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THE EFFECT OF ATTITUDE TOWARDS UNCERTAINTY AND PERCEIVED CONTAMINATION COGNITION ON MENTAL STATUS OF NURSES DURING THE COVID-19 PANDEMIC

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Abstract: In epidemics, nurses often work on the front line. Therefore, there is a need for studies on the factors affecting the mental states of nurses. This study was conducted to examine the effect of nurses' attitudes towards uncertainty and perceived contamination cognition on mental state during the coronavirus disease pandemic. The study was completed with 328 nurses who filled the data collection forms. Data were tested Mann-Whitney U, Kruskal-Wallis one-way analysis of variance and Spearman correlation tests. In the relational questions were used with simple and multiple linear regression analysis. The average age of the nurses participating in the study was 31.81 ± 7.69, and 84.1% of them were women. All of the participants worked actively during the coronavirus disease pandemic process and 75.0% of them provided care to patients diagnosed with coronavirus disease. Moreover, 68.6% of the participants defined the coronavirus disease pandemic process as frightening/worrying. It was determined that the nurses had high levels of depression, anxiety and stress. While the average score of intolerance of uncertainty was 41.83 ± 8.40, their contamination cognition was 80.34 ± 1.59. A positive relationship was found between intolerance of uncertainty and contamination cognition, depression, anxiety, and stress in nurses. A positive relationship was also determined between contamination cognitions and depression, anxiety, and stress.

Keywords: Mental status, Contamination cognition, Uncertainty, Nurse

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1. Introduction

Pandemics are a condition that exists at every stage of human history and appears as the latest coronavirus disease (Covid-19). Coronavirus is a disease characterized by fever and respiratory distress (Li et al., 2020a). Due to the rapid spread of these symptoms in other countries and regions of the world, the coronavirus epidemic has been defined as a pandemic (Shigemura et al., 2020).

It has been reported that the mental states of nurses and other health professionals were negatively affected in previous epidemics and the Covid-19 pandemic (Kang et al., 2020; Wu et al., 2009). In other epidemics or pandemics like Covid-19, mental distress such as fear, anxiety, depression, posttraumatic stress disorder has emerged in healthcare professionals for reasons such as being isolated, working in high-risk positions and contacting with infected people (Chong et al., 2004; Maunder et al., 2003; Wu et al., 2009). Besides, it has been reported that intolerance of uncertainty, whose severity and importance increases during epidemic and pandemic periods, is an important determinant of psychological well-being (Satici et al., 2020).

1.1. Intolerance of Uncertainty and Mental State

Certainty and uncertainty are fundamental existential dilemma for human beings. Most people do not want to know about the negativities that will happen to them in their lives. According to (Gigerenzer and Garcia-Retamero, 2017), this is called regret of knowing. Because of human nature, person wants to be sure of the future and guarantee it (Grenier et al., 2005). Moreover, people want to understand existing threats and experience a sense of control. Therefore, uncertainty in the current situation can be accepted as an important risk factor that adversely affects the mental state. It is reported that uncertainties increase during epidemics (Li et al., 2019). Unlike other epidemics, Covid-19 spread rapidly and turned into a pandemic. During this pandemic, nurses working in the front lines faced the uncertainty brought about by the Covid-19 pandemic process, in addition to the difficulties they experienced in the supply of personal protective equipment such as masks, gloves and gowns (Jackson et al., 2020). The behavior of individuals against this uncertain pandemic threat plays an important role in minimizing the rate of spread of the pandemic and possible loss of life.

When individuals perceive a situation that threatens their health or encounter a disease, they are stressed and react to this situation cognitively and emotionally (Çırakoğlu, 2011; Hagger and Orbell, 2003). Cognitive processes are thought to be important in dealing with Covid-19 uncertainty as well as in dealing with stress. When individuals first encounter a threat situation, they first evaluate the extent of the danger and then evaluate what can be done to overcome, prevent or decrease. This process involves a complex assessment of a person's coping options (Li et al., 2020b). As a result of these evaluations, individuals may feel threatening, uncontrollable and stressful, as well as higher levels of psychological symptoms and dysphoric mood (Peacock and Wong, 1990). There are many studies reporting that intolerance of uncertainty that emerged during this period negatively affects the mental state of individuals (Rosser, 2019; Swee et al., 2019; Mertens et al., 2020; Parlapani et al., 2020; Satici et al., 2020). However, the number of studies examining the effect of intolerance of uncertainty, which is an important concept in terms of psychopathology, on the mental states of nurses, who has an important place in the Covid-19 process, is quite limited (Aksoy and Koçak, 2020).

