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## Prospects for Introducing Medium-Density Row Housing in Jeddah City

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### Abstract

Architectural researchers ensure that residential buildings in any area are appropriately planned for the landscape and meet the needs of current and future residents. Row houses are well known in residential sectors of the United States and many European countries, but the data on row housing in Saudi Arabia is very limited. As residential structures, row houses are reasonably priced and architecturally resilient. They also fill the affordable housing gap for middle-class residents – sometimes called the “missing middle” – in major urban centers such as Jeddah. Like other cities of its size, Jeddah has been slow to adopt medium-density residential structures. This research evaluates the Jeddah community’s likelihood of accepting row housing, surveying a cross-section of residents seeking housing options other than the apartments currently available. Our questionnaire investigated variables such as gender, age group awareness, house size, architectural functional features, preferable cost, and other considerations. The data and resulting analysis concluded that more than 90% of the respondents would prefer row houses to current options as their primary housing choice.

**Keywords:** Row Houses, Jeddah Residential Types, Affordable Houses, Medium-Density Housing Types.

### 1. Introduction

With the rapid growth of the population and economy in Saudi Arabia, the lifestyle has been enhanced and exerts pressure on sustainable housing choices. These changes have encouraged internal migration from rural areas to urban centers, as Saudis search for better lives, significantly increasing the housing demand. Developing proper planning and infrastructure to accommodate large populations in cities has become a challenge for the government (Giddings, B. *et al.*, 2020). The second-largest city in Saudi Arabia, Jeddah, has a long history and is situated in a key region. The city’s urban footprint is more prominent than its infrastructure can now support, and Jeddah now faces several structural difficulties due to this growth (Aljoufie, M., & Tiwari, A., 2020). Cheaper homes and medium-density housing are increasingly in demand. In Jeddah city, most houses are attached to each other, sharing a common wall, and are termed “duplex houses.” However, they are often considered troublesome for several reasons, including maintenance, resale issues, less privacy, etc.

All the residential buildings are categorized into three density levels: low, medium, and high. Low-cost dwellings in places with easy access to critical services and activities are referred to as affordable-accessible housing. In compact, multi-use residential areas, such housing includes low-cost apartments, townhouses, small-lot single-family homes, and ancillary suites. Inexpensive and accessible housing is in high demand, worldwide, and increasing its supply can assist cities in achieving various economic, social, and environmental goals. Hence, the housing ministry in Saudi Arabia has endeavored to provide affordable-accessible housing, mainly by constructing apartment buildings.

Row houses are considered an affordable housing choice. They are one of the most widely recognized residential housing types in several countries, especially the United States, and are most popular in northern European countries. In Saudi Arabia, however, they are less common (Mandal & Byrd,, 2017). According to the American Planning Association, row houses are also called townhouses, patio townhouses, marionettes, court dwellings, and group houses. Rowhouses are categorized as medium-density, low-rise buildings, two- to five-stories tall, and sharing both a common wall and a roofline (Bertolet, 2017, Amen, 2021; Aziz Amen, 2022; Amen et al., 2023 ). Living quarters can be found on several floors, with a traditional layout of living space on the first floor and bedrooms above (Schade, 2008; Genevro et al., 2017).

Casper (2013) noted that Row Houses have earned a symbolic place in urban landscapes, since they are easy to build on small lots, economical to buy, and facilitate high levels of property ownership. According to the American Planning Association (1962), construction costs for row housing has been historically less than that of detached units, for several key reasons. First, the design is easily replicated, requiring only a few plans. Second, their construction process consolidates workers and resources at a single location; third, shared-party walls of row houses reduce material costs. Finally, pipe sewer, plumbing, and gas lines may be built all at once, reducing labor costs.

Many organizations and researchers have defined row houses as a singular-family home with a distinctive look, based on the principle of repetition, standing adjacent to one another with shared, common walls. They also have more than one residential unit in a single structure facing the street, and no dwelling units are located above or below one another, nor between a dwelling unit and the roadway (Seattle Department, 2019; Row Houses, A Housing Typology, 2008; Schade,

2008). Many cities around the world – especially in the United States – have manuals, guidelines, and other sources documenting their rowhouses, including Philadelphia, which is one of the cities dependent on row housing as their main type of residence.

Much historical evidence demonstrates that row houses were an ancient architectural solution for urban dwellings. Around 2,500 years ago, Ionians – one of the four major Greek tribes in what is now western Turkey – designed the city of Priene with a grid of blocks, each measuring 120 by 160 feet. A typical residential block consists of eight attached row houses, oriented southward, with porches facing the port (Genevro *et al.*, 2017). In Europe, the industrial revolution of the 18th and 19th centuries brought tremendous populations into urban conurbations, leading to the creation of vast tracts of row housing for humble workers. Also, in South Australia, the construction of row and attached housing was introduced by the early settlers of English background (Government of South Australia, 2017).



