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Research Paper

Online Shopping Addiction for Food Delivery Apps and Health Risk Behavior Among Emerging Adults

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ABSTRACT

Objectives: This study aims at understanding the patterns of food and instant delivery app use, exploring various socio-demographic factors associated with the frequency of ordering, and the health consequences of compulsive use of these apps and of unhealthy eating. **Methodology:** A cross-sectional study design was employed. 439 emerging adults from Delhi/NCR (224 males and 215 females) between the age range of 18-29 years were selected for the study. The study was quantitative in nature and chi-square, correlation and regression analysis was carried out on the data. **Results:** Zomato (68.1%) and Swiggy (61.0%) were the most used food delivery apps while Blinkit (26.4%) and Instamart (10.0%) were the most used instant delivery apps. Junk/fast food (74.3%) was the most ordered type of food whereas highest frequency of ordering was once a week (67.9%). Majority participants lived alone (64.7%), were financially dependent (79.5%) and preferred paying through UPI (64.5%). Convenience of home delivery (81.5%) was the top reason contributing to app use. Pearson's chi-square showed significant association between the type of living arrangement as well as type of financial situation with frequency of ordering. On the other hand, gender and preferred mode of payment did not show any significant association. Online shopping addiction for ordering through food and instant delivery apps was found to be a significant predictor of unhealthy diet, while physical inactivity was significantly predicted by unhealthy diet. **Conclusion:** This study serves as a reference for consumers to make better nutritional choices by bringing into awareness the possible addictive use of these apps and the health risks associated with it.

Keywords: *Emerging Adults, Food Delivery Apps, Health Risk Behavior, Online Shopping Addiction*

Emerging adulthood is the 'in between age', which is unstable in nature and lasts from about 18-29 years. This is considered a period of transition and exploration, with a variable culmination from anywhere in the late 20s or the early 30s (Arnett, 2024). Emerging adults spend majority of their time on the internet and the pervasive nature of

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internet use in their everyday life makes them more susceptible to problematic internet use (Carone et al., 2023; Coyne et al., 2016). Being digital natives, use of the internet and various mobile apps is part of their daily life (Arnett, 2024). Therefore, considering the volume of exposure to different online platforms for various purposes, emerging adults are more susceptible to the possibility of becoming addicted to shopping via online food and instant delivery apps.

Food and instant delivery apps are a kind of online-to-offline (O2O) service that capitalizes an individual's constant access to digital devices and the Internet (Tandon, 2021; Kaur, 2021). Food and instant delivery apps provide customers with around the clock availability of a variety foods along with the convenience of quick doorstep delivery.

The relationship that humans have with food at present has drastically changed due to digital technology. This involves the way people think about food availability, food choices, and the manner and frequency of consumption (Keeble et al., 2022). We are now in a time in history where we can shop online with unmatched ease and seamless transaction. During this period, especially around the last 5 years this has also extended to online ordering of food and shopping for groceries through instant delivery apps (Ahuja et al., 2021; Selvan & Andrew, 2021). The previous level of convenience i.e. going to restaurants to eat or shopping at a supermarket or superstore is now competing with its online counterpart. People have constant access to personal devices that allow for the use of online shopping at a moments notice (Thamaraiselvan et al., 2019). Such around the clock availability and ease of access allows people to meet their needs instantly which creates the possibility of shopping on food and instant delivery apps becoming addictive in nature. Online shopping addiction has been defined as 'a tendency of excessive, compulsive and problematic shopping behavior via the internet that results in consequences associated with economic, social, and emotional problems'(Zhao et al., 2017). Shopping can become addictive in nature due to marketing strategies that create hyper-stimulating experiences, easy access and avialability, changes in one's dopamine reward system, and impaired self-regulation (Hartston, 2012; Alavi et al., 2012). Those addicted to shopping are unable to control their excessive behaviors even after facing negative consequences (Weinstein et al., 2016; Zhao et al., 2017).

Food delivery apps provide customers with unmatched convenience and variety but they also make high calorie unhealthy foods easily available for consumption (Willie et al., 2024). While online access has ensured around the clock availability of food, it also poses the challenge of unhealthy outcomes due to consumer choices. The short delivery times further incentivize the use of such apps, facilitating impulsive purchases and instant gratification of one's food cravings. These choices have unfavourable consequences in terms of poor nutritional and lifestyle choices, posing a risk to the health of individuals. Physical inactivity and poor dietary habits have been identified among primary health risk behaviors by the World Health Organization (WHO, 2014). Behavioral patterns that increase the risk for the development of physical and mental health problems can be termed health risk behaviors (Irish, 2011; Monni, 2022). Health risk behaviors increase the possibility of adverse health consequences, affecting health of an individual in the present as well as the future.

