

The post-COVID emergence of dark kitchens: a qualitative analysis of acceptance and the advantages and challenges

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ABSTRACT: This article is an attempt to understand the perspective of various stakeholders regarding the current emergence of dark kitchens/cloud kitchens in the hospitality industry of Dubai, UAE. The researchers analyse the qualitative data collected after interviewing seven stakeholders. The data provides an in-depth insight into their views related to the emergence of dark kitchens in the post-COVID period, their acceptance in the industry and by customers, their advantages and their limitations. A content analysis approach was used, and prominent themes were identified. It shows that dark kitchens have come as a saving grace to the fledgling hotel industry after the pandemic. Dark kitchens have been found to support restaurants during and after the pandemic by saving costs and space; however, this comes with its own set of challenges. The researchers outline these in detail in the article and discuss the limitation this current trend is facing. Some recommendations and suggestions on the basis of the input from the stakeholders are also made. This study can be considered a significant preliminary contributor in the emerging topic of dark kitchens for academics, hoteliers and all related stakeholders.

Keywords: cloud kitchen, F&B industry, innovation in the F&B industry, outsource kitchen

Introduction

Dark kitchens have become an increasingly popular concept in the food and beverage industry, particularly in the wake of the COVID-19 pandemic. This trend has been studied extensively by researchers around the world, including Susilowati et al. (2021) who conducted a case study in Jakarta to analyse the development of cloud kitchens in the industry. Similarly, Fridayani et al. (2021) explored cloud kitchens as a strategy for growth in Indonesian culinary businesses during and after the recent pandemic. In 2019, Choudhary conducted a strategic analysis of cloud kitchens, providing a case study on the topic. These studies shed light on the growing significance of cloud kitchens and their potential as a viable business model in the food industry. Dark kitchens, also known as virtual kitchens, cloud kitchens, or ghost kitchens, have gained popularity in the food and beverage industry in Dubai in recent years.

Dubai's food and beverage (F&B) industry has experienced remarkable growth and transformation in recent years, owing to factors such as a rapidly expanding population and a thriving tourism sector. According to Al-Haddad and Al-Braik (2021), Dubai's F&B sector has become one of the most dynamic and competitive industries in the region, with a diverse culinary landscape, innovative dining concepts and a favourable regulatory environment. The industry has attracted a growing number of international brands and franchises, as well as local entrepreneurs and start-ups, creating a vibrant and diverse food scene (Ali et al., 2020). However, the COVID-19 pandemic posed

unprecedented challenges for the F&B industry in Dubai, with many businesses facing closure or financial hardship (Zhang & Alkhars, 2021).

In recent years, the food and beverage (F&B) industry in Dubai has undergone a significant transformation, with an increasing number of restaurants opting to operate without a physical dining space. These are commercial kitchens that operate solely for food delivery and do not have a physical venue for customers to dine in.

According to a report by KPMG (2021), the dark kitchen trend has been growing rapidly in Dubai due to the rise of food delivery services and the increasing demand for convenience for consumers. The report also states that the COVID-19 pandemic accelerated the growth of dark kitchens, as more people are ordering food for delivery and staying home. This has led to a growing interest in exploring the benefits of dark kitchens for the Dubai F&B industry and the costs associated with their operation.

The rationale for this research is to shed light on the potential (dis)advantages that dark kitchens offer to the F&B industry in Dubai. As noted by Li et al. (2020), the emergence of dark kitchens is changing the traditional restaurant business model by reducing the overhead costs associated with maintaining a physical location. Additionally, they offer greater flexibility in terms of menu offerings and can quickly adapt to changing consumer preferences. However, despite the potential benefits, there is a need to understand the costs associated with operating dark kitchens in Dubai, including regulatory requirements, labour and technology expenses.

Therefore, this research aims to explore the benefits of dark kitchens to the Dubai F&B industry and analyse the costs of operating such establishments. The study involves a comprehensive review of existing literature on dark kitchens and an empirical investigation of the operational costs of selected dark kitchens in Dubai. Additionally, the study will provide a background to the F&B industry in Dubai, highlighting the current trends and challenges faced by restaurants in the region.

