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## The Impact of the COVID-19 Pandemic on the Dietary of Malay Hypertensive Patients

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### Abstract

Implementing infection control measures during the COVID-19 pandemic has resulted in dietary restrictions among hypertensive patients. This study aimed to explore the dietary management among Malay hypertensive patients during COVID-19. The results outlined divergent changes in dietary practices among participants, including improvement, worsening, as well as no changes. The effect of the pandemic has both negatively and positively impacted on dietary, which could have a substantial impact on the population's health in the short and long term if they are sustained.

Keywords: Dietary ; Physical Activity ; Covid-19 ; Hypertension

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### 1.0 Introduction

Uncontrolled hypertension can lead to coronary heart disease and stroke by damaging and weakening blood vessels, causing them to narrow, rupture, and leak (Sidhartha et al., 2015). Without proper treatment and management, it may lead to death. Therefore, complying with both pharmacological and non-pharmacological interventions will reduce the blood pressure level (Whelton et al., 2018). Non-pharmacological intervention can be achieved through lifestyle modification, weight management, dietary modification, smoking cessation, and physical activity (Mahmood et al., 2019; MOH, 2018; Ozemek et al., 2017).

By implementing diet modifications, it is effective in lowering blood pressure in patients with hypertension (Lee et al., 2018). Nevertheless, in response to the COVID-19 outbreak, several countries implemented stringent measures, including "physical distancing" or lockdown, to curb the virus's infection (Bennett et al., 2021; Tang, 2020; Wang et al., 2021). Hence, people spend more time inside and have limited physical activity, indirectly influencing dietary habits. In Malaysia, a movement control order (MCO) has been implemented to lower the risk of viral transmission among the community and overburden the country's health system (Azlan et al., 2020).

It is undeniable that MCO enforcement has had a negative impact on all services, including healthcare. According to the World Health Organization (WHO), fifty-nine percent (59%) of countries have restricted access to outpatient treatments (essential non-communicable disease care) to some extent, with 4% reporting complete closure (WHO, 2020a). Malaysia has cut the number of outpatient clinics from 250-300 to 30-40 each week (Khor et al., 2020). Clinics will be open only to patients who require immediate post-operative care and those who require urgent intervention alone. This massive response to COVID-19 may have jeopardized the routine treatment frequently needed

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of patients with non-communicable diseases (NCDs), including hypertension. Additionally, according to The Lancet Global Health research, people with underlying NCDs are at a greater risk of developing severe COVID-19-related illness or death (The Lancet, 2020).

As the number of clinic visits for NCDs patients, particularly hypertensive patients, continues to decline and be postponed, this circumstance may have resulted in inadequate patient care maintenance, resulting in a poor quality of life. One of the aspects incorporated in the domain environment for overall quality of life and general health is the opportunities for new information and skills (WHO, 2020b). Patients with hypertension may experience a decrease in their quality of life due to limited access to knowledge and skills, particularly nutrition education. In addition, the stay-at-home circumstance may restrict an individual's physical movement and daily intake, which may significantly impact dietary management among hypertensive patients.

Another study by Almandoz et al. (2020) reported that the COVID-19 pandemic had a significant impact on patients with obesity since the stay-at-home orders were initiated, including difficulty in losing weight, less exercise time, increased stockpiling of food, and stress eating. Besides, quarantine orders could have a long-term effect on cardiovascular disease as they are associated with stress and depression, leading to an unhealthy diet and reduced physical activity (Mattioli et al., 2020). In contrast, Lamarche et al. (2021) highlighted an improvement in diet quality, and the prevalence of food insecurity was reduced among adults from Quebec. However, the findings may apply to generally healthy populations.

In Malaysia, we noted that no study has explored hypertensive patients' experiences of dietary management during COVID-19 and how they dealt with the circumstances. Thus, the present study aimed to explore the experiences in dietary management during COVID-19 among Malay hypertensive patients in Malaysia.