According to the World Health Organization (WHO), more than two-thirds of chronic diseases can be accounted for by health risk behaviours alone (WHO, 2014). Both unhealthy

diet and physical inactivity have been associated with obesity, which can contribute to a number of chronic diseases (Institute of Medicine Report on Health and Behavior, 2001; Cecchini et al., 2010). Various aspects of food delivery apps have been suggested to play a role in a sedentary lifestyle and obesity (Willie et al., 2024). While food delivery apps provide unparalleled variety and convenience they can have concerning consequences, especially with respect to public health. A significant concern is the abundance of high-calorie, low nutrition food on these apps (Fernandez & Raine, 2021).

Purpose of the Study

The online food delivery market has two delivery service solutions in the form of meal delivery and grocery delivery. Meal delivery comprises of prepared meals meant for direct consumption while grocery delivery includes non-prepared foods and beverages. India's online food delivery market is projected to reach US$43.78 billion in revenue in 2024 (Statista, 2024). While there is a huge demand and growing market opportunities for digital food ordering services, the question of how it impacts one's health is a relevant one.

While online access has ensured around the clock availability of food, it also poses the challenge of unhealthy outcomes due to consumer choices. There are few studies that have explored food delivery app use (Buettner et al., 2023; Dana et al., 2021; Osaili et al., 2023). Further there are not many studies that explore food delivery apps in a public health context (Stephens et al., 2020; Willie et al., 2024). Therefore, this study aims at exploring the patterns of food and instant delivery app use and the role of online shopping addiction for food and instant delivery apps in health risk behaviors such as unhealthy diet and physical inactivity.

An individual's weight and body mass index (BMI) depends on their food choices and their level of physical activity. According to the chronic disease prevention model developed by the Organisation for Economic Co-operation and Development (OECD) and WHO, diet and physical activity have an impact on one's body mass index which can contribute to proximal risk factors (like blood pressure and cholesterol levels) involved in various chronic diseases (Cecchini et al., 2010; Sassi et al., 2009). Calorie dense junk foods (like burgers, pizzas, fries) are the popular choice of foods ordered online with the frequency of eating food from outside being related to higher body mass index (Stephens et al., 2020). Hence, it is hypothesised that online shopping addiction for food and instant delivery apps will contribute to unhealthy diet which will impact physical activity of individuals.

A factor that distinguishes the emerging adults from other generational cohorts is their large amount of electronic media use (Arnett, 2024). The amount of time spent on media use, the unstable and exploratory nature of this age, along with the freedom they experience at this stage of life from parental supervision can lead to pathological media use, including problematic use of the internet (Arnett, 2024; Coyne et al., 2016). Emerging adult's excessive media and internet use presents the concern of their being more vulnerable to online shopping addiction through food and instant delivery apps. Further, it has been suggested that various social media platforms have an impact on the dietary behaviors and physical activity of young and emerging adults (Goerke et al., 2023; Ingersoll et al., 2022). Thus, this study explores the use of such apps among emerging adults and how it can impact their health.

METHOD

Participants

The sample consists of emerging adults between the ages of 18-29 years from Delhi/NCR with a total of 439 participants (224 males and 215 females).

Measures

- **Bergen Shopping Addiction Scale (BSAS)** developed by Andreassen et al. (2015). BSAS can be used in the context of both online and offline shopping. The scale has 7 items which were measured using a 5-point Likert scale, where 1= 'Completely disagree and 5= 'Completely agree' (Uzarska et al.,2021). The Cronbach's alpha for the scale was reported at 0.87 (Andreassen et al., 2015). The participants were asked to keep in mind their online shopping experience on various food and instant delivery applications while answering the questions as the present study was focused on people's shopping addiction through online food delivery applications.
- **Health Risk Behaviour Inventory (HRBI)** developed by Monni and Scalas (2022). The unhealthy diet subscale consisting of 5 items and the physical inactivity subscale consisting of 4 items was used. The items were rated on a 5-point Likert scale, where 1= 'Never True' and 5= 'Always True'. The McDonald's omega for unhealthy diet was 0.72 and for physical inactivity was 0.86 (Monni & Scalas, 2022).

Factors Associated with Food Delivery Applications

The participants were asked the following questions in order to understand how they use food delivery apps.