**Figure 1.** Examples of Row House residential areas From the United States. (Schmidt , 2016)

The earliest Philadelphia row houses reflected the building traditions of English settlers who, built the structures in response to London's Great Fire of 1666 (Casper, 2013; Aziz Amen, 2017; Aziz Amen & Nia, 2018; Amen & Kuzovic, 2018; Amen & Nia, 2021). The row or terrace originated in England as a single-occupancy residence with vertical separation between tenancies. Tenement houses first arose in Scotland's bigger towns, such as Glasgow and Edinburgh. Although they resembled English row houses on the front, they were divided horizontally across levels in the manner of flats or apartments on the inside (Government of South Australia, 2017). Two rows of 12 similar and connected buildings were also built in Pienza, Italy, following a significant restoration in 1463. This effort influenced the development of the row house, which became popular in Northern European and British cities in the 16th and 17th centuries. In older Northeastern communities such as New York City, row homes thrived. One reason row houses were built was that they were extremely adaptable, and were employed to suit a wide range of tastes and budgets. They may include designs ranging from single-room bandboxes to magnificent townhouses. The row house was simple to construct on narrow lots and was inexpensive to purchase. By the end of the nineteenth century, Philadelphia had earned the moniker "City of Homes" due to the pervasiveness of row houses (Casper, 2013).



**Figure 2.** Row Houses at one of the American Cities. (Schmidt , 2016)

Row house sizes and building types make them ideal for medium-density housing. Row house dimensions are typically 6 M in width, and vary from 27 M to 30 M in depth. Their maximum height is roughly 15 M. The average Manhattan lot is 6 meters wide, but row residences in the boroughs might be significantly wider. More typically, row dwellings are narrow, and one source identifies them as structures less than 7.5 meters broad. Early row houses in New York sit on 7.6-meter-wide lots, with a depth of 9.1 to 12.1 meters; over time, however, the depth was reduced to 4.2 meters in some cases (American Society of Planning Officials, 1962; Palaiologou, 2011; Genevro, Gorlin, & Murphy, 2017). Row house widths are not standardized for each city, but based on existing scholarship, observations, and research, their widths range from 3.2 M to 7.54 M.



**Figure 3.** Tilley Row House, Austin, TX, USA. (Hsu , 2022)



**Figure 4.** Harrison Grosvenor Heights Row Houses Project, Bethesda, MD, USA. (Group, 2022)

## 2. Statement of the Problem

There are few discussions and literature reviews related to Row Houses as a residential solution in Saudi Arabia, a deficiency that may result from their relative rarity as a residential option, the wider availability of other, medium-density housing, and the housing budgets of Saudi citizens. This article studied public opinion in Jeddah regarding row houses as a residential solution.

## 3. Literature Review

According to the Ministry of Municipal Affairs and Housing Handbook, affordability can be facilitated through land use planning techniques such as building form and design. This option offers other affordable housing opportunities to reduce development expenses through their higher densities. Alternative building forms can vary from row houses to triplexes, quadruplexes, stacked townhouses, and low-, mid-, and high-rise apartments (Ministry of Municipal Affairs and Housing, 2011). The Ministry of Municipal Affairs and Housing Handbook also states that affordable houses might consist of single, semi-detached, and row houses or low-, mid-, and high-rise buildings (Ministry of Municipal Affairs and Housing, 2011). The term “row house” is defined by the Oxford Learner’s Dictionary as a house that is in a row of houses that are joined together on each side (Oxford Learners Dictionaries, 2022). The Merriam-Webster Dictionary adds that row houses consist of a series of houses connected by common sidewalls and forming a continuous group (Merriam-Webster Dictionary, 2022).

The row house building type is a zero-lot, line design townhouse, i.e., multi-level unit types, organized side by side. Individual entrances run the length of row house façades. Porches, stoops, and elevated front yards give homes a significant presence on the street (Building Type Standards, Badger Mountain South: A Walkable and Sustainable Community, Richland, WA, 2010). The economic advantages of the row home as a building form are undeniably their greatest merit. The simple and reasonable approach of adding on units allows for the rapid construction of many houses (Row Houses, A Housing Typology, 2008). Row houses offer more space than apartments, and ownership is more frequent than renting. There are more amenities than apartments, including a small backyard. Because the houses are built next to each other, there is more privacy in the yard and in the house. There is also more flexibility in the interior design. For instance, the basement can be converted into a room of one's choosing.