The significance of this study lies in its potential to inform policymakers, entrepreneurs and investors on the benefits and costs of operating dark kitchens in Dubai. By understanding the economic implications of this emerging business model, stakeholders can make informed decisions regarding investment, regulation and innovation in the F&B industry. Furthermore, the study will contribute to the existing literature on dark kitchens by providing empirical evidence from the Dubai context, which has not been extensively studied to date.

Literature review

Dark kitchens, also known as ghost kitchens or virtual kitchens, are commercial kitchen spaces designed for food delivery and catering services, without a traditional dine-in restaurant component. The concept of dark kitchens dates to the early 2010s when food delivery apps such as Uber Eats, Deliveroo and *Thuisbezorgd* began to gain popularity (Cai et al., 2022). According to a study by Euromonitor, the global food delivery market was worth \$35 billion in 2019, and it is expected to reach \$365 billion by 2030 (Euromonitor, 2019). As a result, the demand for dark kitchens has been increasing rapidly, and many food companies and restaurant chains have started to adopt this model to expand their delivery services (Dsouza & Sharma, 2021).

The COVID-19 pandemic also accelerated the growth of dark kitchens, as the restrictions on dine-in services forced many restaurants to rely solely on delivery and takeout/takeaway orders (Nigro et al., 2023). According to a report by Euromonitor (2021), the pandemic is expected to have a long-term impact on the foodservice industry, and dark kitchens are likely to become an essential part of the industry's future. Dark kitchens have become a popular and rapidly growing trend in the foodservice industry. With the increasing demand for food delivery services and the impact of the COVID-19 pandemic, the future of the industry is likely to be shaped by the continued growth of dark kitchens.

According to a study completed by Tennant et al. (2020), dark kitchens are a growing trend in the restaurant industry, with the potential to reduce costs and increase profits for operators. The authors note that dark kitchens can offer a variety of benefits, including lower rental costs compared to traditional restaurants, lower staffing costs and the ability to operate multiple brands out of the same kitchen.

Tuomi and Tussyadiah (2020) found that dark kitchens can provide a more efficient and streamlined experience for customers, as they can offer faster delivery times and more customised menu options. The authors also note that dark kitchens can help to reduce food waste, as they can better predict demand and adjust production accordingly. However, there are also potential drawbacks to the dark kitchen model. A study published in the *International Journal of Hospitality Management* found that dark kitchens may struggle to maintain consistent quality and customer satisfaction due to the lack of

face-to-face interactions with customers (Belarmino et al., 2021). The authors also note that dark kitchens may face challenges with food safety and regulatory compliance.

Overall, the evolution of dark kitchens has been driven by a combination of technological advances, changing consumer preferences and economic pressures. While there are benefits to this model, it is important for operators to carefully consider the potential drawbacks and ensure that they can maintain high levels of quality and safety.

Acceptance of dark kitchens in the F&B industry

Hakim et al. (2022) conducted a study in Brazil to investigate consumers' perceptions of deliver-only restaurants using food delivery apps. The study found that consumers are generally positive towards the concept of dark kitchens, with convenience being the primary reason for their acceptance. However, consumers also expressed concerns regarding food safety and quality, which could affect their willingness to order from dark kitchens. The study provides valuable insights into consumers' perceptions and concerns regarding dark kitchens, which could help operators improve their services and better address customer needs.

Darekar et al. (2020) conducted a study in India to investigate customers' awareness and perceptions of dark kitchens. The study found that most customers were not aware of the concept of dark kitchens and their potential benefits. However, once they were informed about the concept, they showed a positive attitude towards it, primarily due to the convenience and faster delivery times. The study highlights the need for operators to increase customer awareness of dark kitchens, and their benefits, to improve customer acceptance.

Studies highlight the role of dark kitchens in meeting the growing demand for food delivery services and improving operational efficiency. The research also discusses the potential benefits and challenges of dark kitchens, such as reduced overhead costs and the need for proper food safety and quality control measures. Researchers have provided a broader perspective on the emergence of dark kitchens and their potential impact on the restaurant industry (Khan, 2020; Ramos, 2022).

