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The Future of Travel: A Study on Urban Air Mobility Acceptance*

Seyahatin Geleceği: Kentsel Hava Hareketliliğinin Kabulüne Yönelik Bir Çalışma

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ABSTRACT

This research aims to examine the future potential of urban air mobility and determine its acceptance level. The questionnaire technique, which is a qualitative data collection technique, was used in the research. The data obtained from 408 participants were analyzed using SPSS statistical analysis software. Factor analysis was used to determine the structure of the scale. Then, the independent sample T-test and One-Way ANOVA analysis were used to investigate the differences between demographic variables regarding the acceptance of urban air mobility. The research results showed that acceptance of urban air mobility varies according to some demographic factors. It was determined that factors such as gender, marital status, and education level did not significantly affect the acceptance of urban air mobility. However, it was observed that as the income level increased, the respondents evaluated urban air mobility more positively, and their intention to use it increased. Participants with higher incomes had a more positive view of the advantages of urban air mobility and the intention to pay. The results show that income level is an important factor differentiating attitudes towards urban air mobility. Age was found to have an effect on traveling habits.

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ÖZ

Bu araştırma, kentsel hava taşımacılığının gelecekteki potansiyelini incelemeyi ve kabul edilme düzeyini belirlemeyi amaçlamaktadır. Araştırmada nitel veri toplama tekniği olan anket tekniği kullanılmıştır. 408 katılımcıdan elde edilen veriler, SPSS istatistiksel analiz yazılımı kullanılarak incelenmiştir. Ölçeğin geçerliliği ve güvenilirliği, kentsel hava taşımacılığı ile ilgili kavramları doğru bir şekilde ölçüp ölçmediğini ve ölçeğin iç tutarlılığını değerlendirmek için test edilmiştir. Faktör analizi, ölçeğin yapısını belirlemek için kullanılmıştır. Ardından Bağımsız Örneklem T Testi ve Tek Yönlü ANOVA Analizi ile demografik değişkenler arasında kentsel hava taşımacılığının kabulüne yönelik farklılıklar araştırılmıştır. Araştırma sonuçları, kentsel hava taşımacılığı kabulünün bazı demografik faktörlere göre değiştiğini göstermiştir. Cinsiyet, medeni durum ve eğitim düzeyi gibi faktörlerin kentsel hava taşımacılığı kabulü üzerinde istatistiksel olarak anlamlı bir etkisi olmadığı tespit edilmiştir. Ancak, gelir düzeyi arttıkça katılımcıların kentsel hava taşımacılığını daha olumlu değerlendirdiği ve kullanma niyetinin arttığı görülmüştür. Daha yüksek gelire sahip katılımcılar, kentsel hava taşımacılığının avantajlarına ve ödeme niyetine daha olumlu bakmışlardır. Sonuçlar, gelir düzeyinin kentsel hava taşımacılığına yönelik tutumları farklılaştıran önemli bir faktör olduğunu göstermektedir. Yaş faktörünün ise kentsel hava taşımacılığında seyahat alışkanlıkları üzerinde etkili olduğu gözlemlenmiştir.

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GENİŞLETİLMİŞ ÖZET

Giriş ve Araştırmanın Amacı

Kentsel alanlarda nüfusun sürekli artması ve şehirlerin hızla genişlemesi, geleneksel kara ulaşım sistemlerini büyük bir zorlukla karşı karşıya bırakmaktadır. Bu artan nüfus ve şehirleşme, trafik sıkışıklığı, çevresel kirlilik, enerji tüketimi ve zaman kaybı gibi ciddi sorunlara yol açmaktadır. Bu zorlukların üstesinden gelmek ve şehir içi ulaşımı daha sürdürülebilir ve verimli hale getirmek için alternatif ulaşım çözümleri arayışı giderek artmaktadır. Bu bağlamda, kentsel hava taşımacılığı, son yıllarda teknolojik gelişmelerin de etkisiyle büyük bir ilgi ve potansiyele sahip bir çözüm olarak öne çıkmıştır. Kentsel hava taşımacılığı, turizm sektöründe turistik bölgelere hızlı ve etkili ulaşım sağlayarak turistlerin seyahat deneyimini geliştirirken, lojistik sektöründe hızlı kargo ve paket teslimatı ile trafik sıkışıklığını azaltarak lojistik operasyonlarına önemli katkılar sunar. Seyahat sürelerinin azalması, çevresel faydalar, düşük enerji maliyetleri ve altyapı gereksinimlerinin azalması, U.A.M.'yi şehir içi ulaşım ekosistemini yeniden şekillendirmek için cazip bir aday haline getirmektedir. Kentsel hava taşımacılığının avantajları arasında trafik sıkışıklığını azaltma, seyahat sürelerini kısaltma, çevresel etkileri azaltma, enerji verimliliğini artırma ve altyapı ihtiyacını azaltma gibi önemli faktörler bulunmaktadır. Ayrıca, acil durumlarda hızlı ve etkili bir ulaşım seçeneği sunabilme kapasitesi, kentsel hava taşımacılığını daha da cazip hale getirmektedir. Bu çalışmanın amacı, kentsel hava taşımacılığının gelecekteki potansiyelini incelemek ve kabulünü anlamak için bir çerçeve sunmaktır.

Metodoloji

Bu çalışma için veri toplama yöntemi olarak anket kullanılmıştır. Anket, Gaziantep şehrinde yaşayan katılımcılara dağıtılmıştır. Toplamda 408 katılımcı, anketi doldurmuş ve veriler SPSS istatistiksel analiz yazılımı kullanılarak incelenmiştir. Ölçek, katılımcıların kentsel hava taşımacılığını ne kadar kabul ettiklerini ve kullanmaya ne kadar niyetli olduklarını ölçmek için tasarlanmıştır. Elde edilen verilerin analizine geçilmeden önce, ölçeğin geçerliliği ve güvenilirliği test edilmiştir. Geçerlilik testleri, ölçeğin kentsel hava taşımacılığı ile ilgili kavramları doğru bir şekilde ölçüp ölçmediğini belirlemeyi amaçlamıştır. Güvenilirlik testleri ise ölçeğin iç tutarlılığını ve tekrarlanabilirliğini değerlendirmiştir. Verilerin analizinde, faktör analizi kullanılarak ölçeğin faktör yapısı belirlenmiştir. Daha sonra verilere Bağımsız Örneklem T Testi ve Tek Yönlü ANOVA Analizi yapılarak demografik değişkenler arasında kentsel hava taşımacılığının kabulüne yönelik farklılıklar olup olmadığı test edilmiştir.