## 2.0 Methodology

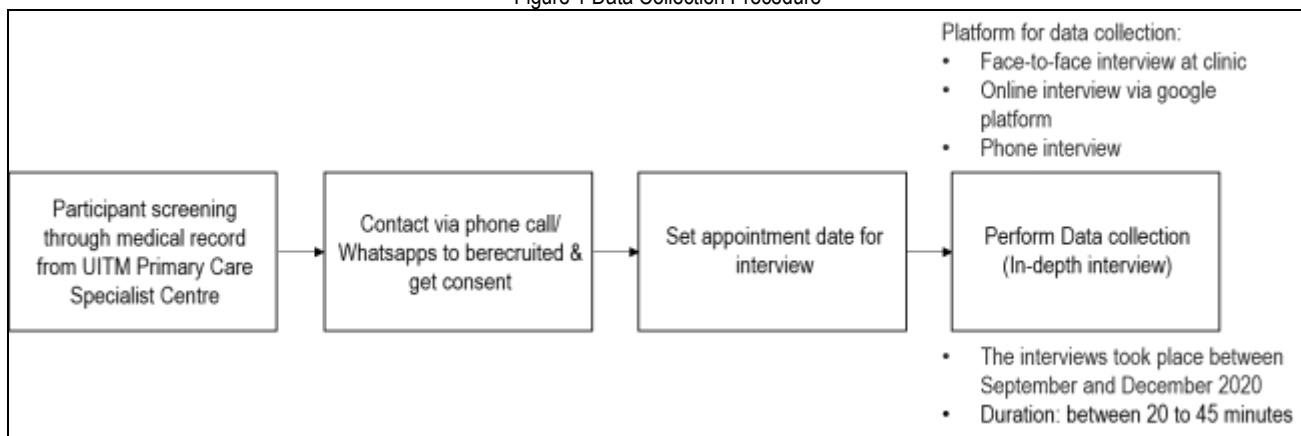
An in-depth interview was conducted among hypertensive patients attending UiTM Primary Care Specialist Clinic. This approach was chosen to identify the individual perceptions, beliefs, feelings, and experiences as it can gain in-depth information, identify personal experiences and identify the context of participants' lives (Hennink et al., 2020).

### 2.1 Participants and Recruitment

The purposive sampling method was chosen as it involves identifying and selecting individuals or groups of proficient and well-informed individuals with a phenomenon of interest (Etikan, 2016; Robinson, 2014). The inclusion criteria of participation in the study were: 1) Malay, 2) Age between 18-49 years old, 3) Has been diagnosed with primary hypertension, 4) Willing to participate, 5) Computer literate. Malay ethnics were chosen as target participants due to the highest prevalence of hypertension, at 32.2%, followed by Indians at 30.6% and Chinese at 28.1% (NIH, 2019). According to Hennink et al. (2017), 16 to 24 interviews among participants were needed to reach meaning saturation, where we developed a richly textured understanding of issues. However, code saturation can be reached at nine interviews.

Before conducting the interview, the researcher screened patients' medical records at the clinic to identify the potential participant and contacted them via phone call or WhatsApp for recruitment. They were given an information sheet on the study and a consent form. Once the patients agree to participate, the researcher sets the appointment date with the participants for the interview. The procedure was conducted as the figure below (Figure 1).

Figure 1 Data Collection Procedure



### 2.2 Data collection

Fourteen in-depth interviews were conducted, of which nine were by telephone, 2 was computer-based audio call (Google Meet), and 3 were face-to-face between September and December 2020. The duration of each interview took between 20 to 45 minutes to complete. Face-to-face interviews were conducted at the clinic, following the standard operating procedures (SOP) from Majlis Keselamatan Negara (MKN) and UiTM. Meanwhile, an online video or phone interview was done in a private room with reliable internet or telephone connections. Telephone or online video is a safer option due to the risen of COVID-19 cases. A semi-structured questionnaire was prepared using a

guided interview to get information from patients. The primary investigator gave the participants questions and further probes to achieve the objective of an in-depth interview (*Prolonged Engagement*). The discussions were audiotaped using Zoom H4N Pro 4-Channel handy recorder, and field notes were utilized during every interview (*Methodological Triangulation*).

### 2.3 Data Analysis

Content analysis methods were implemented to describe patients' experiences in dietary management during COVID-19 as its goal is to link the results to their context or to the environment in which they were produced (Bengtsson, 2016). Textual data were read several times to identify the themes and categories (*Persistent Observation*). Numerous codes were identified, and relevant quotes were categorized under each code using Atlas.ti V.8 software. To ensure all aspects of data were identified, the final list of categories and sub-headings will be compared with the original transcript. At this saturation point, a conclusion was reached as there are no new themes (*Data Triangulation*). The transcripts, emerging and final categories, subthemes, and themes were reviewed and assessed by two qualified peer researchers (*Peer Debriefing*) (Nowell et al., 2017). The study was conducted and reported following the Standards for Reporting Qualitative Research (SRQR).