1.2. Contamination Cognition and Mental State

Pandemic affects the mental state of individuals as well as their behavior. As a precautionary behavior in possible epidemic or pandemics like Covid-19, people have behaviors such as paying attention to personal hygiene, avoiding contact with others by staying at home, using a face mask when going out, preferring isolated areas (cottage, farm) (Kristiansen et al., 2007). In pandemic situations, individuals' anxiety level and protective behaviors such as excessive hand washing increase. This situation shows that individuals have a fear of contamination during the epidemic or pandemic process (Wheaton et al., 2012). Contamination is one of the most unusual fears in humans. People with an abnormally high fear of contamination may overestimate the likelihood and potential seriousness of this situation (Deacon and Olatunji, 2007). A certain concern about the epidemic can be positive in terms of focus, and motivation of appropriate protective behavior. However, when anxiety becomes excessive, it may impair the functionality of individuals by causing avoidance behaviors (Wheaton et al., 2012).

As a result, the risk of infection to nurses increases due to the fact that Covid-19 is a contagious disease and nurses are at the center of the treatment and care services offered (Huang et al., 2020). This situation affects the threat perceptions of nurses towards their environment and can lead to cognitive and psychological changes. These changes can be reflected in the behaviors of the individual as a result of his/her cognitive evaluations. Nurses may show avoidance behavior in order to remove the perceived threat from their environment and the health behaviors they apply may be out of the ordinary. Particularly, individuals who are afraid of contamination during the pandemic process can make negative cognitive evaluations. The mental state of individuals who may exhibit different health behaviors due to the threat they perceive may be adversely affected. When the literature was examined, it was observed that the studies evaluating the intolerance of uncertainty and mental state of nurses regarding the Covid-19 pandemic were quite limited (Aksoy and Koçak, 2020; Kang et al., 2020), and there was no study on contamination cognitions. Therefore, the study was conducted to examine the effect of nurses' attitudes towards uncertainty and perceived contamination cognition on mental state during the Covid-19 pandemic, which is a source of uncertainty and a high risk of contamination. Cognitive processes are closely related to mental health and can be changed by training such as psychoeducation and awareness. It is thought that the results of the study will contribute to the literature in the creation of preventive counselling programs that will be offered to nurses who are at the center of health services in this process.

2. Materials and Methods

2.1. Research Questions

The questions in the research are presented below;

i. During the Covid-19 pandemic, do intolerance of uncertainty, contamination cognitions and mental status in nurses change according to socio-demographic variables?

ii. Is there a relationship between intolerance of uncertainty, contamination cognitions and mental state during the Covid-19 pandemic?

iii. Did the intolerance of uncertainty in the Covid-19 pandemic affect the contamination cognition of nurses?

iv. Did the intolerance of uncertainty, and contamination cognitions affect the mental states of nurses during the Covid-19 pandemic?

2.2. Methods

2.2.1. Study design and sample size

Data were collected between June 2020 and November 2020. The population consisted of 1200 nurses working in a public hospital during the Covid-19 pandemic period. The sample calculation was made with a known population. In the sample calculation, case numbers of the Ministry of Health on June 2020 were based and the sample size was determined as 328 people with 95% reliability. The nurses included in the study were selected by a simple random method. Considering that there might be missing data, it was decided to collect data from 335 nurses. The study was completed with 328 nurses who completed the data collection forms. Nurses over the age of 18, who did not have any mental illness, and who agreed to participate in the study were included in the study.

2.2.2. Data collection tools

The data were collected using "Introductory Information Form", "Intolerance of Uncertainty Scale (IUS-12)", "Depression, Anxiety and Stress Scale (DASS-21)" and "Contamination Cognition Scale". The data were collected online due to the Covid-19 pandemic.

2.2.3. Introductory information form

In this form prepared by the researcher based on the literature (Ekiz et al., 2020), there are a total of 10 questions about the individuals' age, gender, educational status, and professional experience.