Bulgular

Araştırma sonuçları, kentsel hava taşımacılığı kabulünün bazı demografik faktörlere göre değiştiğini göstermektedir. Kentsel hava taşımacılığının kabulü cinsiyet ve medeni durum değişkenlerine göre istatistiksel olarak anlamlı bir farklılık göstermediği belirlenmiştir. Ayrıca, eğitim düzeyi ile kentsel hava taşımacılığı kabulü arasında da bir ilişki belirlenmemiştir. Katılımcıların eğitim seviyeleri, kentsel hava taşımacılığını kullanma niyetleri, avantajlarına yönelik algıları, seyahat alışkanlıkları veya ödeme niyetleri üzerinde istatistiksel olarak anlamlı bir etki yaratmamıştır. Bununla birlikte, gelir düzeyi ile kentsel hava taşımacılığı kabulü arasında önemli farklar tespit edilmiştir. Gelir düzeyi arttıkça katılımcıların kentsel hava taşımacılığını daha olumlu bir şekilde değerlendirdiği ve kullanma niyetinin arttığı görülmüştür. Ayrıca, daha yüksek gelire sahip katılımcılar, kentsel hava taşımacılığının avantajlarına ve ödeme niyetine daha olumlu bakmışlardır. Bu sonuçlar, gelir düzeyinin kentsel hava taşımacılığına yönelik tutumları farklılaştıran önemli bir faktör olduğunu göstermektedir. Son olarak, yaş faktörünün kentsel hava taşımacılığı kabulü üzerinde sınırlı bir etkisi olduğu belirlenmiştir. Katılımcıların yaşları, kentsel hava taşımacılığını kullanma niyetini veya kentsel hava taşımacılığı avantajlarına ve ödeme niyetlerine yönelik algıları üzerinde istatistiksel olarak anlamlı bir etki yaratmamıştır. Ancak, yaşın kentsel hava taşımacılığı seyahat alışkanlıkları üzerinde etkili olduğu gözlemlenmiştir.

Sonuç ve Tartışma

Araştırma sonuçları, kentsel hava taşımacılığı kabulünün bazı demografik faktörlere göre değiştiğini göstermektedir. Kentsel hava taşımacılığının kabulü cinsiyet, medeni durum ve eğitim düzeyi değişkenlerine göre istatistiksel olarak anlamlı bir farklılık göstermediği belirlenmemiştir. Öte yandan, kentsel hava taşımacılığının kabulü gelir düzeyine göre istatistiksel olarak anlamlı bir farklılık gösterdiği tespit edilmiştir. Bu sonuca göre gelir düzeyi arttıkça katılımcıların kentsel hava taşımacılığını daha olumlu bir şekilde değerlendirdiği ve kullanma niyetinin arttığı görülmüştür. Ayrıca, daha yüksek gelire sahip katılımcılar, kentsel hava taşımacılığının avantajlarına ve ödeme niyetine daha olumlu bakmışlardır. Son olarak, yaş faktörünün kentsel hava taşımacılığı kabulü üzerinde sınırlı bir etkisi olduğu belirlenmiştir. Katılımcıların yaşları, kentsel hava taşımacılığını kullanma niyetini veya kentsel hava taşımacılığı avantajlarına ve ödeme niyetlerine yönelik algıları üzerinde istatistiksel olarak anlamlı bir etki yaratmamıştır. Ancak, yaşın kentsel hava taşımacılığı seyahat alışkanlıkları üzerinde etkili olduğu gözlemlenmiştir. Chauhan & Carroll'ın (2021) çalışmasına benzer şekilde, bu çalışmanın demografik değişkenlere odaklanmasıyla uyumlu olarak, U.A.M. operasyonlarında insan faktörlerinin dikkate alınması gerektiğinin altını çizmektedir. Buna ek olarak, Straubinger vd. (2021) tarafından tartışılan U.A.M. kabulüne yönelik çok yönlü yaklaşım, bu çalışmanın U.A.M.'in çeşitli demografik gruplar üzerindeki potansiyel etkisini araştırmasıyla örtüşmektedir. Fu vd. (2019) tarafından kullanıcı tercihleri üzerine yapılan çalışma, yaş ve gelirin etkisini vurgulayarak demografik faktörlere odaklanma ile uyumludur.

Introduction

With the rapid advances in technological developments, increasing vehicle density causes both transportation problems and noise and air pollution. One of the solutions to these problems is urban air mobility (Federal Aviation Administration, 2020). Urban Air Mobility (U.A.M.), a new concept, is used for passenger and air cargo mobility within the urban area. It is seen that this system has developed rapidly due to developments in technology and has recently become a trend. U.A.M. has become a trend due to its potential to bring new services for both passengers and logistics/cargo mobility (such as passenger-carrying air taxis or small parcel delivery drones), as well as to provide better resilience in case of emergencies due to various reasons (such as traffic accidents, traffic congestion, catastrophic events, and others).

As a new concept urban air mobility, which refers to a set of vehicles and operational concepts that provide on-demand or scheduled air mobility services for passengers and cargo within a metropolitan area, includes urban and airport services and trips to the immediate surroundings of a city and its surrounding settlements (Vascik, 2020, p. 15). Instead of the U.A.M. system, different names such as VTOL (Vertical Take-off and Landing), Flying-Car/Taxi, and Passenger Drone are used in academic and sectoral literature (Yavaş & Tez, 2021, p. 280).

In this context, the HSR system allows people to travel in a shorter time by preventing delays in their journeys in cities with emergencies and severe traffic congestion. Thus, it improves people's quality of life (Postorino & Sarné, 2020). The recent introduction of Vertical Take-off and Landing (VTOL) vehicles, which require less airspace for take-off or landing, will shorten commuting times, reduce ground mobility congestion, and transform the way people move in, around, and between urban areas by providing specific and directed point-to-point flights between cities (Gillis et al., 2021, p. 411). In the urban air mobility system, people can use these aircraft with vertical landing and take-off capability either by parking them in front of their homes or as taxis that they can take at the busiest point of the city (Federal Aviation Administration, 2020). In this context, it is predicted that the demand for U.A.M. systems will increase over time and may reach a usage similar to the heavy vehicle traffic experienced on today's motorways (Wang et al., 2020a, p. 298).

