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The food safety behavior of Jordanian restaurant managers and supervisors: A social cognitive theory-based perspective

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A B S T R A C T

As foodborne diseases are current major health issues worldwide, food safety is a global health target. The present work has used social cognitive theory as theoretical support for examining the social and cognitive factors [outcome expectations (OE), self-regulation (SR), environmental determinants (ED), and self-efficacy (SE)] of Jordanian restaurant managers' and supervisors' food safety behavior (FSB). The moderator was willingness to comply (WC). Data were collected from the participants via Google Forms using purposive sampling methods. A total of 500 questionnaires were distributed, where 250 questionnaires were sent each to the Jordanian Restaurant Association (JRA, representing international and chain food restaurants in Jordan) as well as the Jordanian Union of Restaurants and Confectionary Proprietors (URCP, representing the local Jordanian restaurants). Two hundred and ninety-six completed questionnaires were returned. The hypotheses were analysed with smart partial least squares by structural equation modelling. The analysis determined that OE, SR, ED, and SE had positive impacts on FSB, while WC played a role in moderating the interlinkage among SE, OE, and FSB. To sum up, the current study as a whole also has significant theoretical and practical contributions for the practitioners in the given context.

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1. Introduction

Pathogen-contaminated food presents a severe threat to global public health as it can cause illness and diseases when consumed (WHO, 2023). Every year, contaminated food ingestion results in 600 million illnesses and 4.2 million deaths globally (WHO, 2022). Accordingly, food safety is among the serious concerns globally for the food industries, consumers, and regulatory authorities (Al-Shabib et al., 2017). Food contaminants enter the food system through a myriad of ways including improper food handling protocols, improper cooking, pathogen proliferation within food owing to poor storage conditions, contaminated food suppliers, inadequate personal hygiene, and cross-contamination (WHO, 2015). Notably, food contamination occurs due to food supply chain errors. For example, instant meals often result in foodborne illnesses (Soon et al., 2020). The challenging aspect of food safety stems from inadequate and ineffective food safety control protocols since consumers tend to buy food from traditional sources or compromise food quality over the value of goods. Consequently, these factors tend to result in foodborne illness (Osaili et al., 2022), which hinders socio-economic growth by potentially influencing the healthcare system, national economies, and tourism (Al Bayari et al., 2023). Foodborne illnesses persist despite prevention efforts, such as preventing food contamination and improving food storage and refrigeration (Shakeel et al., 2023). Foodborne illnesses might also occur when food service operators do not handle food appropriately (Boutros, 2018) by storing food at inappropriate temperatures and not maintaining hygiene while working (Al Bayari et al., 2023). Despite food handlers being widely blamed for unsafe food handling due to their front-line work positions (de Freitas & Stedefeldt, 2020), previous researchers only focused on food safety factors other than food handlers (Jespersen et al., 2019; Zanin et al., 2021), leadership,

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as well as adequate facilities (da Cunha, 2021).

Foodborne illnesses are increasing and can affect commerce, tourism, and public health, which involve the public, food service firms, and regulatory authorities (Taha et al., 2020). The Eastern Mediterranean areas have the third-highest prevalence of foodborne illnesses globally. As per the European Centre for Disease Prevention and Control (ECDC) as well as the European Food Safety Authority (EFSA), most foodborne illnesses (approximately 40%) tend to occur at home (EFSA & ECDC, 2019). Furthermore, foodborne illness incidence at home might be underestimated, as incidents might not be reported (Odeyemi et al., 2019). People in poor states, for instance, those living in the Middle Eastern regions, have a higher risk of catching foodborne diseases as compared to those from the developed nations owing to lacking proper monitoring and control protocols (WHO, 2022). Food safety issues require careful attention from food service establishment managers to minimise risks to consumer health, tourism, and the economy (Taha et al., 2020). Food service managers are accountable for ensuring that employees exercise safe food handling procedures to ensure that from contaminated food customers do not become ill. As per Arendt et al. (2013), managers are very important in establishing standards, strategy, expecting accountability, being role models, regulating practices related to rewards and penalties, and offering training and the essential resources needed to exercise food safety practices. Additionally, the individuals in managerial and supervisory positions are crucial in encouraging and inspiring employees for following proper food-handling practices. Nevertheless, restaurant managers do not have sufficient knowledge of food safety behavior (FSB) (Rebouças et al., 2017). Yet, kitchen managers with good food safety knowledge tend to be proactive when training food handlers (Kwol et al., 2020).

In the Middle Eastern and African Global Food Security Index, Jordan was rated 12th out of 15 nations, where its score was 54.2/100 (Global Food Security Index, 2019). Various food safety-related issues were reported in Jordan. For example, approximately 800 people experienced food poisoning from cheap restaurant meals (The Guardian, 2020), and various food products in Jordanian markets are contaminated with carcinogenic substances (Mauvais, 2021). While Jordan has passed several laws allied with food safety and established laboratories, this matter still remains doubtful, calling for an enhanced epidemiological surveillance system (Osaili et al., 2022). To preserve Jordanian quality and safety of food safety, Jordan Food Law No. 30 (2015) grants the Jordan Food and Drug Administration (JFDA) authority regarding all food safety issues in Jordan. While the JFDA attempts to ensure restaurant food safety, its annual report stated that food establishments persistently breach food laws and thus are compelled to cease operations (JFDA, 2015; JFDA, 2021). The FSB can be explained by several theories. For instance, the theory of reasoned action (TRA) as well as theory of planned behavior (TBP) are both widely used behavioral prediction theories (Dwivedi et al., 2019). Both theories share identical attitudinal and social norms constructs to explain behaviors (Alhamad & Donyai, 2021). Nonetheless, the two theories do not sufficiently capture behavioral variability, as they focus extensively on intentions (Sniehotta et al., 2014). In addition to the limitations of the aforementioned theories, the factors that contribute to FSBs should be identified (Osaili et al., 2022). Given the psychological, social, and behavioral components of food safety research, this study proposed and investigated social cognitive theory (SCT) constructs to determine the essential factors associated with food safety outcomes. The SCT aims to understand the ways by which people modify their health routines, and the public and environmental factors that impact behavioral variation (McAlister et al., 2008).