Row houses are a less expensive dwelling option that also benefit builders and the city by maximizing land utilization. As Keshat stated in their 2017 study:

In the row house scenario – everyone wins. More units are available, and thus more people can live closer to their desired locations. Living closer means fewer and shorter trips, less traffic, and less congestion for everyone. The cost per unit is lower. The taxes per unit are lower, ... The builder’s higher profit incentivizes more builders to build lower-cost units like this. We have added to everyone’s bottom line and made the city more resilient in the process. Furthermore, we only had to sacrifice a small quantity of mostly useless side yards.

Housing affordability is one of the most common problems worldwide. In some countries, like the United States, zoning laws have changed, including the banning of single-family buildings. Such a ban was applied in Minneapolis, Minnesota. As Baca et al (2019) have argued, building more housing on single-family parcels does *not* demand building a skyscraper (Baca, McAnaney, & Schuetz, 2019). There are multiple definitions for housing affordability; one of them “broadly refers

to the cost of housing services and shelter – both for renters and owner-occupiers – relative to a given individual’s or household’s disposable income” (Bieri, 2014). Bieri has also defined housing affordability as “simply refer[ring] to the rent-to-income ratio or house-price-to-income ratio” (Bieri, 2014). Furthermore, as Al-Dosary (2015) said, “a base definition of affordability can be stated as the ability of a household to purchase a home based on median monthly income” (Al-Dosary, 2015).

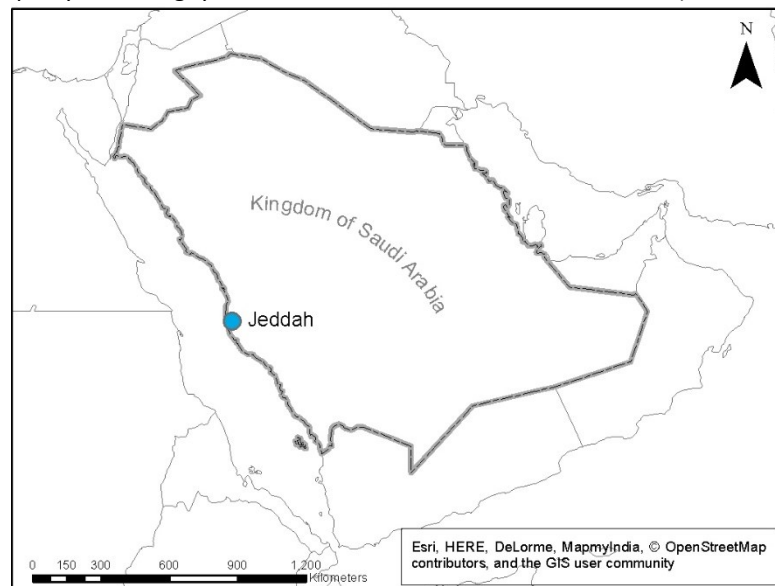
Philadelphia’s stock of row house properties is an amazing asset that allows the city to boast of possessing more low-income homeowners than practically any city in the United States. Other research points to affordable housing’s ability to eliminate homelessness (The Housing Challeng, 2020). Montreal, Canada has various affordable housing options (Shoag 2019); because of rules that encourage mid-rise buildings, housing in the city is reasonably affordable. In comparison to 35% of houses in Canada nationwide, 78% of Montreal’s 779,805 residents live in apartments in buildings with fewer than five floors, in row houses, or in semidetached houses. The city’s nearly 10,000 new ‘Grow Homes,’ which are narrow, prefabricated, lower-priced row dwellings marketed in an incomplete state, are a specific example of cheap medium-density development. The cost of a new Grow Home is under \$150,000, compared to \$360,000 for a single-family home (Litman, 2020). The 2020 Victoria Transport Policy Institute report defined affordable houses as those meeting three conditions. First, housing and transportation are deemed affordable when the combined costs are less than 45% of household budgets. Second, households must be able to gain access to vital services. Third, communities must be responsible to their homeowners, with the capability of reacting to shifting requests (Litman, 2020).

In Al-Dosary’s (2015) study, the most popular types of houses in Saudi Arabia are detached houses, attached houses (i.e., duplexes, apartments), and detached houses in a compound. Further, Al-Dosary (2015) explained that affordable housing costs should be equal to or less than 30% of household income. Row houses ease access to suitable housing options and affordability in Saudi Arabia, and would support the goals of Vision 2020 and 2030 to increase the Saudi household rate to 60% by 2025. Row houses help fill the supply and demand gap in major Saudi cities such as Jeddah. One of the aims of the housing program in Saudi Arabia is to increase the number of affordable housing units in a record time (Housing Program of 2030, 2019).