However, despite all these potentials, as an emerging concept, HSR also faces many obstacles (Thipphavong et al., 2018). These obstacles include safety (Choi & Ji, 2015; Kyriakidis et al., 2015), air traffic management, noise (Vascik, 2017), community acceptance, weather, environmental impacts, and infrastructure (Shaheen et al, 2021, p. 8). These obstacles indicate that accepting RTS will face serious problems (Tuncal & Uslu, 2021).

Noise is a factor in the acceptance of urban air mobility. High levels of noise are one of the frequently mentioned disturbances in the neighborhoods around airports and helipads. Yedavalli and J. Mooberry (2019) found that the second and third highest factors affecting public perception of U.A.M. in four regions, Los Angeles, Mexico City, Switzerland, and New Zealand, were the type of sound produced by eVTOL aircraft and the volume of sound produced by an airplane (Yedavalli & J. Mooberry, 2019). However, as the market for IST matures, noise concerns can be mitigated through technological advances (e.g., aircraft design and electrification) (Shaheen et al, 2021, p. 10).

Air Traffic Management (ATM) is also an important issue in urban air mobility. Air traffic management, which has a traditional structure, will also undergo a serious change. Helicopters and fixed-wing aircraft flying over cities will have to share busy airspace simultaneously with autonomous aircraft (EmbrearX, 2021). Therefore, the control of air traffic (Air Traffic Control (ATC)) is also important to prevent collisions between aircraft and between aircraft and obstacles in the maneuvering area and to ensure regular traffic flow (Yılmaz & Ulvi, 2022). In ensuring air traffic order and safety, safe flights can be ensured with ADS-B, which provides the benefit of automatic tracking that determines the position of aircraft and broadcasts it to other aircraft and ATC systems. In this context, effective integration of the ADS-B system can play an important role in ATC.

The development of new technologies and alternative solutions to heavy traffic problems have increased the interest in ITS. The interest in RHT is also closely linked to the development of electrically powered aircraft. According to the proponents of U.A.M., the shared use of electric aircraft can save emissions. Kassliwal (2019) modeled the environmental impact of eVTOLs using 2020 forecasts of average US electricity generation emissions. The study found that a single-passenger eVTOL (i.e., a pilot and no other passengers) leads to 35% lower GHG emissions than a single-passenger gas-powered vehicle (Kassliwal, 2019).

U.A.M. has the potential to transform urban travel by providing faster connections between housing, work, sports, health, and other facilities. However, to achieve this goal, it must fly close to and over high-density population areas and integrate different modes of transport and the electricity grid with existing city infrastructure (Garrow et al., 2021, p. 17). In this context, the successful deployment of a U.A.M. will require a comprehensive infrastructure for charging/fuelling stations and communications, navigation, surveillance, and IT infrastructure. Initially, air carriers will be able to utilize existing helipads. However, as U.A.M. develops, infrastructure and service providers must identify existing infrastructure and better understand how it can be redesigned, refurbished, adapted, modified, and redeveloped for U.A.M.with minimal physical changes (Shaheen et al, 2021, p. 12).

Despite the obstacles mentioned above, urban air mobility is known to be the fast, affordable, safe, convenient, and easily accessible transport alternative of the future (Baur et al., 2018). In recent years, it has attracted significant attention with the promise of bringing a new mode of transport to urban environments (Preis, 2020).

Urban air mobility has great potential in the future. Research on the potential societal barriers of emerging technology is essential to understanding the potential vitality of the technology from a societal perspective and the opportunities and challenges associated with markets, use cases, business models, and partnerships. The main problem of this research is the need to find effective solutions to the transport problems cities face. In particular, the need for more conventional land transport systems in the face of increasing population and city growth brings problems such as traffic congestion, time loss, and environmental issues. Therefore, studying a new and sustainable transport alternative, such as the acceptance and adoption of urban air transport, is a critical problem in understanding how cities can solve these challenging transport problems. However, as a result of the literature review, it has been determined that there are a limited number of studies on urban air mobility in national literature (Yavas & Tez, 2021; Tuncal & Ulsu, 2021; Dag et al., 2022), although there are essential studies in international literature. Therefore, this study aims to fill the literature gap and contribute to future research.

1. Literature Review

Today, urban air mobility comes to the forefront as an alternative solution to traffic problems on the road. Urban air transport is an essential component of the future transport system. With the developments in this field, it has the potential to provide more effective and sustainable solutions to the transport problems of cities.

This new business model draws attention to its significant reduction in travel time in urban and intercity transport, less damage to the environment in the long term, reduced energy costs, and fewer infrastructure resources compared to highways (Yedavalli & Mooberry, 2019, pp. 3-4). Local authorities are also turning towards urban air mobility due to these remarkable features. On the other hand, Grandl et al. (2018) predicted that RRT service could be started in 2025 and a total of 23,000 RRTs with a scale of approximately 1000 units could be operated in cities with a population of approximately 5-10 million people by 2035. Some studies in the literature on urban air mobility are given below.

As with any new concept, there is a need to identify the primary research areas that will assist in developing successful RMC operations. Chauhan and Carroll (2021) aimed to examine existing research and identify potential human factors issues and areas where future research is needed. The study found that there is a need for empirical research to understand how many aircraft an operator can effectively control simultaneously and under what conditions performance and safety can be optimized. There is a need to examine how the U.A.M. automation interfaces will affect pilot confidence and use of automation, and there is a need to discuss how U.A.M. infrastructure constraints will affect ground worker workload, stress, and performance. It was also noted that it is important to consider public perception and journey quality. Factors such as vehicle inputs (manual or automatic maneuvering capabilities), vehicle characteristics, passenger motivation and willingness, cost, flight routes, schedule, and convenience can affect passenger perception. These factors must be examined to ensure optimum ride quality and acceptance of U.A.M.

It has been observed that most of the existing research on the development of urban air mobility focuses on technological and engineering capabilities, such as vehicle development. Edwards et al. (2019), tried to fill this gap by focusing on short-term urban air mobility operations and investigating the capabilities and impacts of human operators as traffic managers in the U.A.M. system. In an air traffic control simulation, a human was used to investigate the impact of U.A.M. traffic density, airport routes, and communication procedures on subjective workload and efficiency-related task performance. The findings showed that medium and high-intensity procedures were associated with a high workload.