This research contributes to food safety as it examines the factors that contribute to Jordanian restaurant managers' and supervisors' FSB. Contrastingly, previous studies mainly focused on FSB in hotels (Okumus, 2020; Sönmez et al., 2020). Furthermore, the findings are a unique contribution as the study examined restaurant managers' and supervisors' FSB as compared to previous reports on FSB knowledge, attitude, and practices (Al-Kandari et al., 2019; Kwol et al., 2020; Odeyemi et al., 2019). This research is suitable for addressing the frequent food safety violations of small Jordanian restaurants, which harm their reputation and the economy despite government efforts to the contrary. The findings contribute significantly to the literature on restaurant managers' roles in ensuring FSB. Additionally, the results could help agencies of government inspection in establishing innovative and fresh policies develop strategic plans to safeguard food safety and public health concerns and in conducting precautionary and policymaking actions for complying with the standards of JFDA and the Jordanian food laws (Food Law No. 30 (2015)). Thus, identifying the factors that influence restaurant managers' and supervisors' FSB will aid Jordan in becoming a regional food safety centre.

2. Theoretical Framework

The SCTs can potentially identify the determinants of preventive behaviors by facilitating the identification of the behavior-related factors. Furthermore, SCTs aid the design of appropriate interventions to increase adherence to preventive health-related behaviors (Hagger et al., 2020; De Andrade et al., 2020). Accordingly, this study was based on SCT, which consists of environmental, personality, and behavioral factors. These three factors are reciprocally related and potentially explain human behaviors. The SCTs are widely used to predict individuals' health-related behaviors (Font et al., 2016) alongside dietary behaviors (Lee et al., 2016). Individuals' food-related preparation, goal-setting, and self-assessment (Boutros & Roberts, 2020) tend to influence FSB. Accordingly, the study suggests that self-efficacy (SE) refers to the belief in an action (Bandura, 1994), outcome expectations (OE), environmental determinants (ED), and self-regulation (SR). Figure 1 depicts the theoretical framework proposed for the current work.

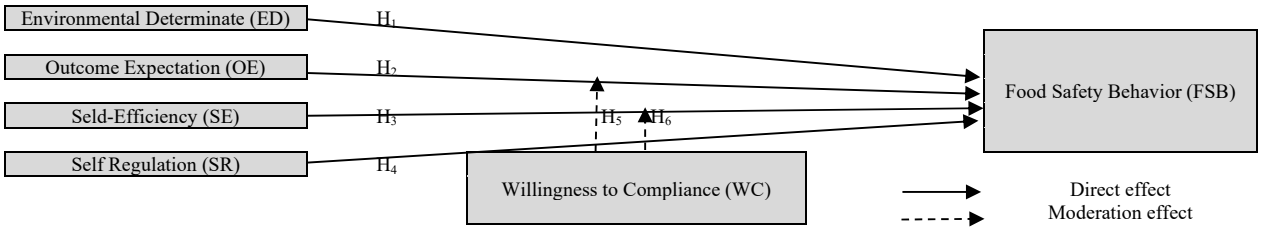

Fig. 1. Theoretical Framework

2.1. The ED

The environment is among the primary factors in the determination of human behavior in SCT (Bandura, 1994), given that behavioral change is associated with physical and social environmental changes (Bandura, 2002). Similarly, food is an ED connected to FSB (Arias, 2015) since it has potential implications for human health and in turn, environmental sustainability (Clark et al., 2019). There exist numerous environmental aspects and determinants that are closely allied with and influence food safety like air, soil, chemical usage in the agricultural sector, contamination with sewage of farm/urban, aquatic pollution due to industrial waste/emissions, and so forth (Pahlen, 2008). Accordingly, EDs are external and internal factors that influence FSB (Boutros, 2018). The ED is a positive predictor of FSB adoption intention (Boutros, 2018; Liguori et al., 2018). Environmental attributes, such as resources, structures, or physical conditions tend to facilitate behavioral execution (Boutros & Roberts, 2020). This study suggested that restaurant managers and supervisors engage in FSB more easily when they work in an environment that facilitates food safety inspection. Accordingly, the following hypothesis was proposed:

H_1: *ED are positively related to FSB.*

2.2. The OE

The OE is believed to be essential to human psychological functions. Generally, OE denotes the views regarding the predictable results of performing a behavior (Bandura, 1986). For example, Bandura (1999) suggested that people might change their activities based on their expected outcomes. Therefore, actions are more likely to be composed and implemented with positive outcomes. In contrast, in behaviors that yield undesirable results, people are more willing to relinquish them. Mucinhato et al. (2022) reportedly noted positive impacts of expected outcomes upon preventive behaviors. Regarding food safety, OE alludes to the anticipated optimistic as well as potential adverse outcomes of FSB (Boutros, 2018). The expected outcomes concerning FSB tend to be positive. This study suggested that OE might increase regarding FSB, particularly when people are highly concerned about the issues associated with tainted food or are aware of foodborne illness. The study suggested that positive expectations regarding the outcomes of performing FSB would increase restaurant managers' FSB. Accordingly, it was hypothesised that:

H_2: *The OE is positively related to FSB.*

2.3. The SE

The SE alludes to the individual's belief that they are capable of performing certain tasks or behaviors (Zhang et al., 2021). The SE is expected to positively influence protection motivation and behavioral intentions regarding restaurant selection for safe food (Choi et al., 2019). Similarly, restaurant managers' and supervisors' higher belief that they can ensure food safety can also foster FSB. The SE is one of the important predictors of FSB among adolescents and accounts for approximately 42% of behavior change. Individuals' beliefs concerning FSB tend to influence their compliance with such practices (Beavers et al., 2015). Boutros and Roberts's (2020) recent study of Chinese and Mexican restaurants determined that SE positively predicted FSB. Accordingly, this study suggested that restaurant managers' and supervisors' self-belief regarding FSB would increase their behavior toward preventing food wastage and result in increased FSB. Therefore, it was hypothesized that:

H_3: *The SE is positively related to FSB.*

2.4. The SR

The SR denotes an individual's control of themselves via goal setting, self-monitoring, and information processing to accomplish a goal (Bandura, 1991). The SR also denotes the individual's plan regarding how the behavior is to be maintained and includes behavioral implementation barriers (Chidziwisano et al., 2020). The SR is an important predictor of FSB (Fulham & Mullan, 2011). Similarly, a study of Chinese and Mexican restaurants indicated that SR tended to influence FSB (Boutros & Roberts, 2020). When a restaurant manager aims to ensure FSB, it is possible that they might accomplish it by implementing specific measures, such as training food handlers. This study suggested that restaurant managers' and supervisors' SR tends

to guide their preservation of FSB and their identification of solutions to resolve issues. Accordingly, it was hypothesised that:

H_4: *The SR is positively related to FSB*.

2.5. The Moderating Role of Willingness to Comply (WC)

Compliance denotes adherence to the respective laws, rules, norms, and standards of regulatory agencies, industry associations, and self-regulatory organizations (El Kharbili et al., 2022). In food safety, compliance involves restaurant adherence to food safety standards to protect the public from unsafe or illegal behavior (McNeil, 2019). As food handlers handle, serve, prepare and store food, their compliance with regulations of food safety is crucial as it may assist in alleviating the risky aspects of foodborne illnesses (Taha et al., 2020). Increasingly challenging food sectors require risk management to meet regulatory standards (Sharpe, 2017). Inadequately trained workers, inferior goods, and food safety standards non-compliance can be detrimental to fast-food restaurant reputations and cause financial losses (McNeil, 2019). Fast-food restaurants experience economic loss owing to not adhering to food safety regulations and protocols (Calcador, 2017). The main shortages in the monitoring and preparation stages of food involve non-adherence to sound food handling approaches, non-compliance with standard operating procedures, and unable to sustain the sanitary standards for restaurants and equipment (Campbell et al., 2015). Furthermore, compliance with food hygiene and safety behaviors is based not only on job requirements but also on the belief in maintaining consumers' health (Ko & Kang, 2019). The manager's and supervisor's role in compliance cannot be overlooked, where food managers should ensure that all procedures meet standards (Taha et al., 2020). Restaurant managers' and supervisors' prime responsibility is to ensure compliance as the best approach to end unsafe food practices. Accordingly, the study suggested that restaurant managers' and supervisors' WC is an external factor that enhances the relationship between the predictors (OE and SE) and FSB. Boutros (2018) reported the substantial influence of OE on FSB. Conversely, SE favorably increased coronavirus disease 2019 (COVID-19) transmission prevention behavior (Ramdan et al., 2022). Previous studies (Boutros, 2018; Boutros & Roberts, 2020) reported the low impact of both SE and OE on self-reported FSB, which indicated that an external variable might influence the relationship between OE, SE and FSB. Thus, the present study considered the moderating role of WC as a moderator. Accordingly, this study stated that the WC with food safety tends to enhance the relationship between restaurant managers' and supervisors' OE, SE, and FSBs. Accordingly, it was hypothesized that:

H_5: *A high WC strengthens the positive relationship between OE and FSB*.

H_6: *A high WC strengthens the positive relationship between SE and FSB.*

3. Methodology

3.1. Population and Sample Size

The current study examined the FSB at Jordanian restaurants. The study population consisted of 1876 Jordanian restaurants categorized as small and medium enterprises (SMEs, < 20 employees) by the Amman Chamber of Industry. A purposive sampling method was used. The JFDA guidelines and standards (2020) require a restaurant to have a manager and at least two supervisors, which renders such staff suitable as study respondents. Furthermore, restaurant managers and supervisors were selected as the study sample as they could also share their knowledge about food handling practices with lower-level staff and train them. In accordance with Hair et al. (2019), it is imperative to determine the sample size in consonance with the statistical power of the analysis, denoting the minimal requisite number of observations relative to the complexity of the model under consideration. Within the context of our research model, the highest predictor was 7, signifying the continuation of voluntourism. Drawing upon the recommendation posited by Gefen et al. (2011), it is advisable to adopt a power level of 0.8 to detect a medium effect size within the study. Following the prescriptive guidelines elucidated in Green's (1991) seminal work and taking into account the 7 predictors embedded within the research framework alongside the medium effect size criteria as advocated by Gefen et al. (2011), the minimal requisite sample size should encompass 101 respondents. Given that the study was conducted with a cohort of 296 participants, it is affirmed that the sample size was satisfactory enough to rigorously assess the hypotheses postulated within the ambit of our research framework.