## 4. Materials and Methods

### 4.1. Study Area

Jeddah is located at 29.21°N and 39.7°E, in the middle of the western shore of the Hejaz Region on the Arabian Peninsula overlooking the Red Sea – the west coast of the Kingdom of Saudi Arabia. Jeddah had a population of over 3.4 million in 2014, which is anticipated to increase to almost 5 million by 2029. It is one of the largest cities in Makkah Province and the second-largest Saudi metropolis (Serageldin et al., 2012). Jeddah is one of the major cities in the Middle East, and in the next 15 years the city is expected to rank fifth among all Arab cities in terms of size. The city is a vital gateway to Makkah and Medina, the two holiest sites in Islam. It is also considered the economic and tourism capital of the Kingdom of Saudi Arabia. Moreover, the city is transforming, as many massive infrastructure projects are planned to improve local residents' quality of life (Municipality, 2022; Nguyen, et al., 2019; CPI PROFILE - Jeddah, 2019).



**Figure 5.** Map of the Study area; Jeddah city.**4.2. Method**

Several sets of data and sources were compiled and analyzed for this study, including both structured and unstructured interviews. The qualitative and quantitative information was gathered mainly from the residents of Jeddah city, with interviews from residents of several other Saudi cities also targeted, to obtain information about residential trends nationwide. An online questionnaire was distributed to residents of the major Saudi cities, with 120 total respondents, exceeding the expected response rate. A descriptive analytical approach was employed to address the research problem and to determine the significance of the results. Information was also gathered via an in-depth review of existing scholarly books, journals, authentic architectural websites, and secondary document websites.

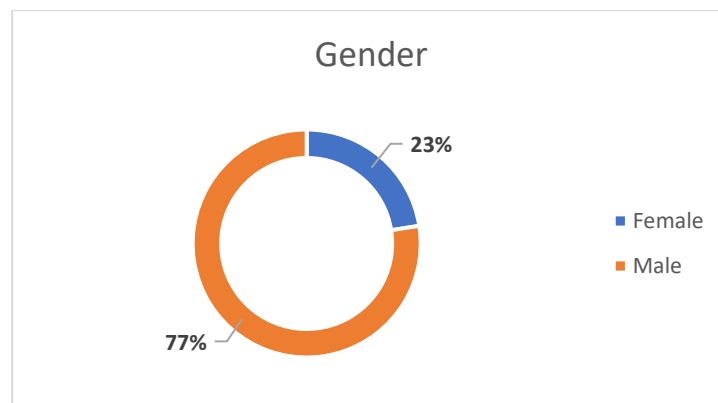
Moreover, we surveyed the existing availability of row houses in Jeddah neighborhoods to recognize the prevalence of this medium-density type of residential house in the current real estate market. Data were analyzed using appropriate methods, as well as appropriate visualization techniques, including the graphs, maps, and tables presented in Section 6, below. Finally, Section 7 explains the obtained information scientifically, with a set of recommendations that might help future researchers to understand the several roles played by row houses in Jeddah city (Aljoufie, M., & Tiwari, A., 2020).

**4.3. Data collection**

The survey was directed toward those wishing to purchase a residential house, especially in Jeddah city, who are over 21 years old and who have had the experience of living in two or more houses (either renting or owning). The questionnaire was distributed randomly to the community of Jeddah city, with 111 total responses.

**5. Result and Discussion**

The survey results were extracted and analyzed via Excel and SPSS software. All questions centered on determining whether respondents were aware of row houses as a residential type and if they were willing to live in these houses. Figure 6 represents the percentage of respondents out of 100 based on their gender. 23% of the responses were from females, while the remaining were from males.

**Figure 6.1.** The percentages of male and female respondents

The people targeted in the research were divided into age groups ranging from 20 to 60 years. Seven categories were made, with each category representing age differences of five years. The percentage respondents of each group are represented in the pie chart (Figure 6.2) below:

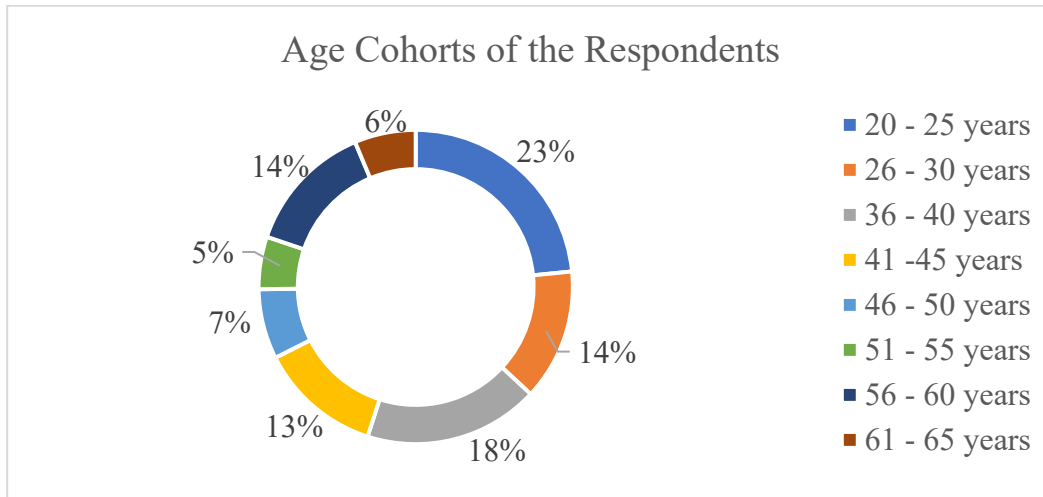


Figure 6.2. The percentages of different age cohorts among the respondents.

The following graph (Figure 6.3) represents the response to the question of whether respondents had lived in a row house before or not. Most respondents had not lived in row housing prior to the survey, regardless of gender. Most of the respondents had neither the choice nor the chance to be introduced to the residential type to purchase.

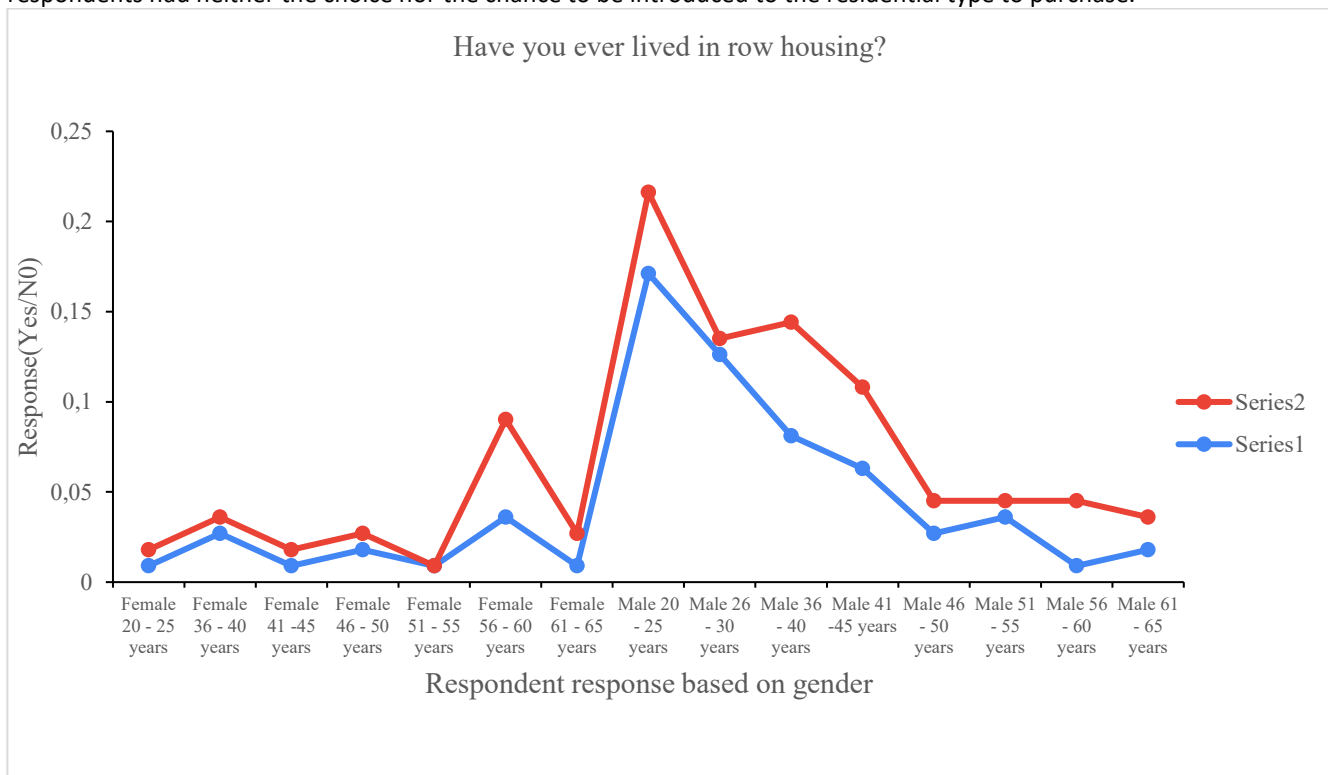


Figure 6.3. The percentage of the respondents' experience living in row houses (yes/no) according to gender and age cohorts.

