en auto) **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Todos los días	1	Menos de tres veces por semana	3	Nunca	5
Tres veces por semana o más	2	Raramente/ casi nunca	4	NP	99

121. ¿Ud. o algún miembro de su hogar fue víctima de alguno de los siguientes delitos en los últimos 12 meses?
122. (SOLO COD 1 EN P121) ¿Estos eventos ocurrieron dentro de su barrio/vecindario o fuera del barrio/vecindario? **(SI FUE MÁS DE UNO DEL TIPO, REFERIRSE AL ÚLTIMO)**

DELITO		P121			P122		
		Sí	No	NP	En el barrio/vecindario	Fuera del barrio/vecindario	NP
A	Hurto o robo (con o sin lesiones)	1	2	99	1	2	99
B	Otro delito (secuestro, estafa/extorsión, agresión física, agresión sexual, etc.)	1	2	99	1	2	99

IX. PARTICIPACIÓN CIUDADANA Y CAPITAL SOCIAL

(PARA TODOS)

123. ¿Votó en la última elección presidencial? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

Sí voté	1	No voté	2	No tenía edad suficiente para votar	3	NP	99

124. ¿Ud. o algún miembro de su hogar participan frecuentemente de alguna organización, asociación de vecinos, comité vecinal, consejo comunal, ONG, etc. para alguno de los siguientes fines? **(LEER FRASES Y MOSTRAR TARJETA P124) (RESPUESTA MÚLTIPLE)**

Mejorar la seguridad del barrio / vecindario	1	Mejorar la provisión de servicios de electricidad, agua, gas, etc.	5
Mejorar la iluminación del barrio / vecindario	2	No participo de ninguna organización **(NO LEER)**	96
Mejorar el estado de las calles / carreteras y veredas / aceras del barrio / vecindario	3	NP	99
Mejorar la apariencia general del barrio / vecindario	4		

125. Indique si se encuentra "en desacuerdo", "ni de acuerdo ni en desacuerdo" o "de acuerdo" con cada una de las siguientes afirmaciones. **(LEER FRASES UNA A UNA) (UNA SOLA RESPUESTA HORIZONTAL)**

	En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	NP
125.1 Lamentaría mucho mudarse de esta ciudad.	1	2	3	99
125.2 Lamentaría mucho mudarse de este barrio/vecindario.	1	2	3	99
125.3 Lamentaría mucho que sus vecinos se mudaran a otro barrio/vecindario.	1	2	3	99

126. ¿Cuáles considera que son los principales motivos de discriminación en esta sociedad? Indique las tres más importantes. **(LEER OPCIONES Y MOSTRAR TARJETA P126) (HASTA TRES RESPUESTAS)**

El nivel socioeconómico	1	Diferencias entre habitantes antiguos y nuevos	9
El nivel educativo	2	La afiliación a partidos políticos	10
La tenencia de tierra	3	Las creencias religiosas	11
El lugar de origen	4	La etnia (raza, cultura)	12
El lugar de residencia	5	Las preferencias sexuales	13
El lugar de trabajo	6	El aspecto físico	14
El género	7	Otros	94
Diferencias entre jóvenes y generaciones mayores	8	NP	99

127. En el supuesto de que Ud. tenga una emergencia como pérdida de trabajo, enfermedad u otras, a quienes de las siguientes personas puede recurrir para: **(LEER OPCIONES) (RESPUESTA MÚLTIPLE EN CADA CASO)**

	Familia	Amigos	Vecinos	Ninguno	NP
127.1 Pedir dinero prestado	1	2	3	96	99
127.2 Dejar al cuidado de niños	1	2	3	96	99
127.3 Pedir refugio temporal	1	2	3	96	99

128. ¿Usted piensa que la calidad de vida actual de su hogar, respecto a la que tenía CINCO AÑOS atrás, es peor, igual o mejor?

Peor	Igual	Mejor	NP
1	2	3	99

129. ¿Usted piensa que la calidad de vida de su hogar en el futuro, respecto a la actualidad, será peor, igual o mejor?

