The Moderation Effects of COVID-19 Risk Perception in the Relationship between Food-related Lifestyle on the Consumption of Home Meal Replacements

Jinu Jung[1,] Seonglim Lee[1]

1 Department of Consumer Science, Convergence Program for Social Innovation, Sungkyunk-wan University, Seoul, South Korea

clothilda@skku.edu

Introduction

Recently, there has been increased interest in home meal replacements (HMRs) due to the rise in single-person households and changes in food-related lifestyles in South Korea. During the COVID-19 pandemic, consumption of HMRs has increased by 143% compared to pre-COVID times (KEI, 2020) due to restrictions on outings and prolonged stay-at-home periods. The consumption of HMRs has become an integral part of modern dietary life.

HMRs are meal solutions produced outside the home for domestic consumption (Costa et al., 2001). Generally, HMRs are categorized into three types (Harrison, 1979): Ready-to-Eat (RTE) products that can be consumed immediately without any additional cooking process; Ready-to-Heat (RTH) products that are pre-cooked by food manufacturers and can be consumed after heating procedures such as microwaving, typically found in frozen, vacuum-packed, or retort pouches; and Ready-to-Cook (RTC) products that are designed to be conveniently cooked and consumed by the consumer.

Numerous prior studies have investigated the relationship between food-related lifestyles and HMR consumption (Jang, Kim, & Yang, 2009; Jo, Lee, & Choe, 2014; Kim, Lee, & Lee, 2018). However, despite COVID-19 risk perception being one of the critical variables in predicting behavior during a pandemic, and the significantly different behaviors of groups perceiving the risk as low compared to those perceiving it as high (Qin et al., 2021), research examining the impact of COVID-19 risk perception on HMR consumption is scant. This study aims to examine how the relationship between food-related lifestyles and HMR consumption varies depending on the perception of COVID-19 risk.

Method

Research Questions

First, is there a significant difference in food-related lifestyles between groups with high and low COVID-19 risk perception? Second, do food-related lifestyles have a significant effect on HMR consumption? Third: do the effects of food-related lifestyles on HMR consumption vary depending on high and low COVID-19 risk perception?

Sample

We used data from the 2022 Consumer Behavior Survey for Foods conducted by the Korea Rural Economic Institute. The Consumer Behavior Survey for Foods has been conducted annually since 2013 to establish a representative and continuous survey system for food consumption behavior and to enhance a sustained and multifaceted understanding of food consumption in response to changes in food consumption behavior. A sample of 3321 households were used for the analysis. The demographic characteristics of the sample by the COVID-19 risk perception groups are presented in Table 1.

Table 1. Sample characteristics (N=3,321)

Variables		Low-RP (N=1,875) Freq(%)	High-RP (N=1,446) Freq(%)	χ^2
Gender	Male	98(5.23)	144(9.96)	27.056***
	Female	1,777(94.77)	1,302(90.04)	

Age	20s	50(2.67)	32(2.21)	
	30s	207(11.04)	140(9.68)	
	40s	410(27.87)	333(23.03)	28.927***
	50s	581(30.99)	491(33.96)	
	60s	425(22.67)	364(25.17)	
	70s	202(10.77)	86(5.95)	
Region	Capital	381(20.32)	405(28.01)	
	Metropolitan	627(33.44)	476(32.92)	30.181***
	Province	867(46.24)	565(39.07)	
Income(KRW)[1]	< 2 million KRW	353(18.83)	226(15.63)	
	2~2.99 million KRW	438(23.36)	253(17.50)	
	3~3.99 million KRW	358(19.09)	241(16.67)	61.517***
	4~4.99 million KRW	291(15.52)	219(15.15)	
	5~5.99 million KRW	233(12.43)	272(18.81)	
	≥ 6 million KRW	202(10.77)	235(16.25)	
Marital Status	Without spouse	509(27.15)	275(19.02)	29.912***
	With spouse	1,366(72.85)	1,171(80.98)	
Household Composition	Single-person households	604(32.21)	345(23.86)	27.918***
	Multi-person households	1,271(67.79)	1,101(76.14)	
Education	≤ Junior High School	332(17.17)	166(11.48)	
	High School Diploma	859(45.81)	723(50.00)	21.505***
	≥ Bachelor's Degree	694(37.01)	557(38.52)	
Employment	Employed	1,468(78.29)	1,084(74.97)	5.081*
	Unemployed	407(21.71)	362(25.03)	