### 3.0 Findings

The characteristics of the sample are shown in Table 1. The majority of participants were male (64%, 9/14) and married (92%, 13/14). Of the 14 participants, 8 (57%) were in the range of age groups 40-49 years old, while the rest (6/14, 43%) were 18-39 years old.

Table 1 Characteristics of Interviewed Patients (N: 14)

ID	Age	Sex	Marital Status	Educational Level	Employment Status	Working Status During Covid-19	Co-Morbidities
001	39	Male	Married	Tertiary Education	Employed	Working from Home (WFH)	- Hyperlipidemia - Impaired Fasting Glucose
002	38	Female	Married	Tertiary Education	Employed	Partial Working from Home - Frontliner)	- Obesity - Hyperlipidemia
003	39	Male	Single	Tertiary Education	Employed	Working from Home (WFH)	- Hyperlipidemia - Fatty Liver - Allergic - Obstructive Sleep Apnea (OSA)
004	38	Female	Married	Tertiary Education	Employed	Working from Home (WFH)	- N/A
005	39	Male	Married	Tertiary Education	Employed	Partial Working from Home	- Diabetes Mellitus
015	43	Male	Married	Tertiary Education	Employed	Partial Working from Home	- Gout
016	43	Female	Married	Tertiary Education	Employed	Partial Working from Home	- Obstructive Sleep Apnea (OSA)
021	45	Male	Married	Tertiary Education	Self-Employed	Partial Working from Home	- Diabetes - Hyperlipidemia - Obstructive Sleep Apnea (OSA)
024	46	Male	Married	Tertiary Education	Employed	Fully Working	- Gout
025	46	Male	Married	Tertiary Education	Employed	Fully Working – Essential Group	- Diabetes - Hyperlipidemia - Obesity - Obstructive Sleep Apnea (OSA)
028	47	Male	Married	Tertiary Education	Self-Employed	Fully Working	- N/A
033	48	Male	Married	Tertiary Education	Employed	Partial Working from Home	- Diabetes - Hyperlipidemia - Cardiovascular Disease
034	48	Female	Married	Tertiary Education	Employed	Not Working During MCO. Fully Working During RMCO	- Diabetes
040	37	Female	Married	Tertiary Education	Employed (Partial WFH)	Partial Working from Home	- PCOS - Hyperlipidemia - Fatty Liver - Impaired Fasting Glucose

During the interviews, the participants discussed their experiences in dietary management for hypertension throughout the pandemic. Three main themes formed based on this study's findings: 1) No changes, 2) Improves in diet/habit, 3) Worsen in diet/habit.

Table 2 Summary of Experience in Dietary Management During Covid-19 Among Malay Hypertensives Patients

Themes	Subthemes	Category
No changes	Eat the same as usual	Eat as usual, the same type of meal and routine as before the pandemic
		Eat as usual, rarely buy food outside because always cook at home
		Not much changes because in the process of diet control
Improved in diet/habit	Portion control	Food choices still same, but control portion by following quarter, quarter, half rule
		Control food portion and reduce sugary drinks
	Cooking at home	Cook by themselves/ eat at home because of fear of infected/restricted movement order by the government
		Cook by themselves/ eat at home because of financial (reduced salary)
		Start to practice cooking
		Able to cook because more time at home
	Proper meal timing	Able to control the type of ingredient used because mainly cooking by themselves
		Aware of meal timing, more discipline, eat only during the main meal to avoid the snacking habit
	Low salt diet	Avoiding high salt food
		Reduce additional salt in cooking
	Self-control	Better self-control with food choices and portion due to health conditions
		Came home late due to work, but try to self-discipline with meal timing
	Less eating outside	Improve self-control in buying food outside due to financial, priority and long queue at the restaurant
Bring packed lunch that prepared at home because the restaurant near at working place was close		
No eating at late midnight (restaurant) because of limited operating hours		
Fasting	Fasting because feel lazy to eat everyday	
Worsen in diet/ habit	Poor food choices	Poor food choices influenced by family members
	Overeating	Overeating influenced by snacking with family
		Uncontrolled food intake because staying at home
	Buy outside food	Buy outside food because of time limitation and work
		Able to buy outside food through delivery

### 3.1 Theme 1: No changes in dietary management among Malay hypertensive patients during COVID-19

Several respondents (29%, 4/14) had reported that their dietary management is the same as usual. Some of them have the same type of meal and routine as before the pandemic. *“The situation is kind of normal. We still eat what we usually eat.”* [Participant 004]. Another respondent indicated that they eat as usual because they are used to cooking at home before. As noted by the female respondent: *“We always prefer to eat at home since before pandemic. Even if I return home at 8.00 p.m., I will cook. With the current COVID-19 situation, my husband said that eating at home is better than eating out.”* [Participant 004]

### 3.2 Theme 2: Improves in dietary management among Malay hypertensive patients during COVID-19

The majority of participants (79%, 11/14) indicated that they had improved in their diet or habit throughout the COVID-19 pandemic, represented by seven subthemes.