Peor	Igual	Mejor	NP
1	2	3	99

X. SALUD

(PARA TODOS)

130. En general, ¿usted diría que su salud es...? **(LEER OPCIONES)**

Mala	Regular	Buena	NP
1	2	3	99

131. ¿Cuánto tiempo ha pasado desde su último examen físico general o chequeo de rutina por un médico u otro profesional de la salud? No incluya visitas por problemas específicos. **(LEER Y MOSTRAR TARJETA P131) (UNA SOLA RESPUESTA)**

Nunca	0	Más de 2 años, pero no más de 3 años	3	NP	99
Hace un año o menos	1	Más de 3 años, pero no más de 5 años	4		
Más de un año, pero no más de 2 años	2	Hace más de 5 años	5		

132. En una semana habitual, ¿cuántos días realiza actividades físicas, durante al menos 10 minutos, incluyendo tiempo que pasa caminando o haciendo esfuerzo físico en su trabajo? **(ANOTAR NÚMERO EXACTO DE DÍAS)**

Días por semana		No realiza estas actividades	96	NP	99

133. ¿Hay en su hogar niños de hasta 5 años de edad?

Si **(CONTINUAR CON P134)**	1	No **(PASAR A P135)**	2	NP **(PASAR A P135)**	99

134. (SOLO COD 1 EN P133) En las últimas dos semanas ¿alguno de ellos ha sufrido de alguna de las siguientes enfermedades? **(LEER OPCIONES) (RESPUESTA MÚLTIPLE)**

Enfermedades respiratorias (Respiración rápida, asfixia, hundimiento de costillas, ruido al respirar)	1	Ninguna de las anteriores **(NO LEER)**	96
Diarrea	2	NP	99
Fiebre	3		

135. (PARA TODOS) A continuación le presentamos varias frases que se refieren a cómo se sintió **durante la última semana**. Por favor indique con qué frecuencia experimentó cada una de las siguientes emociones. **(LEER FRASES Y MOSTRAR TARJETA P135) (UNA SOLA RESPUESTA HORIZONTAL)**

	Menos de 1 día	1-2 días	3-4 días	5-7 días	NP
135.1 Me molestaron cosas que usualmente no me molestan	1	2	3	4	99
135.2 Me costaba mantenerme concentrado en lo que estaba haciendo	1	2	3	4	99
135.3 Me sentí deprimido	1	2	3	4	99
135.4 Sentí que todo lo que hacía me demandaba mucho esfuerzo	1	2	3	4	99
135.5 Me sentí optimista sobre el futuro	1	2	3	4	99
135.6 Me sentí con miedo	1	2	3	4	99
135.7 Dormía sin poder descansar	1	2	3	4	99
135.8 Estaba contento	1	2	3	4	99
135.9 Me sentí solo	1	2	3	4	99
135.10 No podía "seguir adelante"	1	2	3	4	99

XI. DATOS DE CLASIFICACIÓN

136. ¿Ud. tiene documento de identidad?

Sí	1	No	2	NP	99

137. ¿Cuál es su situación de pareja actual? **(LEER OPCIONES) (UNA SOLA RESPUESTA)**

En pareja y conviviendo	1	Sin pareja	3
En pareja sin convivir	2	NP	99

138. ¿Cuáles de los siguientes bienes tiene el hogar? **(LEER OPCIONES) (RESPUESTA MÚLTIPLE)**

Heladera/nevera o freezer aparte	1	Lavarropas / lavadora	6
Televisor	2	Lavaplatos	7
Teléfono fijo o celular	3	Aire acondicionado	8
Computadora de escritorio o portátil	4	Ninguna de las anteriores **(NO LEER)**	96
Microondas	5	NP	99

POR OBSERVACION

Ob1. Definir características de la calle

Calle asfaltada	1	Pasillo	3
Cale de tierra	2	Otro	94

Ob2. ¿Hay alumbrado público en la cuadra?

Si	1	No	2

Ob3. ¿Hay veredas en la cuadra?

Si	1	No	2

Ob4. Definir tipo de vivienda **(UNA SOLA RESPUESTA)**

Casa independiente	1	Vivienda colectiva (callejón / solar / corralón / multi/ pensión)	3
Apartamento en edificio	2	Vivienda precaria o improvisada, Cabaña, Choza, Rancho, Casilla	4

Ob5. ¿Cuántos pisos tiene la vivienda? **(ANOTAR NUMERO EXACTO)**

Cantidad de pisos	