2.2.4. Short form of intolerance of uncertainty scale (IUS-12)

The Turkish validity and reliability adaptation of the scale, which was developed by Carleton, Norton, and Asmundson (2007), was made by (Sarıçam et al., 2014). The scale evaluates the tendency to negatively react emotionally, cognitively, and behaviorally to uncertain events and situations (Sarıçam et al., 2014). The Cronbach α coefficient for the total of the scale was determined as 0.88 (Sarıçam et al., 2014). In our study, this value was determined as 0.86.

2.2.5. Depression, anxiety and stress scale (DASS-21)

Sarıçam (2018) made the psychometric properties of the Turkish version in normal and clinical samples of the scale, which was developed by Lovibond and Lovibond (1995). Test-retest correlation coefficients in the normal sample were r = 0.68 for the depression subscale, r = 0.66 for the anxiety subscale, and r = 0.61 for the stress subscale. When an individual gets a score of 5 points and above from the depression sub-dimension, 4 points or more from anxiety, 8 points or more from stress, it is indicated that he/she has a problem (Sarıçam, 2018). In our study, Cronbach's αlpha values were determined as 0.89 for anxiety, 0.91 for depression, and 0.80 for stress.

2.2.6. Contamination cognition scale (CCS)

Deacon and Olatunji (2007) developed it to evaluate the perceived threat level regarding the possibility of contamination and the consequences of this possibility. Its Turkish validity and reliability were performed by İnözü and Eremsoy (2013). The Cronbach's α value of the scale was found to be 0.97 (İnözü and Eremsoy, 2013). In our study, this value was determined as 0.97.

2.2.7. Data collection

Current situation regarding the coronavirus process was not fully clear, so the data forms were sent to the nurses via Google Forms. An "Informed Volunteer Form" was placed in the Google Form and the volunteer approval tab was necessary. A preliminary interview was held with the nurses included in the sample, their phone numbers were taken and a link to the questionnaire was sent.

2.3. Statistical Analysis

The data obtained from the research were evaluated in the SPSS 25 (IBM SPSS Statistics Standard Concurrent User V 25) package software. Number (n), percentage (%), mean and standard deviation (SD) were used as descriptive statistical methods. The Kolmogorov-Smirnov test and QQ plot were used to evaluate the suitability for normal distribution of the data and it was observed that there was no normal distribution ($p < 0.05$). For this reason, the Mann-Whitney U test was used in the evaluation of double independent groups, and the Kruskal-Wallis one-way analysis of variance was used in the comparison of three or more independent groups. Spearman correlation was used for correlation analysis. Relational questions were tested with simple and multiple linear regression analysis. In all comparisons, $p < 0.05$ was considered statistically significant.

3. Results

The average age of the nurses participating in the study was 31.81 ± 7.69, 84.1% were women, 77.1% had a bachelor's degree, 36.9% had been working for 11-15 years, 55.2% were married, 51.5% did have children, and 79% of them had no chronic disease. All of the participants worked actively during the Covid-19 pandemic, around 44.8% of them knew a person who diagnosed with Covid-19, 75.0% gave care to the patient diagnosed with Covid-19, and 90.0% of them reported that their cleaning habits changed during this process. Furthermore, 68.6% of the participants defined the Covid-19 pandemic as frightening/worrying.

Table 1 shows the mean scores obtained by the nurses from the scales according to their sociodemographic characteristics. Accordingly, it is seen that intolerance of uncertainty does not differ according to gender (P>0.05), whereas women's contamination cognition, depression, anxiety and stress mean scores were higher than men (P<0.05). When the scale scores were examined according to marital status, it was determined that the mean scores of anxiety did not differ according to the groups (P>0.05), and the mean scores of the married individuals were higher than the singles in all other scales (P<0.05). Besides, it was observed that having children did not affect anxiety scores similarly (P>0.05), and in all other scales, the mean scores of those who had children were higher than the mean scores of those who did not have children (P<0.05). Moreover, it was found that the average scores in all scales of those with a working period of 11-15 years were higher than individuals with other working periods (P<0.05). It was observed that the contamination cognition, anxiety and stress mean scores of those with chronic diseases were higher than individuals without chronic diseases (P<0.05). Moreover, it was determined that the mean scores of nurses who evaluated the Covid-19 process as frightening/worrying were higher than other groups (P<0.05).