Overall, these studies provide valuable insights into the acceptance of dark kitchens from different perspectives, including customers' perceptions and concerns, the need for increased awareness and the potential benefits and challenges of the concept. Khan's (2020) study highlights the need for operators to address customer needs and concerns and to implement proper food safety and quality control measures to improve customer acceptance and satisfaction.

Hakim et al.'s (2022) study in Brazil found that consumers preferred to order from traditional restaurants with a physical presence rather than dark kitchens. However, consumers who had ordered from dark kitchens reported positive experiences, especially regarding convenience and affordability. Khan (2020) examined the impact of technological disruptions in the restaurant industry, including the emergence of dark kitchens. The study found that innovations in food delivery services, including dark kitchens, have led to increased customer satisfaction and loyalty. Davies (2021) discussed the concept of dark kitchens and their impact on the foodservice industry. The author argued that dark kitchens are an opportunity for traditional restaurants to expand their delivery services and

reach a wider audience. Giousmpasoglou et al. (2023) examined the issue of worker exploitation in the gig economy, specifically in dark kitchens. The study found that workers in dark kitchens face low wages, long working hours and poor working conditions, leading to higher staff turnover rates than in traditional F&B sectors.

Davies (2021) notes that the lack of physical space in dark kitchens can be a challenge for chefs and staff, who may have to work in cramped and sometimes hazardous conditions. This can lead to decreased job satisfaction and potential safety issues. Giousmpasoglou et al. (2023) highlight the issue of worker exploitation in the gig economy, which includes dark kitchens. Workers in these kitchens are often classified as independent contractors which means they do not receive the benefits or protections afforded to traditional employees. This can lead to low wages and poor working conditions, including long hours and no job security. Although there are several criticisms of dark kitchens by various researchers, a positive side was also found by other studies.

Hakim et al. (2022) found that customers appreciate the convenience and flexibility of ordering food from these kitchens. Dark kitchens can operate in areas where traditional restaurants may not be feasible due to high rent or limited space. This allows businesses to reach a wider customer base and increase their revenue. Furthermore, Darekar et al. (2020) also found that customers value the speed of service and the ability to customise their orders when ordering from dark kitchens. The authors suggest that dark kitchens can improve the efficiency of food delivery services and reduce waiting times for customers. Khan (2020) argues that technological innovations in the food industry, including the rise of dark kitchens, have the potential to increase profitability for businesses by reducing overhead costs associated with traditional restaurant operations.

Overall, dark kitchens offer several advantages, including increased convenience, flexibility and revenue potential for businesses. However, there are also potential disadvantages, including the challenges of working in limited physical space and the risk of worker exploitation. To maximise the benefits of dark kitchens, it is essential to address these challenges and ensure that workers are treated fairly and with respect.

Giousmpasoglou et al. (2023) focus on the issue of worker exploitation in dark kitchens, where many workers are classified as independent contractors and lack basic employment rights and protections. The authors argue that the gig economy model of dark kitchens creates a power imbalance between workers and companies, leading to low pay, long hours and poor working conditions. Their article highlights the ethical concerns associated with the cost and feasibility of operating dark kitchens.

Shapiro (2023) explores the concept of platform urbanism in the context of the COVID-19 pandemic. Platform urbanism is a term used to describe the growing trend of digital platforms and technologies to shape urban spaces and activities. According to Shapiro (2023), platform urbanism involves the use of digital platforms to facilitate various aspects of urban life, including transportation, commerce and social interactions. The COVID-19 pandemic accelerated the growth of platform urbanism, as more people turned to digital platforms to work, shop and socialise from home., Shapiro (2023) examines the implications of platform urbanism for urban planning and design, as well as the potential benefits and drawbacks of this trend for urban

residents. The author argues that dark stores/shops and ghost kitchens have become a crucial part of the logistical urban frontier, as they provide an efficient and cost-effective solution for food delivery. Negative effects of platform urbanism can include the displacement of local businesses and the exploitation of workers. Ahuja et al. (2021) provide an overview of the rapid evolution of food delivery and the impact of COVID-19 on the industry. The authors argue that dark kitchens have become a key strategy for restaurants and food companies to expand their delivery services and reach new customers. The article highlights the benefits of dark kitchens, such as lower overhead costs and increased flexibility, but also acknowledges the challenges of managing multiple brands and ensuring food safety and quality.