The acceptance of Urban Air Mobility depends largely on the acceptance of users. Vehicles, flight processes of passengers, and conditions of vertiports will affect the evaluation of potential users (Edwards & Price, 2020). Yavaş and Tez (2023), a theoretical urban air mobility acceptance and usage model (UAM-AUM) was created, and the factors affecting users' acceptance of urban air mobility (UAM) systems were investigated. As a result of the research, it was found that the perceived usefulness variable was the strongest determinant of users' behavioral intention and mediated the effects of U.A.M. acceptance by affecting the intention to use the system together with other variables. It was concluded that general reliability is another factor that encourages consumers' positive intentions towards using an ITS system.

Fu et al. (2019) conducted a study examining users' preferences. In the study, it was found that members of Generation X were less interested in U.A.M. In contrast, millennials and Generation Z members had a higher level of interest even if their income levels were low. In the same study, no significant difference was found between the genders in the level of interest in the U.A.M. However, a parallelism was found between education, income level, and interest in U.A.M.

Johnson et al. (2022) aimed to determine the integration factors of urban air mobility systems with technology adoption acceptance and public perceptions. For this purpose, they surveyed 407 participants across the USA. As a result of the study, respondents expected not only the safety standards of conventional aircraft (e.g., seat belts) but also more feedback (e.g., displays on current and planned flight operations) and that passenger aircraft was not an immediate substitute for day trips once they became available, They found that cabin noise was not a significant deterrent to passenger use, early adopters trusted the technology, were willing to pay more for the journey and generally exhibited riskier behaviors. In comparison, late adopters needed more feedback during the flight and a pilot on board.

Kim et al. (2023) also investigated how trust in urban air mobility (UAM) and service quality are related to user acceptance of UAM. For this purpose, the survey data of 450 participants were analyzed using a partial least squares structural equation model. As a result of the analysis, they found that trust positively influences the intention to use the ITS and that the perception of safety contributes the most to the reliability of the ITS. In addition, transport service quality factors (time-saving, usability, flight comfort, and perceived cost) significantly explained perceived usefulness and ease of use. The path coefficients of the structural model indicate that trust has a greater effect on user attitude towards the ITS than perceived usefulness.

Although many positive and exciting factors are related to Urban Air Mobility, consumer concerns should not be ignored. In addition to the safety concerns encountered while adapting to the U.A.M. system, the presence of in-vehicle cameras, especially in autonomous vehicles, and the impact of social media are also important factors of U.A.M. acceptance (Al Haddad et al., 2020).

The main problem of this research is the need to find effective solutions to the transport problems cities face. In particular, the need for more conventional land transport systems in the face of increasing population and city growth brings problems such as traffic congestion, time loss, and environmental issues. Therefore, studying a new and sustainable transport alternative, such as the acceptance and adoption of urban air mobility, is a critical problem in understanding how cities can solve these challenging transport problems. By addressing this fundamental problem, this research aims to assess the future role of urban air mobility.

The literature shows that implementing urban air mobility is inevitable for many reasons, such as mobility, sustainability, environment, and traffic density. However, for a new technology to be implemented, it must be accepted by the people. This research aims to understand local people's acceptance of urban air mobility according to various demographic factors. In this context, the following hypotheses were developed:

Research Question: Do local people have high levels of acceptance towards urban air mobility?

H_1: Acceptance of urban air mobility shows a statistically significant difference according to gender.

H_2: Acceptance of urban air mobility shows a statistically significant difference according to marital status.

H_3: Acceptance of urban air mobility shows a statistically significant difference according to age.

H_4: Acceptance of urban air mobility shows a statistically significant difference according to education level.

H_5: Acceptance of urban air mobility shows a statistically significant difference according to income level.

2. Research Methodology

In this study on the acceptance of urban air mobility, the scale developed by Yavaş and Tez (2021) was used. The population of the study consisted of the participants in Gaziantep. Data collection from Gaziantep for the Urban Air Mobility acceptance study stems from various influencing factors. Being one of Turkey's key cities with a high population density, the city has a diverse cultural environment that offers abundant data for assessing the effects of urban air mobility on a broad spectrum of societal groups. Gaziantep boasts a prosperous economic framework and is home to six industrial areas. This situation makes it a vital resource for examining the potential impact of urban air travel on the local commerce sector. Furthermore, the influx of migrants caused by the Syrian civil conflict has put immense pressure on the city's infrastructure, primarily in terms of traffic congestion. Within the scope of the research, the convenience sampling method (Patton, 2014) was used to determine the participants. In this context, it was tried to reach passengers with at least one airline experience. Within the scope of the research, a questionnaire form was utilized, and 420 questionnaires were applied in October 2019. However, as a result of the survey application, it was determined that 408 questionnaires had the qualifications to be analyzed. Based on the view that a sample size of 384 and above would be sufficient for a population size of 100,000 and above (Altunışık et al., 2010, p. 135), the analysis phase started. Firstly, the validity and reliability of the scales used in the study were analyzed. It was determined that the KMO and Cronbach's Alpha values of the scales were above 0.80. Therefore, since $0.81<\alpha< 1.00$, it can be said that the scale used is highly reliable (Özdamar, 1999). The reason for conducting an exploratory factor analysis is that in Yavaş & Tez's (2021) scale development study, the study group was between the ages of 17 and 59 and worked in a limited number of occupational groups. In the study we conducted, the participants were sampled more generally without any criteria. For this reason, an exploratory factor analysis was necessary. Within the framework of this research, statistical analyses were conducted to assess the variations among demographic groups based on the data collected. Specifically, One-way Analysis of Variance (ANOVA) and Independent Samples T-Test were employed as statistical methods to quantify the disparities. One-way ANOVA and Independent Samples T-Test, this research rigorously evaluated and quantified the disparities among various demographic groups, contributing to a more nuanced and precise analysis of the research data.

2.1. Aim and Importance of Study

This paper aims to provide an important overview of the search for solutions to the transport challenges facing cities today. The main objective of this paper is to analyze the acceptance and adoption of urban air mobility. This analysis will guide in understanding the future role of urban air mobility.

2.2. Importance of the Research

This research provides an important perspective on how urban air mobility is accepted in society. The results offer significant direction when tailoring marketing strategies, creating programs to raise awareness for various societal segments, and determining the measures necessary for broader integration of urban air mobility. This investigation represents an invaluable asset for the planning and development of forthcoming urban transportation, facilitating a resolution that satisfies the populace's expectations and needs.