Table 1. Score means of IUS-12, DASS-21 and CCS scales according to the descriptive characteristics of the nurses (n = 328)

Variables	IU	CC	D	A	S
	Mean ± SD (Median)				
Gender					
Female	42.13±8.23 (43.00)	80.55±10.40 (80.00)	10.32±5.85 (10.00)	8.58±5.54 (8.00)	10.67±5.50 (11.00)
Male	40.25±9.21 (39.50)	70.23±20.04 (70.00)	7.80±5.47 (8.00)	6.46±5.38 (6.00)	8.88±4.73 (9.00)
Statistical analysis	Z*-1.511 P=0.131	Z*-4.772 P<0.001	Z*-2.742 P<0.01	Z*-2.525 P<0.05	Z*-2.117 P<0.05
Marital status					
The married	43.12±8.30 (43.00)	80.70±10.40 (81.00)	10.56±5.99 (10.00)	7.88±5.62 (9.00)	11.13±5.39 (11.00)
Unmarried	40.25±8.28 (40.00)	70.91±10.71 (71.00)	9.13±5.60 (9.00)	7.68±5.47 (6.00)	9.46±5.33 (10.00)
Statistical analysis	Z*-3.089 P<0.01	Z*-4.674 P<0.001	Z*-2.062 P<0.05	Z*-1.786 P=0.074	Z*-2.672 P<0.01
Having a child					
Yes	43.05±8.23 (43.00)	80.71±10.40 (81.00)	10.63±5.92 (10.00)	8.61±5.52 (9.00)	11.10±5.24 (11.00)
No	40.53±8.41 (40.00)	70.96±10.69 (71.00)	9.16±5.70 (9.00)	7.86±5.61 (7.00)	9.62±5.52 (10.00)
Statistical analysis	Z*-2.878 P<0.01	Z*-4.435 P<0.001	Z*-2.169 P<0.05	Z*-1.288 P=0.198	Z*-2.429 P<0.05
Working time					
0-1 year	39.57±8.64[a] (39.00)	80.05±10.50[a] (84.00)	8.95±5.61[ab] (9.00)	7.59±5.59[ab] (6.00)	9.18±5.60[a] (9.00)
2-5 years	41.96±7.77[ab] (42.00)	70.57±20.07[a] (81.00)	8.17±5.06[a] (9.00)	6.68±5.09[a] (6.00)	8.87±4.41[a] (9.00)
6-10 years	42.30±8.49[ab] (43.50)	80.65±10.35[b] (91.00)	10.19±5.90[ab] (9.50)	8.30±5.65[ab] (8.00)	11.20±5.40[ab] (11.50)
11-15 years	43.38±8.13[b] (43.00)	80.67±10.44[b] (91.00)	11.14±6.06[b] (11.00)	9.30±5.52[b] (9.00)	11.36±5.42[b] (11.00)
Statistical analysis	KW**11.610 P<0.01	KW**21.363 P<0.001	KW**11.223 P<0.05	KW**9.435 P<0.05	KW**13.331 P<0.01
The situation of chronic diseases					
There is	43.32±8.26 (44.00)	80.91±10.17 (83.50)	10.67±6.64 (12.00)	10.23±6.62 (11.00)	11.59±5.77 (13.00)
None	41.50±8.41 (42.00)	80.22±10.64 (83.00)	9.75±5.67 (9.00)	7.81±5.22 (7.00)	10.12±5.32 (10.00)
Statistical analysis	Z*-1.689 P=0.091	Z*-2.917 P<0.01	Z*-1.138 P=0.255	Z*-2.670 P<0.01	Z*-2.024 P<0.05
Familiarity with COVID-19					
There is	42.40±8.06 (42.00)	80.40±10.48 (84.50)	10.89±5.84 (11.00)	9.08±5.78 (9.00)	11.29±5.53 (11.00)
None	40.09±8.66 (42.00)	80.05±10.68 (83.00)	9.13±5.73 (9.00)	7.57±5.30 (7.00)	9.64±5.23 (9.00)
Statistical analysis	Z*-0.768 P=0.443	Z*-0.254 P=0.799	Z*-2.714 P<0.01	Z*-2.403 P<0.05	Z*-2.718 P<0.01
General thoughts on the COVID-19 process					
A normal process	38.14±5.57[a] (38.00)	60.60±20.60[a] (70.50)	7.07±7.24[a] (4.50)	6.07±5.38[a] (6.50)	8.00±5.87[a] (7.50)
An uncertain process	39.21±9.24[a] (40.00)	80.15±10.65[ab] (84.50)	8.38±5.46[a] (9.00)	6.79±5.27[a] (6.00)	9.19±5.34[a] (9.00)
A frightening / worrying process	43.10±7.91[b] (43.00)	80.53±10.41[b] (85.50)	10.71±5.76[b] (10.00)	8.96±5.57[b] (9.00)	11.00±5.33[b] (11.00)
Statistical analysis	KW**15.991 P<0.001	KW**9.827 P<0.01	KW**13.103 P<0.01	KW**11.646 P<0.01	KW**10.601 P<0.01