Festivalia and Swantari (2022) focus on the use of the ghost kitchen strategy to reduce restaurant losses in the COVID-19 pandemic. The authors argue that dark kitchens can help restaurants adapt to the changing market conditions and reduce the risk of financial loss. Festivalia and Swantari present a case study of a restaurant in Bali that successfully implemented a ghost kitchen strategy and increased its revenue during the pandemic. In another study, by Giousmpasoglou et al. (2023), worker exploitation in the gig economy with a focus on dark kitchens is examined. The authors highlight that dark kitchens rely heavily on gig workers, who are often underpaid and overworked. This suggests that the cost of labour in dark kitchens is relatively low, which makes it feasible for operators to offer affordable prices to customers. However, this raises ethical concerns around the exploitation of workers and the need for fair working conditions.

In conclusion, the literature suggests that dark kitchens offer a cost-effective and feasible way of expanding food delivery services and reducing the cost of rent and overheads. However, it raises ethical concerns around worker exploitation and the need for fair working conditions. Further research is needed to explore these issues and ensure that dark kitchens operate ethically and sustainably. To that end, this article addresses the following questions:

- RQ1: What are your thoughts about the emerging concept of dark kitchens and why is it better for upcoming restaurants and existing restaurants to join/have a dark kitchen?
- RQ2: What is your opinion about the acceptance of dark kitchens in Dubai?
- RQ3: What are the advantages of operating a dark kitchen when compared with traditional restaurants?
- RQ4: How would you analyse and determine the challenges of running a dark kitchen in Dubai and how do you overcome them?

Research methodology

We used primary data and qualitative analysis to generate the findings of this research work. The prime objective of selecting a qualitative study is that it focuses on non-numerical data such as descriptions, concept definitions, metaphors, meanings and characteristics to explain the "why" rather than the "what" (Berg & Lune, 2014). As per Creswell (2014), using a qualitative approach helps the researcher with a better exploration of the topic, as well as gathering all the different viewpoints of industry experts and other participants. Stakeholders and prominent members of the dark kitchens in the Dubai area were interviewed via online platforms, specifically Zoom. One pilot interview was

done to identify any issues with the questions and to remove any vague or confusing questions. Semi-structured interviews were conducted over Zoom as such methods afforded the interviewer the flexibility of simplifying the questions in the process. The key advantage of data gathered through a semi-structured interview is that it is comparable and can lead to interactive discussions (Keller & Conradin, 2018). In-depth interviews were conducted with restaurant owners, existing dark kitchen operators and industry experts. A purposive sampling technique was used in which the researcher selects the participants according to their position and demographics, allowing the researcher to collect in-depth information and reliable data. In this case, the interviewees were selected on the basis of stakeholder position, expertise in the field, number of years of experience and position held in the restaurant. A total of 20 persons were contacted, out of which seven consented to be interviewed. The interviewees were provided with a list of questions prior to the actual interview so that they could be more familiar with the questions. This led to richer and more in-depth information.

An exploratory approach was taken and the data was analysed manually to get the advantage of the interpretive approach. We tried to be immersive throughout the whole process and to present a more interpretative result. This analysis of the verbatim transcripts helped us to find the similarities and differences between the individual answers given by the respondents.

We used a generic version of the content analysis strategy propounded by Creswell (2014). According to this method, all the information gathered through interviewees (restaurant owners, chefs and industry experts) was organised and transcribed into a text format. Then, the overall data was carefully read through numerous times to get a thorough understanding of the participant's responses. Then, the relevant codes and themes were generated. Coding is the "process of organizing the material into chunks or segments of text before bringing meaning to information" (Rossman and Rallis, 2017, p. 20). The most common keywords found in the transcripts were arranged into groups. These keywords/codes were then abstracted into themes and sub-themes according to the research objectives. Finally, the meaning of all such themes was interpreted. Qualitative research is best described as "interpretative research" (Creswell, 2014). We first structured and presented the interview data and then tried to interpret the meaning of this coded data against the backdrop of the present information and compared it with the information gathered from the literature to find the meaning of the themes.