3. Results

In this section, analyses serve as fundamental research methodologies employed to address research questions and test hypotheses. Statistical analyses play a pivotal role in examining the data more comprehensively and aiding in the interpretation of findings.

Therefore, in this section, we will provide a detailed overview of how these analytical techniques were applied and how the resulting outcomes were interpreted to shed light on the research objectives.

Table 1. Demographic Characteristics of Participants

Gender	**n**	**%**
Female	186	45,6
Male	222	54,4
Total	408	100
Marital Status	**n**	**%**
Married	90	22,1
Single	318	77,9
Total	408	100
Age	**n**	**%**
18-25 years old	259	63,5
26-35 years old	86	21,1
36-45 years	42	10,3
46-55 years	14	3,4
56 years and above	7	1,7
Total	408	100
Education Status	**n**	**%**
Primary education	22	5,4
High School	109	26,7
Faculty/School	254	62,3
Master and Doctorate	23	5,6
Total	408	100,0
Monthly Income	**n**	**%**
Very low income	153	37,5
Low income	65	16
Avarage income	73	18
High income	40	9,8
Very high income	77	18,7
Total	408	100

Five questions were asked to determine the demographic characteristics of the participants, and the findings obtained through the answers given to these questions are in Table 1. According to the relevant table, 45.6% of the participants in the study were female, and 54.4% were male. 22,1% of the participants were married, and 77,9% were single. The age range of the participants was 18-25 years old (63.5%), 26-35 years old (21.1%), 36-45 years old (10.3%), 46-55 years old (3.4%) and 56 years old and above (1.7%). It was determined that 5.4% of the participants were primary school graduates, 26.7% were high school graduates, 62.3% were faculty/college graduates, and 5.6% were master's and doctorate graduates. While 37.5% of the participants have very low income, 16% have low income, 18% have average income, 9.8% have high income, and 18,7% have very high income.

Table 2. Factor Analysis Results

Items	**Factors**			
	Intention to Use U.A.M.	**U.A.M. Travel Habits**	**U.A.M. Payment Intention**	**Intention to Use U.A.M.**
Using Urban Air Transport will increase my ability to travel	0,821			
Using Urban Air Transport will reduce my accident risk compared to conventional (known) vehicles	0,791			
Using Urban Air Transport will increase my productivity	0,773			
Using Urban Air Transport will improve my performance in relation to my work, travel or leisure experience	0,741			
Using Urban Air Transport will increase the efficiency of my work, travel or leisure experience	0,731			

Using Urban Air Transport will facilitate my work, travel or leisure experience	0,725			
I am usually happy travelling by plane		0,796		
I am usually ready to travel by plane		0,776		
I am usually not afraid of travelling by plane		0,725		
I am usually comfortable travelling by plane		0,716		
I usually feel safe travelling by plane		0,689		
I would be willing to use Urban Air Transport if the cost (fare) for its use was at most 2-3 times the taxi fare.			0,912	
I would be willing to use Urban Air Transport if the cost (fare) for its use was at most 3-4 times the taxi fare.			0,867	
I would be willing to use Urban Air Transport if the cost (fare) for using Urban Air Transport was at most 5-6 times the taxi fare.			0,783	
I would be willing to use Urban Air Transport regardless of the fare			0,563	
I would consider using Urban Air Transport as it is more environmentally friendly than other modes of transport				0,787
In terms of environmental sustainability, I can recommend Urban Air Transport to others				0,762
If I were to fly with Urban Air Transport I would feel eager				0,745
I would feel comfortable if I were to fly with Urban Air Transport				0,734
If I were to fly with Urban Air Transport I would be satisfied				0,732
If I were to fly with Urban Air Transport I would feel safe and secure				0,709
I plan to use Urban Air Transport when it becomes operational				0,706
I estimate that I will use Urban Air Transport when it becomes operational				0,623
Assuming that Urban Air Transport is available, I use it regularly				0,602
I would consider using Urban Air Transport in the future				0,591
Eigen Values	2,322	1,505	1,12	13,625
Total explained variance % 74.287 KMO: ,853				

Table 2 shows the results of the factor analysis. According to the table, as a result of the factor analysis, it was determined that the Urban Air Mobility scale has four dimensions and twenty-five propositions. The eigenvalues and total explained variance values of the dimensions revealed in the factor analysis were given, and it was concluded that the factor loads of the propositions took values between 0,563 and 0,912. As a result of these processes, the first dimension created was named "Intention to Use U.A.M.," and it was determined that this dimension had ten propositions. The second dimension was named "Advantages of U.A.M.," and it was determined that this dimension had six propositions. The third dimension was named "U.A.M. Travel Habits," and it was determined that this dimension had five propositions. The fourth dimension was named "U.A.M. Payment Intention," it was determined to have four propositions.

Table 3. T-Test Results According to Gender Variable

Factors	**Gender**	**Mean**	**Standard Deviation**	**t**	**p**
Intention to Use U.A.M.	Female	3,6967	,76186	,211	,830
	Male	3,6781	,97478		
U.A.M. Advantages	Female	3,6450	,89850	-1,401	,162
	Male	3,7752	,95898		
U.A.M. Travel Habits	Female	2,9919	,81973	-,813	,407
	Male	3,0686	1,03928		
U.A.M. Payment Intention	Female	3,6752	,70530	-1,026	,306
	Male	3,7543	,82762		

Table 3 allows the examination of the factors of intention to use U.A.M., U.A.M. advantages, U.A.M. traveling habits, and U.A.M. payment intention by gender variable. Firstly, focusing on the U.A.M. intention to use factor shows no significant difference between the average intention to use scores of men and women ($t = 0.211$, $p = 0.830$). This result indicates that the intention to use U.A.M. does not vary depending on gender. When the U.A.M. advantages factor was analyzed, no significant difference was found in the mean advantage scores between men and women ($t = -1.401$, $p = 0.162$). This result shows that the advantages of U.A.M. do not change depending on gender. In the U.A.M. traveling habits factor, the mean score of women is slightly lower than that of men, but this difference is not statistically significant ($t = -0.813$, $p = 0.407$). In other words, there is no significant difference between the gender groups regarding U.A.M.'s traveling habits.

Lastly, in the factor of intention to pay for the U.A.M., the mean score of women is slightly lower than that of men, but this difference is again not statistically significant (t = -1.026, p = 0.306). Therefore, no significant difference was observed between gender groups regarding the intention to pay U.A.M.