3.2. Questionnaire and Pre-Testing

The questionnaire used in this study contained questions related to both the study demographics and variables (OE, SE, SR, ED, WC, and FSB). All questions for the variables were adapted from previous studies, where SE, SR, ED, FSB, OE, and WC were measured by a three-item measure, an eight-item measure (Boutros, 2018), a 10-item measure (Boutros, 2018), a five-item measure (Taha et al., 2020), a four-item measure, and a six-item measure (Bodas & Peleg, 2020), respectively. Anticipating common method variance due to the single source, the dependent variable was ranked using a seven-point Likert scale, while the independent variable and moderator were ranked using a five-point scale (Podsakoff et al., 2012; Ngah et al., 2021b). All scales were adjusted based on the measurements used in the previous measurement. Pre-testing was used to avoid

sub-standard data quality and reduce or prevent item removal during measurement model evaluation (Memon et al., 2021). The questionnaire was not significantly changed with respect to the study context.

3.3. Data Collection and Respondents' Profiles

Since the unavailability of the sampling frame, the non-probability technique was adopted for the collection of data for the research (Tongco, 2007), and to select the respondents that may aid the obtainment of accurate and relevant information, the purposive sampling technique was used (Campbell et al., 2020). The managers and supervisors were suitable as respondents because they could share knowledge with food handlers and train employees and were aware of JFDA laws and requirements. A total of 500 questionnaires were emailed from the Amman Chamber of Industry, where 250 questionnaires each were sent to the Jordanian Restaurant Association (JRA, representing the authority of international and food chain restaurants in Jordan) as well as the Jordanian Union of Restaurants and Confectionary Proprietors (URCP, representing local Jordanian restaurants).

This study used filter questions like those used by Ngah et al. (2021a) to ascertain respondent validity. The respondents were restaurant supervisors and managers. All responses from non-managerial staff were excluded automatically by the Google Forms system. The participants were also asked to disseminate the questionnaire link across their colleagues with the same criterion for obtaining valid responses. Data collection was done between March and May in the year 2022 using Google Forms, which is fast, easy, and consistent (Regmi et al., 2016). A total of 302 completed questionnaires were returned (URCP: 132; JRA: 170). Six responses were excluded due to erroneous answers. Hence, the usable number of responses was 296 (58% response rate). Table 1 recapitulates the demographic characteristics of the sampled participants.

Table 1
Demographic Details of the Respondents

Group	Frequency	Percentage
Gender		
Female	114	38.5
Male	182	61.5
Qualification		
Diploma	49	16.6
Bachelor	64	21.6
Master	109	36.8
PhD	74	25.0
Experience		
<5 years	20	6.8
5-10 years	36	12.2
10-15 years	130	43.9
15 years and more	110	37.2
Position		
Supervisor	139	47.0
Manager	157	53.0

4. Results and Analysis

The hypotheses were tested using PLS-SEM since is widely used for theory testing instead of theory development (Hair et al., 2021). Based on Hair et al. (2019), Ngah et al. (2019), and Ngah et al. (2021c), the data was not normally distributed and was multivariate, with Mardia's multivariate kurtosis ($b = 83.96$, $p < 0.01$) as well as Mardia's multivariate skewness ($b = 17.67$, $p < 0.01$).

4.1. Common Method Bias (CMB)

Since CMB might arise due to the data collection from a single source, thus, the issues associated with CMB were resolved with procedural and statistical procedures (Halimi et al., 2022). The unobserved marker variable approach was employed for the statistical testing (Podsakoff et al., 2012). the model with the marker variable maintained all significant effects present in the model without the unmeasured marker variables, thus suggesting that no strong evidence of CMB for the study.

4.2. Measurement Model

The correlations between items and constructs were tested using measurement model assessment. For computing the first-order constructs, the average variance extracted (AVE), factor loadings, and composite reliability (CR) were considered. For each matrix, both indicators surpassed the assessment standards, where the CR was 0.7 and the AVE was 0.5. Additionally, factor loadings for the items were > 0.5. Therefore, no issue was detected (Hair et al., 2014). The consistency of distinct conceptions was evaluated with convergent validity. All three-performance metrics (see Table 2) lay within the suitable ranges proposed by Hair et al. (2014). The findings suggested that all indicators (CR, AVE, and factor loadings) were within their acceptable range. Thus, convergent validity was established.