Figure 6.4 below represents the percentage of respondents' perception of living in a house with all the features of row housing, including widths ranging from 3.3 meters to 7.45 meters (according to gender and age cohort). Most male and female respondents are willing to live in such residential housing, even if the width starts from 3 meters. Both males and females (exceeding 75%) accepted the width ranges of a typical row house. Females of all age groups were most likely to accept any range of width sizes, while males were more likely to accept widths ranging between 3.3 and 7.45 meters.

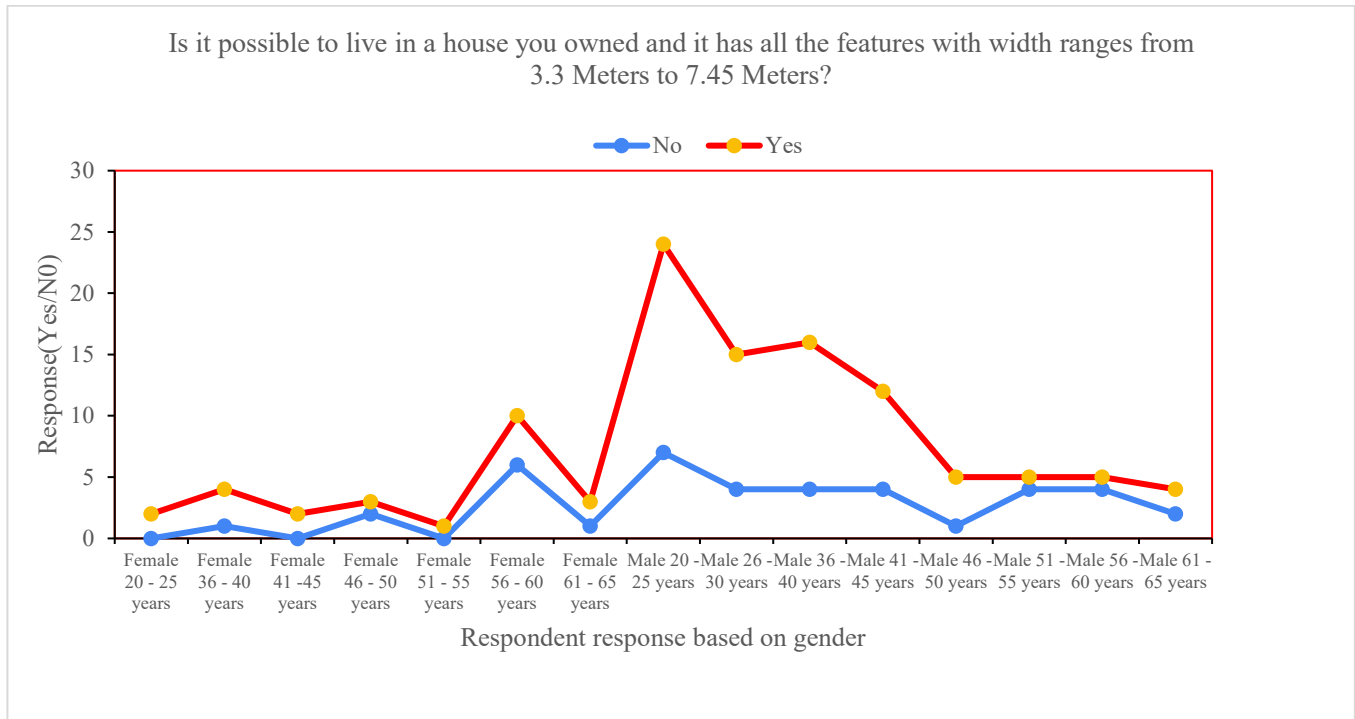


Figure 6.4. Percentage of respondents living in a house with a specific range.

Figure 6.5 below represents the percentage of respondents who perceived row housing as suitable in different Saudi cities, according to their gender and age cohorts. The data appear to support residents' desire for independence and privacy, both of which are available in row housing. The male age groups aged 20 – 25, 26 – 30, and 41 – 45 were the most likely to want to purchase/own their own row houses.