Notes: 1) KRW 1 million = USD 758.15, Freq= Frequency

Measures

The dependent variable was the home meal replacement (HMR) consumption, which was measured by the average weekly purchase frequency of HMR products--Ready-to-Eat (RTE), Ready-to-Heat (RTH), and Ready-to-Cook (RTC). The independent variable, food-related lifestyle, was derived through factor analysis of 15 items that measured various aspects of food-related lifestyle. This analysis yielded four factors: Convenience, Hedonic, Rational, and Health. The moderating variable, the COVID-19 risk perception group, was categorized based on the median value obtained from the average of two items that measured concerns about COVID-19 infection when eating out. If the calculated value exceeded the median, the group was classified as High-Risk Perception (High-RP); whereas if it was below the median, the group was classified as Low-Risk Perception (Low-RP).

Table 2. Result of Exploratory Factor Analysis of the Food-related Lifestyle Scale

Construct	Item	Mean (STD)	FL	EV	CV
Convenience	I often use home meal replacements.	3.020 (0.776)	0.933	1.520	0.130
	I purchase individually packaged food products.		0.566		
	I eat simple meals such as bread or fruits.		0.551		
Hedonic	I desire a variety of tastes.	3.381 (0.603)	0.924	1.400	0.240
	I enjoy trying new foods.		0.541		
	I prioritize taste over price.		0.514		
Rational	I check the price-quality ratio when purchasing food.	3.296 (0.634)	0.698	1.300	0.350
	I make a grocery list before going food shopping.		0.554		

	I compare prices of the same product.		0.547		
Healthy	I refrain from consuming unsafe foods	3.756 (0.626)	0.657	1.150	0.450
	I try to avoid eating things that are unhealthy.		0.601		
	I tend to have regular meals.		0.492		

Notes: FL=Factor Loading, EV=Eigen value, CV=Cumulative variance

Analysis

This study conducted exploratory factor analysis applying Promax rotation on the measurement items of food-related lifestyles using the psych package and GPArotation package in R 4.2.0. To solve research questions, hierarchical regression analysis was conducted. The dependent variable was the weekly frequency of purchasing HMRs. The independent variable included food-related lifestyle factors and control variables in Model 1, and in Model 2 the Covid-19 risk perception was added to Model 1 as the independent variable. Model 3 was further built on Model 2 and included the interaction terms between food-related lifestyle factors and the Covid-19 perception group variable. These analyses were executed using STATA 17.0.

Results

As shown in Table 3, Convenience, Hedonic, and Rational food-related lifestyles were significantly associated with the weekly frequency of purchasing Home Meal Replacements (HMR), indicating that a higher Convenience lifestyle score and lower Hedonic and Rational lifestyle scores were related to a higher weekly frequency of purchasing HMR. Second, including the interaction terms between food-related lifestyle factors and the higher Covid-19 risk perception, the effects of interactions between Convenience, Hedonic, and Health-oriented food-related lifestyles and COVID-19 risk perception on the weekly frequency of purchasing HMR were significant indicating that the effects of Convenience, Hedonic, and Health-oriented food-related lifestyles on the weekly frequency of purchasing HMR were significantly different depending on COVID-19 risk perception. The influence of a Convenience-oriented food-related lifestyle on the weekly frequency of purchasing HMR was weaker among those with higher COVID-19 risk perception than those with lower COVID-19 risk perception. The negative influence of Hedonic-oriented food-related lifestyles disappeared among those with higher COVID-19 risk perception. Health-oriented food-related lifestyle was positively associated with a weekly frequency of purchasing HMR among those with higher COVID-19 risk perception.

Table 3. Result of hierarchical regression analysis of the weekly frequency of purchasing HMR.