Table 2
Convergent Validity

CONSTRUCT	ITEM	LOADING	CR	AVE
Environmental Determinants	ED1	0.846	0.967	0.788
	ED2	0.906		
	ED3	0.898		
	ED4	0.913		
	ED5	0.900		
	ED6	0.896		
	ED7	0.858		
	ED8	0.884		
Food Safety Behavior	FSB1	0.923	0.965	0.848
	FSB2	0.902		
	FSB3	0.936		
	FSB4	0.919		
	FSB5	0.923		
Outcome Expectation	OE1	0.913	0.951	0.828
	OE2	0.914		
	OE3	0.909		
	OE4	0.906		
	SE1	0.907	0.941	0.843
	SE2	0.931		
	SE3	0.917		
Self-Regulation	SR1	0.896	0.965	0.821
	SR2	0.895		
	SR3	0.905		
	SR4	0.907		
	SR5	0.914		
	SR6	0.919		
Willingness to Comply	WC1	0.911	0.967	0.828
	WC2	0.916		
	WC3	0.911		
	WC4	0.898		
	WC5	0.924		
	WC6	0.900		
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	ED2	0.906		
	ED3	0.898		
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	SE2	0.931		
	SE3	0.917		
Self-Regulation	SR1	0.896	0.965	0.821
	SR2	0.895		
	SR3	0.905		
	SR4	0.907		
	SR5	0.914		
	SR6	0.919		
Willingness to Comply	WC1	0.911	0.967	0.828
	WC2	0.916		
	WC3	0.911		
	WC4	0.898		
	WC5	0.924		
	WC6	0.9		

Note: CR = composite reliability; AVE = average variance extracted
ED9, ED19, and SR7 were deleted due to low loadings.

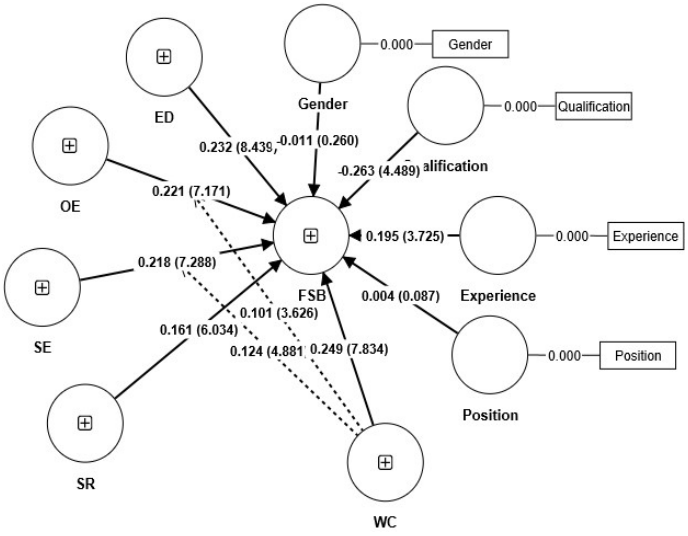

Fig. 2. Structural Model Assessment

Discriminant validity measures the magnitude to which one construct differs from another. All study constructs met this criterion, which demonstrated that the item construct variances were higher than those of other constructs. Discriminant validity was assessed with the Heterotrait-Monotrait correlation ratio (HTMT) (Henseler et al., 2015). An HTMT > 0.85 suggests difficulty in determining discrimination. Table 3 demonstrates that all HTMT for each construct were < 0.85. Thus, in this study, discriminant validity was not a significant concern.

Table 3
Discriminant Validity (HTMT)

	ED	FSB	OE	SE	SR	WC
ED						
FSB	0.796					
OE	0.631	0.759				
SE	0.656	0.805	0.655			
SR	0.504	0.686	0.543	0.596		
WC	0.315	0.46	0.207	0.221	0.189	

4.3. Structural Model

Collinearity must be eliminated before the structural model is tested. Collinearity is present when variance inflation factor (VIF) values are > 3.3 (Diamantopoulos & Siguaw, 2006). The VIF values were < 3.3 (see Table 4), which indicated no predictor collinearity. In accordance with Hahn and Ang (2017), p-values are not solely suitable criteria for hypothesis testing. Thus, they suggested combining confidence intervals and effect sizes alongside p-values to determine better outcomes. Table 4 depicts the hypotheses testing criteria. According to Hair et al. (2019), a total of 5000 resampling techniques were used, the beta value (the beta value direction must align with the hypothesis direction), the t-value (≥ 1.645), the p-value (0.05), and the bootstrapping confidence interval [no zero value between the lower level (LL) and upper level (UL) to prove that the hypothesis is supported]. Table 4 depicts the direct and indirect effects of the hypotheses.

The ED positively influenced FSB (β = 0.249, t = 8.897, p = 0.001), indicating that H1 is supported (see Table 4). Similarly, OE (β = 0.235, t = 7.322, p = 0.001) and SE (β = 0.273, t = 7.884, p = 0.001) positively influenced FSB. Hence, H2 and H3 were statistically supported. The SR also positively influenced FSB (β = 0.182, t = 6.592, p = 0.001), and thus H4 was supported.

In addition to the direct relationship between the variables, WC was also tested as a moderator. The WC positively moderated the relationship between OE and FSB (β = 0.125, t = 4.542, p = 0.001) (see Table 4). The results that supported H5 affirmed that OE tended to have a strengthened influence on FSB in the presence of WC. Similarly, WC positively moderated the relationship between SE and FSB (β = 0.151, t = 5.761, p = 0.001). Thus, H6 was supported. Fig. 3 and Fig. 4 depict the histogram plots for both moderating relationships.