Creswell (2014) pointed out that the qualitative data gathered must be checked for credibility, dependability and confirmability. To ensure these, different sources were used to identify the related theories, and the literature review was used to form the basis of the research objectives and research questions. With permission from the interviewees, the interviews were recorded and then transcribed. Themes identified and saved from the transcripts were tested for regularity between different participants to ensure saturation was met. The concept of saturation was developed by Glaser and Strauss in 1967 (Glaser & Strauss, 2017). In qualitative data analysis, saturation is defined as a "point in data collection when no additional insights are identified and data begins to repeat, making further data collection redundant (Hennink et al., 2017, p. 592). Even though having a large sample size is preferable, in some cases, typically six or seven interviews can capture a

majority of the themes (Guest et al., 2006). The notes compiled according to the questions asked and the transcribed answers of the interview questions were the basis of drawing the results. The transcript was used to identify the keywords which gave an idea of the status of dark kitchens in Dubai, their acceptance, advantages and the challenges faced by the operators there. All the interviews were conducted and transcribed in English.

Data analysis and findings

Before forming themes and sub-themes gathered through the primary data, insights on the participant's demographics (occupation and stakeholder position) are portrayed in Table 1. A total of 20 stakeholders were contacted as potential interviewees, out of which only seven responded and agreed to take a part in this study. Out of the seven interviewees, three were executive chefs, three restaurant owners and one was a dark kitchen operator. Demographic information gathered from the participants included their stakeholder position and occupation only, as nationality, age and other information were not deemed necessary for this research study.

The participants were carefully chosen depending on their professional occupation, resulting in a proportion of 43% executive chefs, 43% restaurant owners and 14% for the dark kitchen operator/employee.

Through a thorough examination of the interviews, we analysed them on the basis of a "coding template" in which a priori themes are identified and the analysis was done to find the answers to the research questions. Four major themes were identified as important in the data set and were further organised in a meaningful and useful manner.

Thoughts on the dark kitchen, acceptance, challenges of operating a dark kitchen and advantages of a dark kitchen

After collecting and analysing the primary data, we were successful in identifying four major themes based on the interviewees' responses. The four major themes are supported and linked directly by sub-themes, which are linked to related themes. The prime objective of pooling the main key words together was to have a better understanding of the participants' answers regarding the research topic: "Is the concept of dark kitchens feasible in Dubai and how can existing restaurants benefit from it?"

Thoughts on dark kitchens/virtual restaurants are directly supported by the following words: *future of the F&B industry, game changer, and cheap or feasible*. The acceptance of dark kitchens is reflected in this statement from a respondent:

Yes, total acceptance will take time but restaurants will gradually embrace it, restaurant owners need to be educated about dark kitchens, chefs and entrepreneurs are going to love it.

TABLE 1: Interviewees' demographic profiles

Participants	Occupation	Stakeholder position
P1	Restaurant owner	Founder
P2	Restaurant owner	Co-founder
P3	Chef	Executive chef
P4	Restaurant owner	Founder
P5	Chef	Industry expert (lecturer) & chef
P6	Chef	Head chef
P7	Dark kitchen	Sales manager

Challenges with dark kitchens are supported by the following subthemes: online marketing; low profit margins; dependent on third-party applications (apps; Zomato, Uber Eats, and Deliveroo); low barrier of entry; and technology. Advantages of dark kitchens/virtual restaurants are supported by the following sub-themes: entrepreneurs and chefs can pursue their dreams; low operating costs; minimal investment; and higher sales.