- "Which apps do yo use the most for ordering food, groceries, and snacks and drinks?" Responses were collected based on options ranging from 'Zomato', 'Swiggy', 'Uber Eats', 'Blinkit', 'Instamart', 'Zepto', and 'Others' (asked to mention).
- "What type of foods do you mostly order through food delivery and instant delivery apps?" Responses were collected based on options ranging from 'Junk/fast food (like burgers, pizza, fries, pasta, deserts etc.)', 'Healthy food (like salads, soups, high protein, low calorie etc.)', 'Snacks and drinks (like chips, biscuits, chocolates, juices, cold drinks, instant noodles etc.)', 'Groceries (like fruits, vegetables, rice, pulses, milk, eggs etc.)'
- "How frequently do you order food online?" Responses were collected based on options ranging from 'Once a day', '2-3 times a day', 'Once a week', '2-3 times a week', and 'More than 2-3 times a week'.
- "Which of the following factors contribute to your decision to order food online?" Responses were collected based on options ranging from 'Convenience of home delivery', 'Time saved', 'Effort saved', 'Offers/deals', and 'Membership discounts'.
- "What is your preferred mode of payment?" Responses were collected based on options ranging from 'Card', 'UPI', 'Net banking' and 'Cash on delivery'.

Socio-Demographic Factors

Scio-demographic information of the participants was also collected. This included information about age, gender, living arrangement and financial situation.

Procedure and Design

Data was collected using purposive sampling through an online questionnaire using Google forms. The sample had inclusion criteria for age between 18-29 years and Delhi/NCR for region. A total of 519 participants filled the questionnaire. From these 12 participants were removed as their responses indicated that they either do not order online or do not exclusively use food delivery apps. From the remaining data, a further 64 male respondents were removed (males from the last 100 respondents were removed) in order to have a nearly equal representation of males and females for the final analysis. This resulted in a sample of 443 participants (225 males and 218 females).

Keeping ethical considerations in mind, personally identifying information was not collected in order to maintain anonymity. Further consent of participation, right to withdraw and assurance of confidentiality was provided to the participants.

This study employs a quantitative methodology making use of the Pearson's chi-square test, Pearson's correlation and regression analysis to understand the relationship among the variables of interest.

RESULTS

Preliminary analysis of data was carried out to check for missing values, outliers and normality. There were no missing values. Four outliers were removed from the data based on the box plots obtained. After removing the outliers, a total sample of 439 participants remained (224 males and 215 females).

For normality check the test using kurtosis and skewness was carried out. The absolute skewness value was below 2 and the absolute kurtosis (excess) was below 4 for all the variables. When the sample size is greater than 300, an absolute skewness value ≤2 or an absolute kurtosis (excess) ≤4 can be used as an indicator of normality (Kim,2013; Mishra et al., 2019).

Descriptive Statistics

Table 1 Socio-demographic factors and delivery apps use patterns (n=439)

Age	n	%
18	36	8.2
19	59	13.4
20	73	16.6
21	72	16.4
22	56	12.8
23	21	4.8
24	23	5.2
25	28	6.4
26	26	5.9
27	23	5.2
28	11	2.5

29	11	2.5
Gender		
Female	215	49
Male	224	51
Apps used	**n**	**%**
Blinkit	116	26.4
BigBasket	8	1.8
Country Delight	1	0.2
DealShare	1	0.2
Flipkart	4	0.9
Instamart	44	10.0
Swiggy	268	61.0
Uber Eats	7	1.6
Zepto	54	12.3
Zomato	299	68.1
Types of food ordered		
Junk/fast food	326	74.3
Healthy food	46	10.5
Groceries	140	31.9
Snacks and drinks	231	52.6
Frequency of ordering		
Once a week	298	67.9
2-3 times a week	98	22.3
More than 2-3 times a week	24	5.5
Once a day	14	3.2
2-3 times a day	5	1.1
Living arrangement		
Living with family	155	35.3
Living alone	284	64.7
Financial situation		
Financially independent/earning	90	20.5
Financially dependent	349	79.5
Preferred mode of payment		
Card	12	2.7
Cash	133	30.3

UPI	283	64.5
Net banking	11	2.5
Factors contributing to app use		
Convenience of home delivery	358	81.5
Time saved	278	63.3
Effort saved	222	50.6
Offers/deals	168	38.3
Membership discounts	55	12.5

Inferential Statistics

Pearson's chi-square test was used to find the association between the variables. There was a significant association between the type of living arrangement $\chi^2 = 21.35$, $p < 0.001$ and type of financial situation $\chi^2 = 17.34$, $p < 0.01$ with the frequency of ordering through food and instant delivery apps. However, the association between gender $\chi^2 = 4.48$, $p = .345$ and preferred mode of payment $\chi^2 = 12.62$, $p = .397$ with the frequency of ordering was not significant.