The coefficient of determination (R^2) for the study was 0.872, which indicated that the explained variance in the dependent variable was 87.2%. Table 4 lists the f^2 values, which denote the effect size of the variables. Cohen's (1988) guidelines state that 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, respectively. Predictors are more essential when the

f^2 value is larger. Only SR had a small effect size on FSB as compared to the other variables (ED, OE, and SE), which had a medium effect size (see Table 4). Thus, all variables except SR contributed significantly towards FSB. Specifically, ED (f^2 = 0.226) contributed the most towards FSB, whereas SR (f^2 = 0.133) contributed the least.

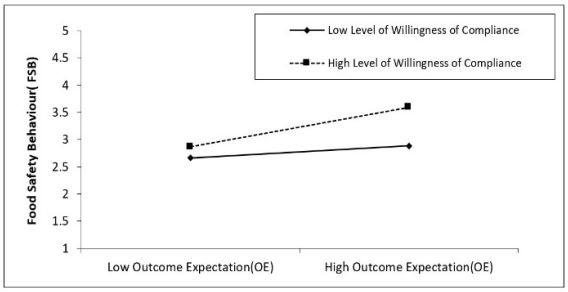

Fig. 3. The positive relationship between OE and FSB will be stronger when WC is high

Fig. 4. The positive relationship between SE and FSB will be stronger when the WC is high

4.4. Control Variables

This study tested the relationship between the variables and also tested the control variables (gender, qualification, experience, and position). Overall, the control variables accounted for 88.4% of the variance in the dependent construct collectively. Nevertheless, the control variables accounted for only -1.2% of the variance in the dependent construct. Therefore, the independent factors accounted for 87.2% of the variance. Besides, the dependent variable was significantly influenced by no control variable, which confirmed that the control variables did not affect the connections that were examined. Mansor et al. (2022) stated that control factors are not always important in adoption studies at the level of individual units of analysis.

Table 4
Hypotheses Testing

Hyp	Relationship	Beta	SE	T-Value	P Values	LL	UL	f^2	Effect Size	VIF
H_1	ED → FSB	0.249	0.028	8.897	0.001	0.203	0.298	0.226	Medium	2.007
H_2	OE → FSB	0.235	0.032	7.322	0.001	0.181	0.286	0.193	Medium	2.375
H_3	SE → FSB	0.273	0.035	7.884	0.001	0.218	0.331	0.182	Medium	2.599
H_4	SR → FSB	0.182	0.028	6.592	0.001	0.136	0.226	0.133	Small	1.591
H_5	OE*WC → FSB	0.125	0.027	4.542	0.001	0.079	0.171	-		1.877
H_6	SE*WC → FSB	0.151	0.026	5.761	0.001	0.11	0.194	-		1.761
-	Gender → FSB	-0.011	0.041	0.26	0.397	-0.08	-	-	-	-
-	Qualification → FSB	-0.263	0.058	4.489	0.001	-0.36	-	-	-	-
-	Experience → FSB	0.195	0.052	3.725	0.001	0.111	-	-	-	-
-	Position → FSB	0.004	0.042	0.087	0.465	-0.066	-	-	-	-

Note: Hyp = Hypothesis; LL = lower level; UL = upper level; f^2 = effect size; VIF = variance-inflated factor

4.5. PLS Prediction

Due to the blindfolding procedure limitations, measurement errors were predicted with PLS as proposed by Shmueli et al. (2019) to test the predictive relevance. Hence, PLS root mean square error (RMSE) and linear modelling (LM) RMSE were compared. The PLS and LM differences < 0 indicate that the model has strong predictive power. Conversely, the predictive power is considered moderate if most of the differences are < 0. Values < 0 indicated poor predictive power. All items for all exogenous variables were lower than the LM values, indicating the model's high predictive potential. Table 5 depicts the PLS prediction analysis results.

Table 5
PLS Prediction

ITEMS OF DV	PLS-RMSE	LM-RMSE	PLS-LM	Q^2_predict
FSB1	0.909	1.029	-0.12	0.761
FSB2	0.953	1.098	-0.145	0.686
FSB3	0.895	1.036	-0.141	0.761
FSB4	0.922	1.067	-0.145	0.728
FSB5	0.959	1.021	-0.062	0.735

5. Discussion

This study examined the factors affecting FSB at small Jordanian restaurants. The relationship between SCT variables (ED, OE, SR, and SE) and FSB was investigated. Additionally, WC was tested as a moderator of the relationships between FSB, OE, and SE. Furthermore, the effect of WC on food safety practices in Jordan was evaluated for the first time. The results demonstrated that small Jordanian restaurants complied with all SCT constructs, which positively affected their FSB.

This study predicted health behaviors using SCT. The hypothesis testing determined that ED positively affected FSB and thus supported H1. A previous study reported similar findings and stated that FSB was affected by the surroundings (Boutros, 2018). Hence, restaurants should have the required tools and resources for handling food safely, whereas York et al. (2009) reported that inadequate equipment and infrastructure might restrict food service workers from achieving food safety. Managers might inspire their workers to follow safe food handling procedures, for example, by verbally praising workers and using positive reinforcement (Fulham & Mullan, 2011).