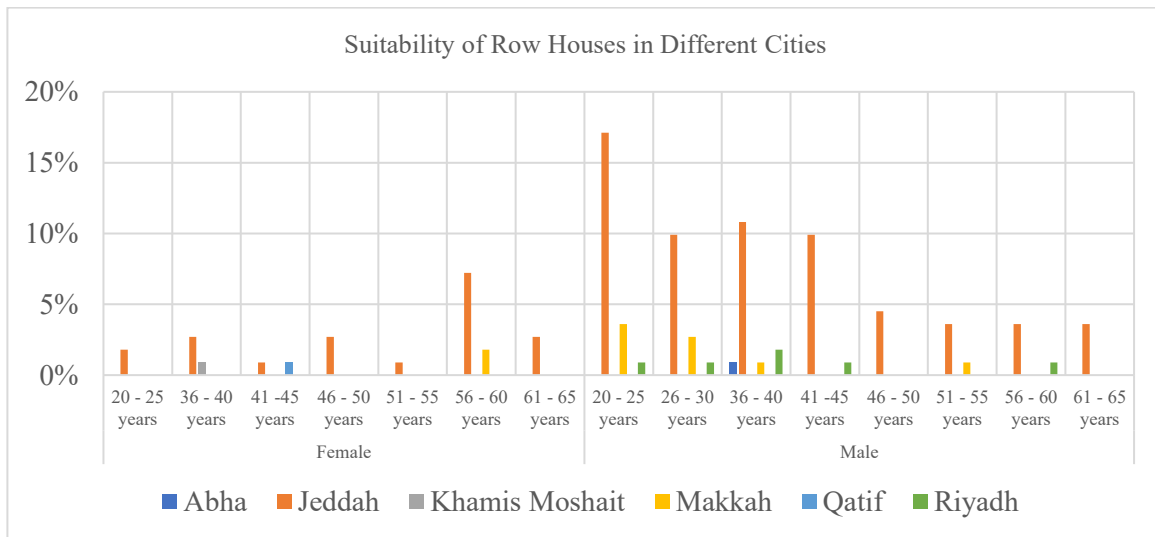


Figure 6.5. Respondents' suitability of row houses in different Saudi cities.

Figure 6.6 below represents the percentage of different respondent groups (according to their gender and age cohorts) based on their capacity to purchase row houses. The male age groups 20 – 25, 26 – 30, and 41 – 45 were willing to pay 100,000 – 500,000 Saudi Riyal to own their own house, with features not available/existent in an apartment building.



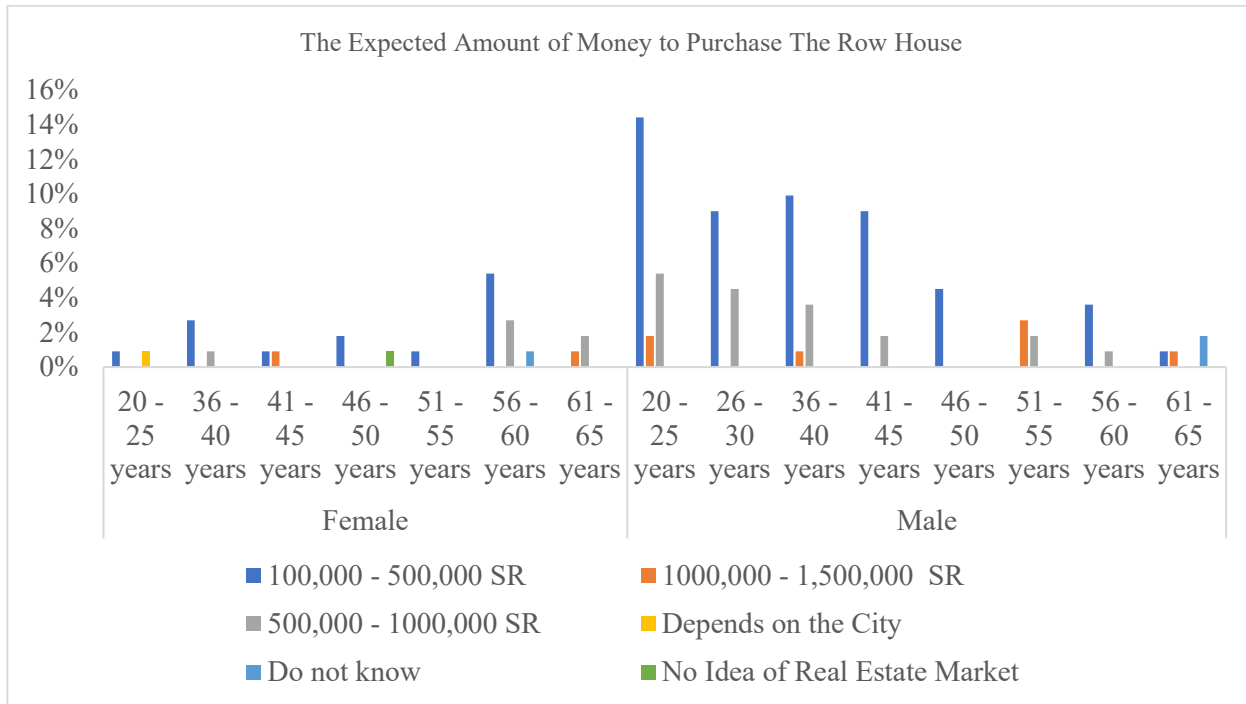


Figure 6.6. Expected amount of money to purchase a row house.