Thoughts on the dark kitchen

Throughout all the interviews and with all the participants, the concept of a dark kitchen/virtual restaurant was well known. The keywords *dark kitchen* occurred numerous times throughout different stakeholder interviews. When asked about their opinion regarding dark kitchens in the UAE and especially in Dubai, 86% of the participants were confident that dark kitchens would be a game changer and would have its own set of pros and cons. The theme "Thoughts on the dark kitchen" directly relates to the research question and the first research objective. One of the participants, P6 said: *"The concept of a dark kitchen is an opportunity for entrepreneurs and can cause severe damage to the current restaurant industry"*.

The main reason behind this response was due to the low market barrier allowing more competition to enter the market, hence resulting in intense competition. One of the restaurant owners (P2), also went on to say: *"Restaurants who do not adapt and step up their marketing and service standards will eventually run out of business or would need to cut down their operating costs by at least 20%"*. Entrepreneurs will now finally be able to open their restaurants at a very low cost and try out their concept restaurant before opening a so-called brick-and-mortar outlet.

Acceptance of the dark kitchen

The prime objective of this theme is to understand whether the current F&B industry are going to accept and support the idea of the dark kitchen. The keywords "emerging" and "acceptance" occurred several times throughout the interviews. This theme directly relates to the first half of the research question "Is the concept of dark kitchens feasible in Dubai?". The data collected for this theme directly suggested that fine dining restaurants will not support this idea as it can further decrease the number of patrons in their restaurants. One of the interviewees (P1) said: *"Hmmm, the best types of restaurants to target will be the fast-casual dining restaurants and the fast food restaurants due to their cheap menus and high popularity"*.

With regard to restaurants accepting the concept of the dark kitchen, two of the interviewees, P3 and P7 respectively, suggested that *"It will take some time, but eventually the restaurants owners will embrace the idea of Dark kitchens"*, and *"If the concept of a dark kitchen is to become successful, they need to make sure to educate the restaurant owners to convince them of this idea. Because this is a very new idea for them and some of the owners might not understand the whole concept"*.

Challenges with dark kitchens

The prime objective of this question was to classify and identify possible challenges that restaurants might face when managing a dark kitchen and how they can overcome these challenges. Most of the restaurant owners and chefs mentioned issues related to high dependency on online marketing, low profit

margins, dependency on third-party applications (Zomato, UberEATS, and Deliveroo), low barriers of entry and technology. These are discussed in detail as follows:

- Dependency on online marketing: All seven participants mentioned that one of the biggest challenges that dark kitchens will face is that their only mode of reaching their customers is through digital media.

Restaurants need to be very active on their social media pages, especially Facebook and Instagram (P7).

However, two participants also said: *"Nowadays, the industry has completely shifted towards digital marketing, so I don't think so it will be a special challenge only for dark kitchen operators"* (P5); and interviewee (P4) also reiterated that *"Even current restaurants have to be heavily active on social media, so it's a challenge for the whole industry if they want to get successful, not only dark kitchen restaurants"*.

- Technology: During the interview one participant (P6) brought attention to how important technology is in this whole system.

Dark kitchen restaurants depend heavily on technology and when there is an error it can cost them the whole business day as it will lead to no business.

- Low profit margins and a low barrier of entry: During the interviews one of the interviewees (P3) mentioned that *[a] lot of new concepts will be seen because of not needing the heavy capital anymore, but that will also mean that restaurants need to price their menu carefully because if the prices are a lot, people will not order.*

- Dependency on third-party applications: One participant (P2) drew attention to the following: *"Dark kitchen restaurants will be stuck and will be only dependent on the sales of Zomato, Deliveroo, Talabat, and other aggregators without their support, the restaurant will run out of business"*. Another participant (P1) also said: *"Now that the dark kitchen is in Dubai, these aggregators will even charge extra because they understand that restaurants are more dependent on them so they can charge extra in commissions and marketing on their platforms"*.

In contrast, dark kitchen operators and some restaurant owners also expressed the following opinions:

Food delivery has been around for a while: "Restaurants are already highly dependent on these aggregators as food deliveries became a norm in the industry and restaurants who did not adapt to that cannot sustain this business (P2).

Dark kitchens are just going to help restaurants to cut down their costs and get higher returns as they are already paying commissions and advertisement costs to aggregators (P5).