Table 4. T-Test Results According to Marital Status Variable

Factors	Marital Status	Mean	Standard Deviation	t	p
Intention to Use U.A.M.	Married	3,7472	,91522	,725	,469
	Single	3,6702	,87584		
U.A.M. Advantages	Married	3,7742	,97727	,656	,512
	Single	3,7005	,92297		
U.A.M. Travel Habits	Married	3,0646	,91570	,348	,728
	Single	3,0249	,95736		
U.A.M. Payment Intention	Married	3,7808	,81358	,841	,401
	Single	3,7024	,76440		

Table 4 shows that there is no significant difference in mean intention scores between married and single participants (t = 0.725, p = 0.469). This result suggests that intention to use U.A.M. does not vary according to marital status. Secondly, there is no significant difference in the mean advantage scores between married and single participants (t = 0.656, p = 0.512). This result indicates that the perceived advantages of U.A.M. are not influenced by marital status.

In the case of U.A.M. Travel Habits, the table reveals no significant difference in the mean scores between married and single participants (t = 0.348, p = 0.728). Therefore, U.A.M.'s travel habits are similar based on marital status.

Lastly, for the factor of U.A.M. Payment Intention, the table shows no significant difference in the mean payment intention scores between married and single participants (t = 0.841, p = 0.401). Hence, U.A.M.'s payment intention is not influenced by marital status either.

Table 5. Anova Test Results According to Education Level Variable

Factors	Education Level	Mean	Standard Deviation	f	p
Intention to Use U.A.M.	Primary education	3,6174	1,20038	1,212	,305
	High School	3,5907	,88541		
	Bachelor's degree	3,7451	,82275		
	Master and Doctorate	3,4913	1,13209		
U.A.M. Advantages	Primary education	3,7273	1,08942	,389	,761
	High School	3,6662	,90272		
	Bachelor's degree	3,7428	,92168		
	Master and Doctorate	3,5572	1,06312		
U.A.M. Travel Habits	Primary education	3,0114	1,07592	,921	,431
	High School	3,1173	,95117		
	Bachelor's degree	2,9757	,91707		
	Master and Doctorate	3,2283	1,09988		
U.A.M. Payment Intention	Primary education	3,6465	,95136	,353	,787
	High School	3,6623	,77697		
	Bachelor's degree	3,7457	,75049		
	Master and Doctorate	3,7176	,88593		

Table 5 presents the results of an analysis of variance (ANOVA) conducted to assess whether participants' education levels have a significant impact on their responses to four different factors related to U.A.M.: Intention to Use U.A.M., U.A.M. Advantages, U.A.M. Travel Habits, and U.A.M. Payment Intention. The ANOVA results indicate that there is no statistically significant difference in the mean intention scores among participants with different education levels (F = 1.212, p = 0.305). This suggests that participants' education levels do not significantly influence their intention to use U.A.M.

Similarly, for the factor of U.A.M. Advantages, the analysis reveals that there is no significant difference in mean advantage scores across various education levels (F = 0.389, p = 0.761). Therefore, participants' education does not appear to have a substantial impact on their perceptions of the advantages of U.A.M. The ANOVA results show no significant difference in mean scores for

U.A.M. Travel Habits among participants with different education levels (F = 0.921, p = 0.431). This suggests that individuals' education levels do not play a significant role in shaping their travel habits related to U.A.M.

Lastly, concerning U.A.M. Payment Intention, the analysis indicates that there is no statistically significant difference in mean payment intention scores across various education levels (F = 0.353, p = 0.787).

Table 6. Anova Test Results According to Income Variable

Factors	Income	Mean	Standard Deviation	f	p
Intention to Use U.A.M.	Very low income	3,6710	,83149	2,250	,063
	Low income	3,7206	,79231		
	Average income	3,4558	1,02289		
	High income	3,7521	,78906		
	Very high income	3,8811	,94365		
U.A.M. Advantages	Very low income	3,6097	,89677	4,115	**,003**
	Low income	3,7844	,80366		
	Average income	3,4674	1,03974		
	High income	3,9795	,89065		
	Very high income	3,9684	,95253		
U.A.M. Travel Habits	Very low income	2,9344	,85334	2,805	**,026**
	Low income	2,9518	,95163		
	Average income	2,9132	,90084		
	High income	3,2671	1,00241		
	Very high income	3,2873	1,08537		
U.A.M. Payment Intention	Very low income	3,6204	,72802	3,394	**,010**
	Low income	3,7168	,70004		
	Average income	3,5696	,92240		
	High income	3,8687	,64004		
	Very high income	3,9518	,79979		

Table 6 presents the results of the analysis of variance (ANOVA) to measure whether the income levels of the respondents statistically differentiate the factors of U.A.M. (Intention to Use U.A.M., U.A.M. Advantages, U.A.M. Travel Habits, and U.A.M. Payment Intention) according to the demographic data of the respondents.

The ANOVA results show no statistically significant difference between respondents with different income levels in the Intention to Use U.A.M. factor (F = 2.250, p = 0.063). For the factor of U.A.M. advantages, the analysis reveals a significant difference in the mean advantage scores between respondents with different income levels (F = 4.115, p = 0.003). A post hoc test was conducted to determine the differences between income groups. As a result of the Tukey test, it was found that participants with higher income levels had higher levels of acceptance of the advantages of the U.A.M.

ANOVA results show a significant difference in the mean scores for U.A.M. Travel Habits among participants with different income levels (F = 2.805, p = 0.026). This result shows that the income level of individuals affects their U.A.M. travel habits factor. As a result of the Tukey test, it was found that participants with higher income levels had higher levels of acceptance regarding the U.A.M. Travel Habits factor.

Regarding U.A.M. payment intention, the analysis shows a significant difference in average payment intention scores between various income levels (F = 3.394, p = 0.010). As a result of the Tukey test, it was found that participants with higher income levels had higher levels of acceptance regarding the UA.M. payment intention dimension.