Figure 6.7 below shows the percentages of respondents who would choose living in an apartment versus living in a row house, according to gender and age cohorts. The first tier from the center represents the male vs. female ratio; the second tier represents the age and gender ratios; the third tier represents each age cohort and whether they would prefer an apartment or a row house.

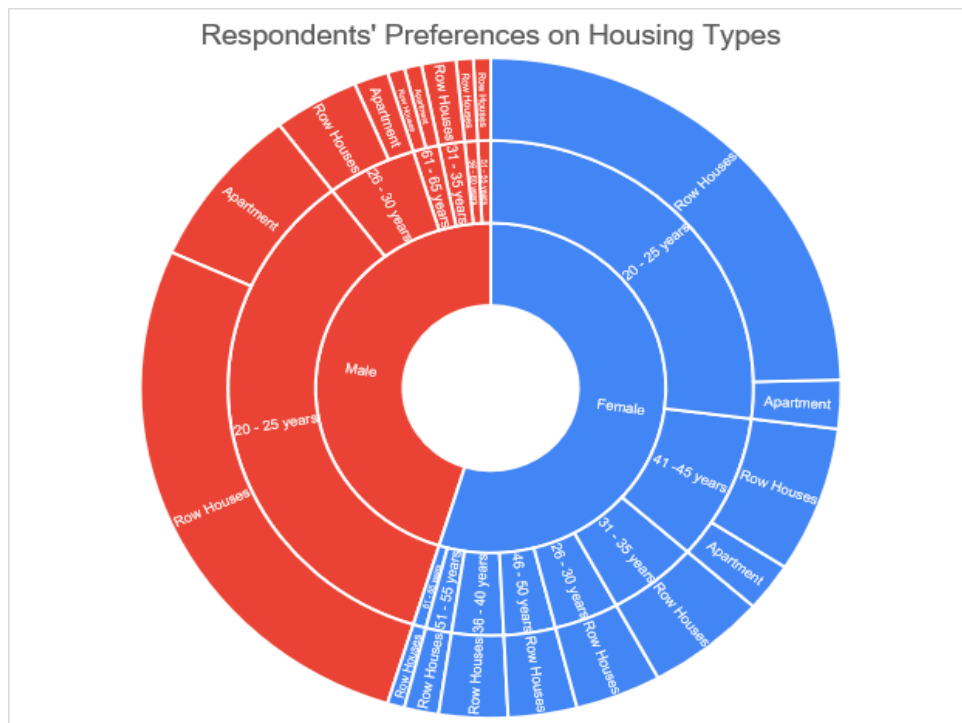


Figure 6.7. Respondents' choices between Apartments and Row Houses.

6. Conclusion

This study evaluated the acceptability of row housing for the Jeddah city community, in the worldwide context of row housing's popularity as an affordable solution to residential city planning. Row housing is not as common or popular in developing economies such as Saudi Arabia as in the United States and many European countries. However, this study demonstrates the acceptability of medium-density row houses among the Jeddah city community. Respondents here preferred the architectural features related to the Row houses compared to those of apartments, and over 80% of them were willing to live in row houses ranging from 3.3 M to 7.45 M wide. The review and analysis of existing literature here has shown that row houses have a long history of adoption among people from varying social levels. Row housing provides multiple architectural choices and solutions for urban centers in need of affordable, medium-density housing solutions. Moreover, row houses are often the first step towards initiating a balance of densities in urban neighborhoods. They can be built to overcome the limitations of depending on either high- or low-density housing types, including vast stretches of vacant properties and limited home ownership among city dwellers. More than 90% of the respondents in the present study indicated a desire for at least the option of row houses for their future homes, and it seems clear that such housing can be one of the choices for the Jeddah City community.

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No funding sources were available to conduct this study.

#### **Conflicts of interests/ Competing interests**

The author declares that the research does not offer any conflict of interest.

#### **Availability of data and material**

All data is available upon request from the author. Note that most of the data I have utilized are summarized in the result section. The nature of the data is qualitative, and thus always available for scientific and research purposes.

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