The H2 was supported, which confirmed that FSB might be predicted based on the expected outcomes. This result paralleled that of Wen and Kwon (2017), who reported that servers' risk communication and risk perception behaviors in serving customers with food allergies were affected by their perception of the allergic reaction severity. In a related study, Roseman and Kurzynske (2006) reported that workers' expectations of the potential aftereffects of poor food handling behaviors on their target consumers as well as the repute of their business might encourage their intentions to display proper FSB. Additionally, Roberts et al. (2008) proposed using persuasive language to change employee behavior, such as by informing food handlers of the consequences of failing to follow food safety standards.

The results demonstrated a positive relationship between SE and FSB and thus supported H3. This result aligned with Young et al. (2018), who concluded that those who are self-assured in their ability to execute safe food handling are more likely to do so. A person's willingness to engage in a behavior is influenced by their confidence in their capacity to maintain good health, their belief in their ability to overcome challenges, and their overall sense of SE (Boutros, 2018; Boutros & Roberts, 2020).

The results supported H4, which proposed a positive link between SR and FSB. The findings indicated that food handlers were more inclined towards having a sustained willingness to execute the right actions and reported monitoring their food safety protocols, setting goals, and assessing their performance. Food handlers with more SR have greater capability to regulate their behavior, specifically in a supportive environment (Fulham & Mullan, 2011). Therefore, SR might motivate food handlers to practice safe food-handling habits (Boutros & Roberts, 2020).

The H5 test results suggested that a high WC might enhance OE, and consequently FSB. This result demonstrated that respondents believed that avoiding liability would be the most significant benefit of following proper food handling procedures, which would result in reduced risk of foodborne illnesses, lawsuit prevention, and good reputation preservation. Consequently, enlightening food handlers about the negative effects of bad habits can change their feelings about food safety (Boutros, 2018). As per SCT, a person's expectancy of the way they would feel about themselves in case they do or do not perform an action may influence that behavior (Boutros, 2018; Boutros & Roberts, 2020; McAlister et al., 2008). Consequently, educating the food handlers regarding the optimistic aspects of practising FSB has the potential to stimulate their adherence to appropriate food safety protocols so as to protect themselves and their businesses against liability. The WC was an internal personality factor that strengthened the relationship between OE and FSB and was also consistent with SCT, which suggested that personality influences the behaviors. As H5 was supported, it suggested that WC strengthened the positive relationship between OE and FSB.

The SE affects compliance with prevention behaviors, such as hand washing and safe food handling. Hence, increasing a person's SE levels might increase their ability to improve safe food handling practices. The SE was linked to several food health behaviors and might be increased by defining action plans, procedures, and specific objectives and being responsible for meeting them (Boutros, 2018; Boutros & Roberts, 2020; McNeil, 2019). Notably, WC included the restaurants that followed standards to ensure food safety aimed at protecting the public from unsafe food (McNeil, 2019). The results revealed that a strong WC with food safety standards strengthened the self-belief to perform FSB. Ultimately, this belief resulted in increased FSB at small Jordanian restaurants. The H6 test results demonstrated that WC might enhance SE and consequently FSB. The H6 was supported, which suggested that WC strengthened the positive relationship between SE and FSB.

As an individual-related external factor, as a moderator, WC was used to increase the SCT predictive power. The SCT states that the individual's personality, behaviors, and environment actively shape their responses (Bandura, 1986). Accordingly, the study strengthened the predictive power by including the individual approach as a boundary condition. The outcomes demonstrated that WC might strengthen the positive relationship between SE and OE with FSB. Food handlers with a positive perception of their competence and who perceive fewer barriers would have an increased likelihood of complying with food safety rules (De Oliveira et al., 2016).

For Jordanian restaurants, appropriate strategies should be used to improve compliance with rules and regulations and increase customer confidence. Yazdanpanah et al. (2015) indicated that the intention to engage in FSB might increase compliance, specifically with positive SE, SR, OE, and ED. Employees should be reminded and provided with sufficient resources and be motivated to perform the correct food-handling behaviors (Fulham & Mullan, 2011), which would motivate their SR and hence enhance their compliance.

A technology acceptance study reported that the user's willingness is a key factor that drives their actual behavior (Yuan et

al., 2022). Notably, employees are strongly committed to the organisation and feel emotionally attached to it, which results in goal accomplishment (Bakker et al., 2012). Another study stated that in food safety, employees' dedication rather than money is required to reduce compromised food (Al Bayari et al., 2023). Accordingly, the results revealed that the restaurant managers' higher self-belief influenced their FSB, but their higher willingness to meet food safety rules and regulations ultimately enhanced their FSB.

6. Study Contributions

6.1. Theoretical Contributions

This study provided a valued contribution to the restaurant FSB literature and enhanced understanding of restaurant managers' FSB. Hotel managers' or food handlers' FSB were predominant in the previous literature (Okumus, 2020; Sönmez et al., 2020). Furthermore, the findings enhanced understanding of the factors that lead to restaurant managers' and supervisors' FSB in a non-developed country, namely Jordan. Contrastingly, developed countries predominated in the previous literature. The current research made a valued contribution to the body of literature on Middle Eastern countries and will add to the emerging literature on Middle East tourism and hospitality. The study is significant as it enhanced an understanding of the social cognitive frameworks that influence restaurant managers' and supervisors' attitudes toward FSB. The findings will aid food safety instructors and trainees in addressing psychological and environmental factors. Furthermore, instructors and trainers will benefit from the predictability of SCT components in Jordanian restaurants. The study described SCT food safety guidelines for Jordanian restaurant owners, who should feature the following aspects at work: SE, OE, ED, SR, and more importantly, WC to FSB. Additionally, the findings highlighted the fact that restaurant managers and supervisors should create an expected outcome for performing FSB. Moreover, they can enhance SE by training employees to practice FSB, which would increase food safety awareness. The study contributed significantly to the SCT literature and with FSB with a boundary condition. By testing WC as a moderator, this study contributed to the literature on how the relationship between SCT and FSB can be strengthened in the presence of a moderator or boundary condition. For example, restaurant staff who are aware of FSB issues and have the knowledge to take appropriate measures will perform FSB based on personal willingness. Accordingly, the findings were the most recent and valuable theoretical insights into how WC strengthens the influence of both SE, OE, and FSB. The results improved theoretical understanding of WC as a moderator in the context of small Jordanian restaurants, and enhanced understanding of WC with managers' and supervisors' roles towards their FSB.