*Mann-Whitney U test, **Kruskal-Wallis test, IU= intolerance of uncertainty, CC= contamination cognitions, D= depression, A= anxiety, S= stress, SD= standard deviation

Correlations between variables are given in Table 2. A positive and significant relationship was found between intolerance of uncertainty and contamination cognitions (r=.211, P<0.001), depression (r=.402, P<0.001), anxiety (r=.369, P<0.001), stress (r=.415, P<0.001) and age (r=.162, P<0.01) variables. A positive and significant relationship was found between contamination cognitions and variables of depression (r=.161, P<0.01), anxiety (r=.169, P<0.01), stress (r=.244, P<0.001), and age (r=.209, P<0.001). Furthermore, there was a positive and highly significant relationship between depression and anxiety (r=.853, P<0.001) and stress (r=.880, P<0.001) variables.

Table 2. Mean scores (standard deviation (SD) and bivariate correlations among the study variables (n = 328)

Variables	Mean (SD)	1.	2.	3.	4.	5.	6.
1. IU	41.83 (8.40)	1					
2. CC	80.34 (1.59)	.211**	1				
3. D	9.92 (5.86)	.402**	.161*	1			
4. A	8.25 (5.57)	.369**	.169*	853**	1		
5. S	10.38 (5.42)	.415**	.244**	.880**	.866**	1	
6. Age	31.81 (7.69)	.162*	.209**	.149*	.103	.149*	1

*P<0.01, **P<0.001 (p values according to the Spearman'srho test); IU= intolerance of uncertainty, CC= contamination cognitions, D= depression, A= anxiety, S= stress

The predictive effect of intolerance of uncertainty on contamination cognition in nurses is examined in Table 3. According to Model 1, nurses' intolerance of uncertainty explained their contamination cognition by 4.6%. According to the standardized regression coefficients (β), the relative effect of intolerance of uncertainty on contamination cognitions was β=0,214, t=3,953, P=0,001 (Table 3).

The predictive effect of nurses' intolerance of uncertainty and contamination cognitions on the mental state (depression, anxiety, and stress) is examined in Table 4. Accordingly, it is seen that intolerance of uncertainty and contamination cognitions had a significant effect on the mental state (depression, anxiety, stress). According to Model 2, intolerance of uncertainty (t=7.36, P=0.001) and contamination cognitions (t=2.20, P=0.028) had a significant effect on depression. Intolerance of uncertainty and contamination cognitions explained 17.5% of the variance in depression. According to Model 3, intolerance of uncertainty (t=6.70, P=0.001) and contamination cognitions (t=2.28, P=0.023) had a significant effect on anxiety. Intolerance of uncertainty and contamination cognitions explained 15.5% of the variance in anxiety. In Model 4, it is seen that intolerance of uncertainty (t=7.58, P=0.001) and contamination cognitions (t=3.69, P=0.001) had a significant effect on stress and 21.1% of the variance in stress was explained by this model.

Table 3. Predictive effect of intolerance of uncertainty on contamination cognitions (n=328) §

Variables	B	Std. Error	β	t	P
Model 1 Contamination Cognitions	R=0.214;	R^2=0.046;	Adjusted R^2:0.043;	$F_{(1.326)}$:15.628;	P<0.001
Intolerance of Uncertainty	0.041	0.010	0.214	3.953	0.001*

§Simple linear regression, *P< 0.01

Table 4. Predictive effect of intolerance of uncertainty and contamination cognitions on mental state (n = 328) §