#### Portion control

Two out of the fourteen participants acknowledged that they could control their food portions during the pandemic. As mentioned by Participant 025: *“I realize I started to gain weight because of my sugar consumption. Before this, I used to drink a lot of canned drinks and eat a large portion of rice. I do not have much time to exercise. Since I have gastric, I continue to eat as usual but control them by limiting my portions.”* Besides, Participant 002 asserted that she began to minimize her portion intake during the containment measure by emphasizing the Malaysian Health Plate (MHP), which emphasises ‘Suku Suku Separuh’.

#### Cooking at home

Nine of these respondents (64%) agreed that this pandemic situation had led them to start cooking at home. Participant 002 reported: *“In terms of my dietary intake during this pandemic, we were unable to buy food outside due to the MCO. Hence, if we want to eat a specific menu, either we cook it ourselves, or we do not eat it.”* Another patient, Participant 016, shared that his family tends to cook their food as they are afraid and aware of the risk of infection once they go out.

Participants 025 and 040 highlighted that their families have started cooking at home as they have more time than before the pandemic. As Participant 040 noted: *“We used to buy outside food because I did not have time to cook in the evenings after work. At lunch, I ate food from the canteen. Nevertheless, during this COVID-19 pandemic, I always stay at home. Thus, I cook on my own now.”*

Meanwhile, some participants highlighted that staying at home during pandemics has led them to start practicing healthy cooking on their own. One said: *“In terms of diet, it is vastly different from what it was previously. We began to cook more at home rather than eat out.”*

*I bought an air-fryer to assist me in the kitchen. I learned a lot of new things, like how to cook on my own. We can all afford to improve our diets for a better lifestyle.* “

#### Proper meal timing

In addition to mentioning cooking at home and portion control, interviewees also discussed having proper meal timing during the COVID-19 pandemic. *“During the containment measure, I do not crave to eat all sort of things due to boredom. I became more aware of my meal timing and avoided eating outside of the main meal regularly.”* Participant 002. This participant also highlighted that she feels more disciplined by proper meal timing and can avoid unnecessary snacking.

#### Low salt diet

Two out of fourteen participants responded that they could now practice a low salt diet properly because they were able to cook by themselves. *“At home, we can manage our salt intake properly. For example, when we cook pasta, I only add white pepper. If any family members want to add salt, they can add it by themselves later.”* said Participant 021. He further mentioned that he always avoids any food that tastes salty right away. Moreover, Participant 024 also highlighted that he controls his dietary management by reducing salt in cooking.

#### Self-control

Participant 024 asserted that he tries to self-discipline with his meal timing by eating dinner before 9 p.m. If he feels hungry late at night, he will eat some snacks for supper. He also mentioned that due to financial constraints and a long wait at the restaurant, he has begun to exercise better self-control when purchasing outside food. One said: *“This MCO has a positive aspect to it. When it comes to food, we would think twice before purchasing something. We used to be able to buy whenever we wanted. However, we must consider if we have sufficient money to purchase something at this time. I start to distinguish between food that I eat for need or pleasure. Owing to long lines at restaurants, I often avoid fast food or outside food.”*

#### Less eating outside

A sixth subtheme emerged from study participants' responses pertained to eating outside. Specifically, these participants elaborated that some restaurant at their working place was closed or had limited operating hours that led them to less eating outside. *“I am working in the university campus area. Due to government orders, most of the canteens were closed at the time. We must either bring packed lunch from home or purchase a meal from a restaurant located outside of the campus.”* [Participant 033]. In the meantime, another respondent, Participant 028, claimed that he does not eat as much food as he used to. *“Previously, if we arrived home late from work, we might always find a restaurant open at midnight, but this is no longer the case nowadays.”*

### **3.3 Theme 3: Worsen in dietary management among Malay hypertensive patients during COVID-19**

In contrast, some of the participants (43%, 6/14) reported that this pandemic COVID-19 had worsened their diet habits due to: a) Poor food choices, b) Overeating, c) Buying outside food.