Table 7. Anova Test Results According to Age Variable

Factors	Age	Mean	Standard Deviation	f	p
Intention to Use K.H.T	18-25 years old	3,6856	,85351	,998	,408
	26-35 years old	3,6062	,89534		
	36-45 years	3,8706	,83157		
	46-55 years	3,7714	1,12614		
	56 years and above	3,3000	1,53490		

U.A.M. Advantages	18-25 years old	3,7114	,94023	,141	,967
	26-35 years old	3,7380	,89920		
	36-45 years	3,6810	,93821		
	46-55 years	3,8500	,98195		
	56 years and above	3,5714	1,29321		
U.A.M. Travel Habits	18-25 years old	2,9137	,92818	3,245	**,012**
	26-35 years old	3,1512	,89967		
	36-45 years	3,2857	,99237		
	46-55 years	3,3214	,98756		
	56 years and above	3,6548	1,20226		
U.A.M. Payment Intention	18-25 years old	3,6706	,75812	2,086	,082
	26-35 years old	3,7177	,76913		
	36-45 years	3,8847	,78724		
	46-55 years	4,1730	,62832		
	56 years and above	3,5020	1,32845		

Table 7 presents the results of an analysis of variance (ANOVA) conducted to assess whether participants' age groups have a significant impact on their responses to four different factors related to U.A.M.: Intention to Use U.A.M., U.A.M. Advantages, U.A.M. Travel Habits, and U.A.M. Payment Intention. The ANOVA results show no statistically significant difference in mean intention scores among participants of different age groups ($F = 0.998$, $p = 0.408$). This implies that participants' age does not appear to significantly influence their intention to use U.A.M. For the factor of U.A.M. Advantages, the analysis reveals no significant difference in mean advantage scores among participants in different age groups ($F = 0.141$, $p = 0.967$). This suggests that age is not a significant factor in shaping participants' perceptions of the advantages of U.A.M.

The ANOVA results indicate a significant difference in mean scores for U.A.M. Travel Habits among participants in different age groups ($F = 3.245$, $p = 0.012$). Post hoc tests can be conducted to explore specific differences between age groups. This implies that individuals' age does have an impact on their travel habits related to U.A.M. Regarding U.A.M. Payment Intention, the analysis shows no statistically significant difference in mean payment intention scores among participants of different age groups ($F = 2.086$, $p = 0.082$). Although the p-value is close to the significance threshold, it does not reach the conventional level of significance ($p < 0.05$). This suggests that age may not be a significant factor in influencing participants' intentions regarding payment for U.A.M. services.

Conclusion

The results of this study provide valuable insights into the influence of demographic factors on the acceptance patterns of Urban Air Mobility (U.A.M.). The research aimed to determine differences in the acceptance of U.A.M. based on demographic variables such as gender, marital status, education level, income, and age.

Factor analysis revealed that perceptions of U.A.M. encompassed four primary dimensions. These factors are "intentions to use U.A.M.", " U.A.M. advantages", " U.A.M. travel habits" and "U.A.M. payment intention". Upon examination, it was found that the local population showed a remarkably high level of agreement on the dimensions of intention to use U.A.M., U.A.M. advantages, and U.A.M. payment intention.

As part of this research, an in-depth investigation was undertaken to determine whether attitudes toward U.A.M. factors showed any significant differences in the demographic profile of the participants. The results suggested that there weren't any significant differences in the acceptance of U.A.M. factors in terms of gender, education, or marital status. However, participants' income levels revealed statistically significant differences in U.A.M. advantages, U.A.M. travel habits, and U.A.M. payment intentions. These results indicate that individuals with higher income levels have more favorable attitudes towards U.A.M. advantages, U.A.M. travel habits, and U.A.M. payment intentions compared to individuals with lower income levels.

These findings may be due to differences in lifestyle choices and economic circumstances between different income groups, which may influence their perceptions of U.A.M. It's plausible that individuals with higher incomes may have more flexible travel preferences or be more inclined to invest in U.A.M. services, leading to a more positive attitude towards its benefits, travel habits, and willingness to pay. According to the results, U.A.M. travel habits differ according to the age of the participants. Older participants have a higher acceptance of the U.A.M. Travel Habits factor.

Furthermore, income level may be a determining factor in U.A.M. acceptance. Those with higher incomes may perceive the benefits of U.A.M. more willing to pay the additional costs associated with such services. It's therefore conceivable that the effect of income level on U.A.M. acceptance could be linked to lifestyle preferences, economic capabilities, and the perceived cost-benefit analysis associated with this mode of transport. Understanding these subtleties could be key to the development of targeted strategies for the promotion and widespread adoption of U.A.M., tailored to the different socio-economic strata within the population.

Discussion

In summary, this study aligns with prior research in acknowledging the significant potential of Urban Air Mobility (U.A.M.) in addressing urban transportation challenges. The findings of this study, coupled with insights from existing literature, reinforce the promise of U.A.M. as an innovative solution for reshaping urban mobility. It emphasizes the importance of demographic factors, such as gender, marital status, education level, income, and age, in shaping U.A.M. perception and intentions. Similar to the study by Chauhan & Carroll's work (2021), it underscores the need to consider human factors in U.A.M. operations, which aligns with this study's focus on demographic variables.

Additionally, the multifaceted approach to U.A.M. acceptance discussed by Straubinger et al. (2021) corresponds with this study's exploration of U.A.M.'s potential impact on various demographic groups. The study by Fu et al. (2019) on user preferences aligns with the focus on demographic factors, emphasizing the influence of age and income. Altogether, this research contributes by providing nuanced insights into the role of demographics in understanding U.A.M. acceptance and offers valuable implications for urban transportation policies and the promotion of U.A.M. services.

Recommendations

The relationship between age and travel habits affects the approach of different age groups to urban air mobility. Accordingly, awareness campaigns and targeted use scenarios can be developed for different age groups. In addition, although the effect of education level on perceptions appears to be limited, it is important to investigate its effect on general social acceptance and to implement educational programs to raise awareness.

Additional Information/Author Declarations

Statement of Research and Publication Ethics	The authors declare that the data subject to the research were collected in 2019. Therefore, ethics committee permission was not requested.
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References

Al Haddad, C., Chaniotakis, E., Straubinger, A., Plötner, K., & Antoniou, C. (2020). Factors affecting the adoption and use of urban air mobility. *Transportation Research Part A: Policy And Practice*, *132*, 696-712.

Altunışık, R., Coşkun, R., Bayraktaroğlu, S., & Yıldırım, E. (2010). *Sosyal bilimlerde araştırma yöntemleri: SPSS uygulamalı* (6. Baskı). Sakarya Yayıncılık.

Baur, S., Schickram, S., Homulenko, A., Martinez, N., & Dyskin, A. (2018). *Urban air mobility: The rise of a new mode of transportation*. Roland Berger Focus.

Chauhan, B. B., & Carroll, M. (2021). Human factors considerations for urban air mobility. *In 21st International Symposium on Aviation Psychology*, 7-12, Corvallis, USA.