Table 2 Chi-square results for relationship of various factors with the frequency of ordering through food and instant delivery apps

Frequency of ordering through food and instant delivery apps											
Characteristics	**Once a week**		**2-3 times a week**		**More than 2-3 times a week**		**Once a day**		**2-3 times a day**		
Gender	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**χ^2**
Female	147	68.4	44	20.5	15	7	8	3.7	1	0.5	4.48
Male	151	67.4	54	24.1	9	4	6	2.7	4	1.8	
Living arrangement											
Living with family	106	68.4	22	14.2	15	9.7	9	5.8	3	1.9	21.35**
Living alone	192	67.6	76	26.8	9	3.2	5	1.8	2	0.7	
Financial situation											
Financially independent	59	65.6	17	18.9	9	10.0	1	1.1	4	4.4	17.34**
Financially dependent	239	68.5	81	23.2	15	4.3	13	3.7	1	0.3	

Preferred mode of payment											
Card	11	91.7	0	0.0	0	0.0	1	8.3	0	0.0	
Cash on delivery	92	69.2	32	24.1	4	3.0	4	3.0	1	0.8	
UPI	190	67.1	61	21.6	19	6.7	9	3.2	4	1.4	12.62
Netbanking	5	45.5	5	45.5	1	9.1	0	0.0	0	0.0	

** indicates p < .01

Pearson's r was used to find the correlation between the variables. A positive correlation was found between online shopping addiction and unhealthy diet (r = .23, p < 0.01), online shopping addiction and physical inactivity (r = .04, p = .371) and unhealthy diet and physical inactivity (r = .28, p < 0.01).

Table 3 Means, standard deviations, and correlations of the variables of interest

Variable	**n**	**M**	**SD**	**1**	**2**	**3**
1.Online shopping addiction	439	17.81	6.40	—		
2. Unhealthy diet	439	14.17	3.18	.23**	—	
3. Physical inactivity	439	14.89	4.07	.04	.28**	—

** indicates p < .01

Results of regression analysis show that online shopping addiction explains 5.20% of the variance in unhealthy diet (R^2 = .052, F (1,437) = 24.15, p < .001). Further, online shopping addiction (β = .11, p< .001) significantly predicts unhealthy diet. Unhealthy diet explains 7.70% of the variance in physical inactivity (R^2 = .077, F (1,437) = 36.55, p < .001). Further, unhealthy diet (β = .36, p< .001) significantly predicts physical inactivity.

Table 4 Regression Coefficients of Online Shopping Addiction on Unhealthy Diet and of Unhealthy Diet on Physical Inactivity

Variable	**B**	**SE**	**t**	**p**	**95% CI**
Constant	12.15	.44	27.7	< .001	[11.28, 13.01]
Online shopping addiction	.11	.02	4.91	< .001	[.07, .16]
Constant	9.85	.85	11.54	< .001	[8.18, 11.53]
Unhealthy diet	.36	.06	6.05	< .001	[.24, .47]

CI= Confidence interval

DISCUSSION

The present study was designed to understand the patterns of food and instant delivery app use and to explore various socio-demographic factors associated with the frequency of ordering food and groceries online. The findings of the study indicated that majority of the participants ordered multiple types of foods/food items across multiple delivery apps. The most used food delivery apps were Zomato (68.1%) and Swiggy (61.0%). The most used instant delivery apps were Blinkit (26.4%) and Instamart (10.0%). The most ordered foods were junk/fast food (74.3%) followed by snacks and drinks (52.6%) and groceries (31.9%).

The highest frequency of ordering was once a week (67.9%) and 2-3 times a week (22.3%). Majority participants lived alone (64.7%), were financially dependent (79.5%) and preferred making payments through UPI (64.5%). Participants indicated multiple factors contributing to their app use with convenience of home delivery (81.5%), time saved (63.3%) and effort saved (50.6%) being among the top.

Previous studies have attempted to explore various socio-demographic factors that are related to online ordering of food and groceries with differing results (Buettner et al., 2023; Dana et al., 2021; Dominici et al., 2021; Tahim et al., 2024). Keeping in line with this, the association between gender, living arrangements, financial status, and preferred mode of payment with the frequency of ordering through food and instant delivery apps was also examined. A significant association was found between the type of living arrangement $\chi^2 = 21.35$, $p < 0.001$ and the frequency of ordering through food and instant delivery apps. Further, type of financial situation $\chi^2 = 17.34$, $p < 0.01$was also significantly associated with the frequency of ordering through food and instant delivery apps. However, the association between gender $\chi^2 = 4.48$, $p = .345$ and preferred mode of payment $\chi^2 = 12.62$, $p = .397$ with the frequency of ordering was not found to be significant.