	Model 1	Model 2	Model 3
Convenience	0.465***	0.482***	0.554***
	(0.038)	(0.038)	(0.049)
Hedonic	-0.147***	-0.140***	-0.234***
	(0.050)	(0.050)	(0.065)
Rational	-0.117***	-0.106**	-0.058
	(0.045)	(0.045)	(0.056)
Health	-0.024	-0.036	-0.102
	(0.042)	(0.042)	(0.053)
Higher-risk Perception (RP)		-0.154***	-0.732
		(0.052)	(0.409)
Convenience*RP			-0.183*
			(0.075)
Hedonic* RP			0.233*
			(0.100)
Rational* RP			-0.116
			(0.094)
Health* RP			0.197**

			(0.088)
N	3,321	3,321	3,321
R-squared	0.195	0.197	0.202

Notes: Standard errors in parentheses. Regressions control for a basic set of covariates, including gender dummy, age dummies, region dummies, income dummies, marital status dummy, household composition dummy, education dummies, employment dummy. *** p<0.001, ** p<0.01, * p<0.05

Conclusion

The findings from this study provide valuable insights into the impact of food-related lifestyles and COVID-19 risk perception on HMR consumption during the Covid-19 pandemic. Empirical evidence supports that the Convenience lifestyle significantly stimulates HMR consumption, highlighting the importance for businesses in this sector to emphasize the convenience of their products. Contrarily increases in Hedonic or Rational lifestyles have been associated with decreased HMR consumption, suggesting the need for a nuanced understanding and response to diverse lifestyle-based consumer segments within the HMR market. In addition to lifestyle influences, our analysis reveals that COVID-19 risk perception plays a pivotal role in HMR consumption. The results of the positive influence of hedonic- and health-orientated food-related lifestyles on HMR consumption among those with a higher COVID-19 risk perception indicate that during the COVID-19 pandemic, hedonic- and health-orientated food consumers with a higher COVID-19 risk perception tend to choose HMR instead of eating out during the COVID-19 pandemic. These results suggest that some HMR consumption temporarily increased during the COVID-19 pandemic and may decrease with the reduced risk perception of COVID-19.

References

Costa, A. I. D. A., Dekker, M., Beumer, R. R., Rombouts, F. M., & Jongen, W. M. (2001). A consumer-oriented classification system for home meal replacements. Food Quality and Preference, 12(4), 229-242.

Dratva, J., Zysset, A., Schlatter, N., von Wyl, A., Huber, M., & Volken, T. (2020). Swiss university students' risk perception and general anxiety during the COVID-19 pandemic. International journal of environmental research and public health, 17(20), 7433.

Harrison, A. F. (1979). Towards the systematic evaluation of convenience foods. HCIMA Journal, 94(10), 27-32.

Jang, Y. J., Kim, W. G., & Yang, I. S. (2009). Food-Related Lifestyle Segments and Mature Consumers' Attitudes to Home Meal Replacement.

Jo, H., Lee, S., & Choe, Y. (2014). Home Meal Replacement Market Segmentation: A Food-Related Life Style (No. 329-2016-12871).

Kim, E. E. K., Seo, K., & Choi, Y. (2022). Compensatory travel post COVID-19: Cognitive and emotional effects of risk perception. Journal of Travel Research, 61(8), 1895-1909.

Kim, S., Lee, K., & Lee, Y. (2018). Selection attributes of home meal replacement by food-related lifestyles of single-person households in South Korea. Food Quality and Preference, 66, 44-51.

Kim, Y. J., & Kang, S. W. (2021). Perceived crowding and risk perception according to leisure activity type during COVID-19 using spatial proximity. International journal of environmental research and public health, 18(2), 457.

Korea Environment Institute(KEI). (2020). Prospect and Strategies on Food Losses and Waste Generation by Dietary Patterns Change. Sejong: Korea Environment Institute. Available from: https://www.kei.re.kr/elibList.es?mid=a10103010000&elibName=researchreport&act=view&c_id=732899

Park, C. (2004). Efficient or enjoyable? Consumer values of eating-out and fast food restaurant consumption in Korea. International Journal of Hospitality Management, 23(1), 87-94.

Qin, H., Sanders, C., Prasetyo, Y., Syukron, M., & Prentice, E. (2021). Exploring the dynamic relationships between risk perception and behavior in response to the Coronavirus Disease 2019 (COVID-19) outbreak. Social Science & Medicine, 285, 114267.

Shamim, K., Ahmad, S., & Alam, M. A. (2021). COVID-19 health safety practices: Influence on grocery shopping behavior. Journal of Public Affairs, 21(4), e2624.