Choi, J. K., & Ji, Y.G. (2015). Investigating the importance of trust in adopting an autonomous vehicle. *International Journal of Human-Computer Interaction*, *31*(10), 692-702.

Dağ, T., Ünler, T., Çopur, E. H., & Çakın, U. (2022). Kentsel hava taşımacılığında kullanılacak dikey iniş-kalkış kabiliyetine sahip bir hava aracının kavramsal tasarımı ve menzil hesabı. *Konya Mühendislik Bilimleri Dergisi*, *10*(3), 649-664.

Edwards, T. E., Verma, S., & Keeler, J. (2019). Exploring human factors issues for urban air mobility operations. *AIAA Aviation 2019 Forum* (p. 3629). Dallas, USA.

Federal Aviation Administration. (2020). *Urban air mobility*. NASA.

Fu, M., Rothfeld, R., & Antoniou, C. (2019). Exploring preferences for transportation modes in an urban air mobility environment: Munich case study. *Transportation Research Record*, *2673*(10), 427-442.

Garrow, L. A., German, B. J., & Leonard, C. E. (2021). Urban air mobility: A comprehensive review and comparative analysis with autonomous and electric ground transportation for informing future research. *Transportation Research Part C: Emerging Technologies*, *132*, 103377.

Gillis, D., Petri, M., Pratelli, A., Semanjski, I., & Semanjski, S. (2021). Urban air mobility: A state of art analysis. In O. Gervasi, B. Murgante, S. Misra, C. Garau, I. Blečić, D. Taniar, B. O. Apduhan, A. M. A. C. Rocha, E. Tarantino, & C. M. Torre (Eds.), *Computational science and its applications, 21st International Conference, Proceedings, Part II* (p. 411-425). Cagliari, Italy.

Grandl, G., Cachay, J., Ross, H., Salib, J., Ostgathe, M., Doppler, S. (2018). *The future of vertical mobility sizing the market for passenger, inspection, and goods services until 2035*. https://fedotov.co/wp-content/uploads/2018/03/Future-of-Vertical-Mobility.pdf retrieved on 18 May 2021.

Graydon, M., Neogi, N. A., & Wasson, K. (2020). Guidance for designing safety into urban air mobility: Hazard analysis techniques. *Proc. AIAA SciTech Forum* (p. 2099). Orlando, USA.

Johnson, R. A., Miller, E. E., & Conrad, S. (2022). Technology adoption and acceptance of urban air mobility systems: Identifying public perceptions and integration factors. *The International Journal of Aerospace Psychology*, *32*(4), 240-253.

Kasliwal, A., Furbush, N. J., Gawron, J. H., McBride, J. R., Wallington, T. J., De Kleine, Kim, H. C., & Keoleian, G. A. (2019). Role of flying cars in sustainable mobility. *Nature Communications*, *10*(1), 1555. https://doi.org/10.1038/s41467-019-09426-0

Kim, Y. W., Lim, C., & Ji, Y. G. (2023). Exploring the user acceptance of urban air mobility: extending the technology acceptance model with trust and service quality factors. *International Journal of Human-Computer Interaction*, *39*(14), 2893-2904.

Kyriakidis, M., Happee, R., & de Winter, J. C. (2015). Public Opinion on Automated Driving: Results of an International Questionnaire Among 5000 Respondents. *Transportation Research Part F: Traffic Psychology and Behaviour*, *32*, 127-140. https://doi.org/10.1016/j.trf.2015.04.014

Özdamar, K. (1999). *Paket programlar ile istatistiksel veri analizi*. Kaan Kitabevi.

Postorino, M. N., & Sarné, G. M. (2020). Reinventing mobility paradigms: Flying car scenarios and challenges for urban mobility. *Sustainability*, *12*(9), 3581. https://doi.org/10.3390/su12093581

Preis, L. (2020). *Concept of operations for urban air mobility: A generic development approach*.

Shaheen, S., Cohen, A., & Farrar, E. (2018). *The Potential Societal Barriers of Urban Air Mobility (UAM)*. UC Berkeley: Transportation Sustainability Research Center. https://doi.org/10.7922/G28C9TFR

Straubinger, A., Michelmann, J., & Biehle, T. (2021). Business model options for passenger urban air mobility. CEAS Aeronautical Journal, *12*(2), 361-380.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2013). *Using multivariate statistics*. Pearson.

Thipphavong, D. P., Apaza, R., Barmore, B., Battiste, V., Burian, B., Dao, Q., Feary, M., Go, S., Goodrich, K. H., Homola, J., Idris, H. R., Kopardekar, P. H., Lachter, J. B., Neogi, N. A., Kwan, H., Oseguera-Lohr, R. M., Patterson, M. D., & Verma, S. A. (2018). Urban Air Mobility Airspace Integration Concepts and Considerations, *2018 Aviation Technology, Integration, and Operations Conference*. Atlanta, Georgia. https://doi.org/10.2514/6.2018-3676

Tuncal, A., & Uslu, S. (2021). Kentsel hava hareketliliği kavramının gelişiminde iki önemli faktör: ATM ve toplum. *Karamanoğlu Mehmetbey Üniversitesi Sosyal ve Ekonomik Araştırmalar Dergisi*, *23*(41), 564-577.

Vascik, P. D. (2020). *Systems analysis of urban air mobility operational scaling* [Doctoral dissertation]. Massachusetts Institute of Technology.

Wang, S., Jiang, Z., Noland, R. B., & Mondschein, A. S. (2020). Attitudes towards privately owned and shared autonomous vehicles. *Transportation Research Part F: Traffic Psychology and Behaviour*, *72*, 297-306.

Yavaş, V., & Tez, Ö. Y. (2021). Kentsel hava taşımacılığı kabul ve kullanım modeli: Bir ölçek geliştirme çalışması. *Journal of Aviation Research*, *3*(2), 279-298.

Yedavalli, P., & Mooberry, J. (2019). An assessment of public perception of urban air mobility (UAM) Airbus, Leiden, The Netherlands, Tech. Rep.

Yılmaz, A., & Ulvi, H. (2022). Kentsel hava sahasında insansız hava aracı sistemleri trafik yönetimi için verilmesi gereken hizmetler ve kullanılabilecek bazı teknolojiler. *Türkiye İnsansız Hava Araçları Dergisi*, *4*(1), 8-18.