6.2. Practical Contributions

The study emphasizes the importance of promoting food safety behavior (FSB) in restaurants, targeting restaurant owners, managers, and supervisors as key players in this endeavor. The study has the following practical contributions:

- Encouraging Food Handlers: Restaurant owners and managers are urged to motivate food handlers to improve their FSB. This can be achieved through verbal communication or by using multilingual posters for better understanding.
- Building Worker Confidence: A culture of safe food preparation should be instilled, fostering worker confidence in their ability to maintain food safety standards.
- Training for Improvement: Restaurant owners should assess food handlers' competency and provide training where needed to enhance their ability to act responsibly.
- Recognition and Encouragement: Acknowledging and appreciating food handlers' efforts in practising FSB can boost their self-confidence and compliance.
- Long-Term Compliance: Encouraging food handlers to adopt sustainable FSB strategies, like documenting practices and monitoring progress, can ensure ongoing compliance.
- Manager and Supervisor Role: Managers and supervisors are highlighted as key figures in promoting FSB through their commitment and example-setting. Hiring and retaining committed staff who comply with FSB-related rules is recommended.
- Socio-Structural Support: Restaurant management should ensure the availability of resources and facilities that support proper food handling. Motivating employees through incentives and counselling can also enhance trust in their ability to manage FSB.
- Training and Education: Public health officials and food safety professionals should focus on training managers and supervisors, as they serve as examples to employees. Educational interventions and cooperation with policymakers are suggested to design effective training programs.
- Government Initiatives: Government authorities and restaurant owners should collaborate on food staff training courses to increase awareness of proper food handling and its consequences. Media consumption and the availability of visual reminders in restaurants can enhance food safety awareness and adherence to standards.

In summary, the study provides valuable insights for enhancing food safety in Jordanian restaurants, emphasizing the role of various stakeholders and recommending strategies to promote FSB and ultimately improve the quality of food service while ensuring public health.

6.3. Limitations and Future Studies

The study used the quantitative approach, which might not be able to provide deeper insights into the topic. It is therefore recommended that future studies consider studying FSB qualitatively. Thus, future studies could combine qualitative and quantitative methods to increase a deeper understanding of FSB. Method combination would enhance knowledge of complex FSB owing to the fact that triangulation complements the shortcomings of one method with the strengths of another. Therefore, it is recommended that restaurant managers' and supervisors' FSB in other countries be studied to obtain in-depth knowledge of FSB. The findings should be generalized with caution, as they were limited to restaurant managers and supervisors in small Jordanian restaurants. Accordingly, generalizing these findings based on evidence from Jordanian restaurants is not appropriate, as the findings are applicable only to contexts similar to that of this study. Furthermore, Jordanian food safety regulations were not examined, which might be a factor that compels restaurant managers and supervisors to implement FSB. The study used the SCT perspective; therefore, it is recommended that future studies use other theories, such as the health belief model, which could also lead to testing of the mediating mechanism, which was not conducted in this study. Further studies are encouraged to include other variables, such as the food safety aspects, social norms, and personal beliefs that affect FSB. This study was one of the first to create a valid and reliable SCT scale, which might inspire future researchers to develop a theory and present practical as well as theoretical implications for improving food safety protocols across distinct food service settings.

7. Conclusion

The present research has explored the impact of food safety-related variables on FSB. The results indicated that restaurant managers' and supervisors' self-efficacy (SE) was a key determinant of FSB. Besides, the results supported all the proposed hypotheses, fostering a positive relation between ED, OE, SE, SR and FSB. Furthermore, it was noted that the higher belief of managers and supervisors in following food safety practices tended to foster higher FSB. Moreover, the supervisors and managers ought to enhance their SR to ensure the successful adoption and execution of FSB in their restaurants. Importantly, managers' and supervisors' environments and expectations of demonstrating their compliance are expected to elevate their FSB. This study focused on SCT food safety and illustrated the challenges and concerns associated with enforcing food safety regulations and the effect on public acceptance. Public perception can be improved by effective food safety practices. To comply with JFDA regulations, the food safety of all Jordanian restaurants must be inspected. The study outcomes can assist public food safety experts and health officials in training Jordanian restaurant food handlers regarding safe food handling procedures.

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Authorship Contribution Statement

Amany Haddad: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization. Abdul Hafaz Ngah: Conceptualization, Methodology, Writing – review & editing.

Declaration of Competing Interest

The authors declare that in this paper they have no known competing financial interests or personal relationships that could have appeared to influence the work.

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