Variables	B	Std. Error	β	t	P
Model 2, Depression	R=0.419;	R^2=0.175;	Adjusted R^2:0.170;	$F_{(2.325)}$:34.588;	P<0.001
Contamination Cognitions	0.418	0.189	0.114	2.205	0.028*
Intolerance of Uncertainty	0.265	0.036	0.380	7.363	0.001**
Model 3, Anxiety	R=0.393;	R^2=0.155;	Adjusted R^2:0.149;	$F_{(2.325)}$:29.722;	P<0.001
Contamination Cognitions	0.417	0.182	0.119	2.286	0.023*
Intolerance of Uncertainty	0.232	0.035	0.350	6.704	0.001**
Model 4, Stress	R=0.460;	R^2=0.211;	Adjusted R^2:0.207;	$F_{(2.325)}$:43.574;	P<0.001
Contamination Cognitions	0.634	0.172	0.186	3.695	0.001**
Intolerance of Uncertainty	0.247	0.033	0.382	7.584	0.001**

§Multiple linear regression, *P< 0.05, **P< 0.01.

4. Discussion

As in other pandemics in the world, healthcare professionals, especially nurses, are actively involved in the Covid-19 pandemic and their psychological conditions are negatively affected (Kang et al., 2020; Wu et al., 2009). In our study, it is seen that the participants' mean scores for depression, anxiety, and stress were moderate and high. It is very important to reveal the reasons for the psychological status of nurses, who are one of the pioneers of health care services, in such pandemics. In this study, it was first examined whether there was a relationship between the demographic characteristics of the nurses and their scores on the scales. In our study conducted for this purpose, it is seen that there was no significant change in the average of intolerance of uncertainty according to gender ($P>0.05$). This finding is consistent with the data of (Aksoy and Koçak, 2020) study with Turkish nurses and midwives. Furthermore, it was found that the contamination cognition, depression, anxiety and stress mean scores of the women were high ($P<0.05$). In the study conducted by Arpacıoğlu et al. (2021), it was found that the mean scores of fear of Covid-19, burnout and depression were high in female health care professionals. Considering the relationship between cognition and emotion, this finding seems to be supported. It has been also reported that the fear of contamination is higher in women (Gilbert, 2019). Besides, it has been stated that intolerance of uncertainty, fear and depressive symptoms associated with Covid-19 are more common in women (Parlapani et al., 2020). This may be due to the fact that the right orbitofrontal cortex and amygdala are more active in women. This activation means that emotional and cognitive processing work largely in parallel (Koch et al., 2007). There are also data that women use more negative coping skills as they get older (Nolen-Hoeksema and Aldao, 2011). In our study, it was observed that all variables were negatively affected by the increase in working time. Moreover, the majority of the participants were women and had six years or more years of working. In addition to being a woman and advancing age, it is thought that negative experiences in a long working life and exhaustion may also have had an effect on this negative situation.

In our study, it is seen that participants who were married and having child had high averages in terms of all variables except anxiety. At the time of the study, due to factors such as the high infectiousness of the Covid-19 virus and the lack of a vaccine, intolerance of uncertainty and negative cognition score averages may have increased. In addition, considering the responsibilities of these participants towards their spouses and children, it can be interpreted as an expected result that their anxiety to infect their close relatives and their mental state were negatively affected. Similar to our study, there are also studies reporting that intolerance of uncertainty and cognition for contamination negatively affect the mental state (Hill and Hamm, 2019; Jalal et al., 2018; Tanrıverdi and Tanrıverdi, 2021).

In our study, it was found that the mental states of the nurses, who knew people diagnosed with Covid-19, were negatively affected. Tanriverdi and Tanriverdi (2021), in their study examining the effects of Covid-19 on the mental health of health care professionals, reported that individuals had to cope not only with the threat of the disease, but also with the burden of illness or death of their relatives.

In this study, all of the nurses worked actively in this process and witnessed the negative effects of the Covid-19 virus on individuals. The fact that these negative consequences also happened to relatives/friends or the possibility of them may have negatively affected the mental state of the participants.

Besides, it was observed that the nurses who evaluated the Covid-19 process as frightening/worrying had high mean scores for all scales. This finding partially complies with the findings study of Aksoy and Koçak (2020). This situation can be explained by the argument that cognitive processes cannot be considered separately from emotional processes. It is known that emotion and cognition are not separate systems, and there are rich and dynamic interactions between brain networks in complex cognitive-emotional and behavioral processes (Pessoa, 2008). Therefore, the mental state of the participants who perceived and evaluated the situation negatively may also be negatively affected (Table 1).