Advantages of dark kitchens

The prime objective of asking this question to all stakeholders was to identify the differences and similarities among their views with regard to the advantages of dark kitchens. The keyword "advantages" occurred several times. This theme helps us to answer the second half of the research question "How can existing restaurants benefit from it (i.e. a dark kitchen)?".

Chefs listed the shadowing advantages of dark kitchens/virtual restaurants:

- Entrepreneurs and chefs can pursue their dreams: Chefs agreed that dark kitchens are the way forward as it opens doors to plenty of opportunities for chefs and entrepreneurs who want to have their own restaurants. One of the participants (P2) said: *"a dark kitchen is a gateway to a new world where chefs will finally be able to open their own restaurants and run them"*.
- Low operating cost: Chefs, and throughout all the interviews, all the stakeholders agreed that dark kitchens will reduce operating costs considerably. Participant (P5) said: *"A dark kitchen will easily cut down 70% to 80% of the operating costs and restaurants can use that money to market their business better"*.

Dark kitchen operators and restaurant owners listed the following advantages of dark kitchens/virtual restaurants:

- Minimal investment: Restaurant owners and dark kitchen operators have similar views regarding the advantages of dark kitchens. One of the participants (P7) said:

Dark kitchens will be a perfect place where restaurants can try out new concepts and see what the response is and they don't even have to pay for maintenance of the equipment.

- Higher sales: Regarding this aspect, all the stakeholders had similar viewpoints. Interviewee (P2) said that *dark kitchens will help restaurants target a new location with unmet demands, resulting in higher sales and at a cheaper expansion cost as well*

and participant (P7) said:

Even Starbucks is getting into dark kitchens to decrease their costs and increase their delivery radius, hence getting higher sales.

Discussion and conclusion

It is evident from the findings that all participants were well aware of the concept of dark kitchens/virtual restaurants. Throughout the interviews all the participants had similar thoughts regarding dark kitchens, with most of them saying that the concept of dark kitchens will be very successful in Dubai and is the future of the F&B industry, which is in agreement with Vaughan (2022). Vaughan (2022) justifies this due to the success of dark kitchens/virtual restaurants in the UK and the US markets. Other participants also mentioned that the future potential dark kitchens/virtual restaurants hold the key to change how the industry currently operates. However, one of the participants also mentioned that they see dark kitchens as both an opportunity and a threat to the F&B industry, which is in line with the findings of Yang et al. (2017). Dark kitchen operators were not asked this question as they are the ones providing this service and that could lead to bias regarding their thoughts on dark kitchens. However, industry experts were asked to express their thoughts on dark kitchens; the first thought they had was that this is a great opportunity for entrepreneurs and chefs who have a dream to open their own restaurants. Nevertheless, these viewpoints were contradicted by Yang et al. (2017), who maintained that dark kitchens/virtual restaurants do pose a threat to current restaurants as it will increase competition, which may lead to price wars in the industry.

As far as the acceptance of dark kitchens is concerned, Nair (2020) advocated that restaurants are looking for different ways to reduce their operating costs and, as Gao and Bai (2014) and

Davis et al. (1989) mentioned, if a concept or technology is considered equally useful and easy to apply, consumer feelings about that concept or technology are more positive and hold a higher tendency of being accepted. Interviewees were requested to express their current acceptance levels of dark kitchen/virtual restaurants and to identify if restaurant owners and chefs in Dubai are ready to accept and adopt the concept of dark kitchens. Out of three restaurant owners, two of them expressed that they would be very keen to expand their businesses through dark kitchens for a greater delivery radius and to meet unmet demand, resulting in higher sales, which is in line with findings by Böhm et al. (2019). One of the restaurants wants to rebrand themselves, as they believe a delivery-only restaurant has to keep their prices competitive to run a successful dark kitchen, and the other restaurant wants to promote their current menu and food items to a larger crowd through dark kitchens. These outcomes of primary data findings support the basic reason for expanding and opening dark kitchens as specified in research by Kalargyrou et al. (2018) and Böhm et al. (2019). On the other hand, the third restaurant claimed that they understand the benefits provided by dark kitchens/virtual restaurants, but the importance of interaction with their guests and not being able to nurture their guests to raise customer satisfaction is the prime reason that they would not expand through dark kitchens at this time.