The present study also examined the relationship and impact of online shopping addiction for ordering through food and instant delivery apps on unhealthy diet. The results showed a positive correlation between online shopping addiction and unhealthy diet ($r = .23$, $p < 0.01$). Further, online shopping addiction for ordering through food and instant delivery apps was found to be a significant predictor of unhealthy diet ($\beta = .11$, $p < .001$). This aligns with the fact that food delivery apps increase easy access and consumption of unhealthy foods (Buettner et al., 2023; Tahim et al., 2024; Willie et al., 2024).

Next, the relationship along with impact of unhealthy diet on physical activity was examined. Unhealthy diet was found to be positively correlated to physical inactivity ($r = .28$, $p < 0.01$). Further, unhealthy diet was found to significantly predict physical inactivity ($\beta = .36$, $p < .001$). This is supported by the fact that poor eating habits are associated with obesity, reduced physical activity and a sedentary lifestyle (Mesas et al., 2012; Muñoz-Pareja et al., 2013; Wagner et al., 2017).

Implications

The results of this study provide insights into the patterns of food and instant delivery app use along with their potential health risk in the young/emerging adult population. With the rapid expansion of internet access and smartphone usage in India, there has been a significant shift in consumer behavior. This is especially relevant amongst young/emerging adults who increasingly rely on digital platforms for their daily needs.

The study's novel approach to examining addiction to food delivery apps is significant as it addresses a potentially growing but under-researched phenomenon in the digital age. While much research has focused on digital addiction related to social media, online gaming, or general internet use, there has been relatively little exploration on shopping addiction through food delivery apps. The results of this study illustrate that higher levels of online shopping addiction for food delivery apps contributes to unhealthy diet and that such individuals tend to be less physically active. The convenience, variety, and ease of access offered by food delivery apps often can lead to frequent, compulsive ordering, making it challenging for users to control their habits. Unlike other digital platforms, food delivery

apps combine the instant gratification of online shopping with the immediate physical consumption of food, that can not only reinforce compulsive use but also contribute to poor health outcomes. Therefore, understanding the pattern of use and the addictive nature of food delivery apps is of importance as it can help highlight the nutritional and health choices of such individuals, and help offset negative consequences before they become a potential public health concern.

First, certain measures can be taken at the individual level itself. In order to deal with the potentially addictive nature of food delivery apps, individuals can be encouraged to identify factors such as lack of self-control, that may lead to the compulsive use of these apps. Further, individuals can develop certain self-management strategies that can help them keep their frequency of ordering in check so as to prevent the negative health and financial consequences of over ordering and excessive consumption.

Next, measures can be taken at the level of the apps themselves by incorporating changes within the apps. Incorporating self-management tools into the apps such as tracking food intake and setting limits on app usage can empower users to monitor and control their behaviors. Collaborations between app developers and health professionals could lead to features that guide users toward healthier options, such as offering incentives for ordering healthier meals or highlighting lower-calorie choices more prominently. This will not only benefit individuals but will also allow food delivery service providers to capitalize the health conscious market segment.

Finally, measures can be taken at the level of policymaking by implementing regulations that encourage food delivery services to offer more healthy options and require transparency in terms of nutritional information of the foods consumed. Public health campaigns that raise awareness about the risks of a sedentary lifestyle and promote physical activity are essential, particularly when targeted at young/emerging adults through social media and digital platforms.

Limitations & Future Directions

This study employed a quantitative methodology for its investigation. However, future research could benefit from qualitative, mixed-method, or longitudinal approaches to gain more insight into the food ordering and consumption habits of individuals, along with their nutritional and lifestyle choices. Additionally, this study focused on the health-related negative consequences of compulsive food delivery app use. Further research can examine other possible negative consequences such as social or financial, along with potential antecedents of compulsive food delivery app use. This study focused on the compulsive use of food and instant delivery apps. Researchers in the future should try delineate between food addiction and shopping addiction through food and instant delivery apps to see the differences and overlap between such individuals. Addressing these concerns will not only help individual consumers gain insights about their decision making with regards to food consumption but also help them make healthier lifestyle choices, enhancing the overall well-being of the population at large.

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Conflict of Interest

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