For the other questions of our study, a positive significant relationship was found between study variables (Table 2). Moreover, it was observed that intolerance of uncertainty and contamination cognitions negatively affected the mental state (anxiety, depression, stress) both separately and together (Table 3 and Table 4). We believe that these findings should especially be highlighted and will contribute to the literature. It has been reported in previous studies that intolerance of uncertainty increases fear of Covid-19 and negatively affects mental state (anxiety, depression, stress, anxiety, etc.) (Mertens et al., 2020; Rosser, 2019; Swee et al., 2019). During the Covid-19 pandemic, which was great uncertainty, intolerance of uncertainty, which had a psychologically transdiagnostic nature (Rosser, 2019), increased and negatively affected mental health (Swee et al., 2019). Carleton (2016) also reported that intolerance of uncertainty is a transdiagnostic vulnerability factor. Considering the current Covid-19 pandemic, it was observed that the high level of uncertainty increased the fear of coronavirus and negatively affected the contamination cognition. In this context, contamination cognition is thought to be a defense model similar to intolerance of uncertainty.

It is known that the Covid-19 pandemic negatively affected the mental state of healthcare professionals, especially nurses (Kang et al., 2020). We think that our study will make a significant contribution to the literature in terms of revealing the reasons for this negative situation in nurses. Moreover, Covid-19 may

have increased the perception of the danger of individuals due to its high risk of contamination and morbidity and mortality risk (Li et al., 2020a). 68.6% of the participants described the Covid-19 pandemic as frightening/worrying. In addition, the fact that the vast majority (75.0%) of the nurses participating in the study had close contact with patients diagnosed with Covid-19 and had a decisive role in the spread of contamination (Kharma et al., 2015) may have negatively affected the cognition of contamination. Besides, the fact that more than half of the participants were married and had children and increased the sense of responsibility towards their spouses and children might have negatively affected their intolerance of uncertainty and contamination cognition. As a conclusion, this negativity may have increased the anxiety, depression and stress levels of the nurses.

5. Conclusion and Implications

It is known that the mental state of all healthcare professionals, especially nurses, was negatively affected in Covid-19-like pandemics. In this process, different consultancy programs for health professionals are also carried out. It is thought that it would be beneficial to add specific topics such as contamination cognition in addition to anxiety, depression and stress coping skills to these programs. Furthermore, it is thought that investigating intolerance of uncertainty and other factors that affect the development of contamination cognition will contribute to the regulation of these cognitive structures. It is remarkable that the mental states of nurses who were married and had children were affected more in our study. Nurses and their families should be encouraged to participate together in the counselling programs that are offered for this purpose.

Limitations and Strengths of Study

It should be accepted that our study has some limitations. Since this study has a cross-sectional design, the results involve instant assessments. It is thought that a longitudinal research will be a more suitable design for investigating, in terms of the established model, the relationships and causality over time. Also, although our research sample was considered adequate for analyzing the established model, it is assumed that a larger sample will allow us to go beyond our existing analysis level for studying the differences of both dependent and independent variables (e.g. gender and age). The answers given by the participants to the data collection instruments, which were used for the dependent variables in the established model, were considered correct, but the answers given to the study are limited with the scale items. Strengths of the research are sufficient sample size and statistical method used.

Author Contributions

Concept: M.E. (50%) and N.Ş. (50%), Design: M.E. (50%) and N.Ş. (50%), Supervision: M.E. (50%) and N.Ş. (50%), Data collection and/or processing: Ö.Ö. (100%), Data analysis and/or interpretation: M.E. (50%) and N.Ş. (50%), Literature search: M.E. (34%), Ö.Ö. (33%) and N.Ş. (33%), Writing: M.E. (34%), Ö.Ö. (33%) and N.Ş. (33%), Critical review: M.E. (34%), Ö.Ö. (33%) and N.Ş. (33%), Submission and revision M.E. (34%), Ö.Ö. (33%) and N.Ş. (33%). All authors reviewed and approved final version of the manuscript.

Conflict of Interest

The authors declared that there is no conflict of interest. The authors alone are responsible for the content and writing of the article.

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Ethical Approval/Informed Consent

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