The remaining stakeholders (three executive chefs and one dark kitchen operator) expressed that chefs who dream to have their own restaurants are going to accept this concept with open arms as now they will be able to pursue their dream of running their own restaurant and that food delivery sales were increasing day by day. This element was also identified by Kalargyrou et al. (2018).

When the challenges were discussed with the participants, a number of participants mentioned that the main issue with dark kitchens would be getting people to order food from your restaurant, because not having a physical location where customers can come and dine means that dark kitchen restaurants need to market themselves heavily on social media platforms to be successful. On the other hand, one of the participants, contradicting this, mentioned that businesses currently need to market themselves heavily, whether it is a dark kitchen or a classic physical establishment, due to the high dependency on the internet. This is in line with the findings of Shehata and Montash (2019). One restaurant owner emphasised the fact that in Dubai currently, there are only a few dark kitchen operators, which is one of the key reasons for this service being so expensive in this region. He also mentioned that with dark kitchens/virtual restaurants, technology plays a major role, ranging from the marketing of the business, to managing all the activities related to the business. If there is a failure in technology, it can easily cost the restaurant one full day's business. Furthermore, most of the participants agreed that dark kitchens/virtual restaurants are not a novelty anymore, and are slowly but surely taking over the market as it has done in the USA's and the UK's F&B industry.

While discussing the advantages of operating a dark kitchen, according to chefs, there is considerable potential for them in Dubai, which is in line with the views of restaurant owners and dark kitchen operators. Restaurant owners stress that the concept of dark kitchens/virtual restaurants will help them expand their businesses for minimal investment and further help them to reduce their operating costs by 70% to 80%. The advantages

of dark kitchens/virtual restaurants were already identified by Omer (2020). Most participants agreed that with each year, competition is increasingly causing many restaurants and cafes in Dubai to close down. With the introduction of dark kitchens, restaurants have a new hope to successfully reduce their operating costs by 70 to 80% and at the same time continue growing their businesses. These viewpoints are in line with Deloitte (2019) and further supported that dark kitchens will help businesses cut costs by at least 70%.

Implications, limitations and recommendations for future research

This research study provides a number of implications for the F&B industry. It adds to the existing secondary data by finding the similarities and differences between the viewpoints of restaurant owners, executive chefs, and dark kitchen operators. Furthermore, this study can also be used by future dark kitchen operators, leading them to what types of restaurants to focus on. This research also helps restaurant owners to understand the concept of dark kitchens and how they can reduce their operating costs with higher efficiency and sales. Dark kitchen operators need to educate restaurant owners regarding the concept and how it can benefit their businesses.

The challenges identified in this article relate to the lack of confidence and distrust that the interviewed restaurateurs had. Furthermore, the restaurant owners fear that increasing competition may lead to the restaurants going out of business, or forcing them to cut costs. The fear of the latter will make the restaurants possibly reconsider their potential manpower, quality, or the space that they operate in.

Most of the interviewees were not approached in person; instead, they were contacted through conference-based cloud solutions such as Zoom. Hence, it was difficult to establish a good rapport with the participants and we had to be quite direct for the purpose of the interviews. The participants reflected in detail and offered a contextual view of the COVID-19 pandemic and the emergence of dark kitchens. This set the framework for the discussions that compared and contrasted the available literature with the findings to assess the impact of the dark kitchens on the food and beverage industry.

Based on the findings of this research study, one of the primary recommendations for future researchers would be to use the qualitative research method (interviews) supplemented with quantitative methods, as the information available through reputable journals regarding the concept of dark kitchens is very limited. Thus, it would be highly advisable to conduct a full stakeholder analysis of the concept of dark kitchens to gain a better understanding of the topic. Moreover, a quantitative study would be very interesting to see if the general public had any issues with their food being prepared in dark kitchens or virtual restaurants. Future research could also explore the use of dark kitchens across the UAE and not just the Emirate of Dubai.

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