#### Poor food choices

Participant 025 stated that sometimes his poor food choices were influenced by family members. *“We bought outside food whenever requested by our children. My children occasionally enjoy sugar-sweetened drinks such as tapioca milk tea or boba milk tea. So, of course, I will join them in drinking.”* Moreover, he added that whenever they ate together, he had to finish all of the food if his kids did not, leading to overeating.

#### Overeating

Participant 016 reported, *“Staying at home made both me and my children hungry. Whenever they say they are hungry, I will cook whatever they want. Of course, I will eat together with them.”* She continued by saying, *“It is common when you stay at home for longer periods like this, we keep eating more than usual, right?”* as she indicated that her family always influences her. In addition, another participant, Participant 040, also mentioned that her dietary intake was uncontrolled since they are currently staying at home most of the time.

#### Buying outside food

Multiple participants stated that they would buy outside due to time constraints and work. Participant 015 highlighted that he and his wife were both working full-time from home and could not cook given the lack of time that required them to buy food from outside restaurants. Even if there are a small number of restaurants or far from their office, some participants must purchase outside food when working. Participant 028 stated: *“There are only a few restaurants open, and I'm still hesitant to eat outside. But I have to go to work as usual, so I have to eat my lunch outside.”*

Furthermore, the regulations had permitted dine-in at restaurants with social distancing measures after a few weeks of MCO. Following the SOP offered, some restaurants were allowed to reopen. As a result, some of the participants have begun to eat outside again or order food delivery.

## **4.0 Discussion**

Overall, the results highlighted divergent changes in their dietary practices. Notably, more than half of the participants reported an increased frequency of cooking at home. This outcome could be due to work-from-home instructions and restaurant restrictions and a fear of being infected when going out during the 'restriction of movement order' by the government (*Restriction of Movement Order*, 2020). This situation has increased individuals' opportunities to cook at home, allowing them to have greater control over the ingredients used in their meals.

Some respondents have reduced late-night eating or purchase food from outside. These changes can be attributed to either a willingness to improve one's diet or to a disruption of eating habits caused by the temporary closure of workplace restaurants and the

restriction of food premises' operating hours (hence reduced eating out). These results are consistent with previous research from other countries, which found improved diet quality during the lockdown in certain population subgroups (Alhusseini & Alqahtani, 2020; Giacalone et al., 2020; Miriam et al., 2020; Wang et al., 2021; Zielinska et al., 2020).

Previous findings revealed that the percentages of people who cooked by themselves, as well as wives who cooked, increased during the COVID-19 pandemic (Husain & Ashkanani, 2020). They also pointed out that the percentage of people who obtained their main meal from restaurants or consumed fast food was also reduced. The rise in home cooking could be related to attempts to occupy the increased free time resulting from the quarantines and an individual's desire to eat healthier in response to the COVID-19 spread.

Meanwhile, according to Xu et al. (2020), the COVID-19 pandemic impact, such as epidemic concern, the impact of psychology, the impact of work or study, has been associated with a higher score of willingness to adopt healthy dietary habits as they reported positive improvements to a proper diet. The researchers further asserted that the importance of changing features of diets should be considered in nutritional interventions for maintaining health and preventing and controlling COVID-19 during the pandemic period. Besides, in hypertensive patients' context, there are potential dietary patterns that could significantly impact the influence of their blood pressure control during the pandemic. The implementation of MCO may help reduce the intake of high salt foods such as takeaway and processed foods.

In contrast, it is notable in our study that a few unfavorable changes include poor food choices and overeating throughout the pandemic, which could arise because of spending more time at home and being influenced by other family members. These results are also in line with previous studies conducted in other countries (Deschasaux-Tanguy et al., 2021; Giacalone et al., 2020; Husain & Ashkanani, 2020; Radwan et al., 2020). Radwan et al. (2020) reported that the most prevalent unhealthy change in behavior among participants was increased in food intake, which could be contributed to by irregular eating patterns and frequent snacking. This situation is proposed as emotionally induced eating as it could be driven by feelings of fear, anxiety, anger, and stress during the confinement process. Similarly, another study conducted among the Danish population revealed an increase in emotional eating, which may result from the stress and boredom associated with the lockdown, which causes them to snack more frequently and consume more food during the lockdown period (Giacalone et al., 2020).

Furthermore, the results indicated that several participants reported the frequency of buying outside food during the COVID-19 pandemic due to time limitations, work burden, and access to delivery services. Although the majority of the respondents work from home, some maintain a work routine similar to when they are working in their workplace. Hence, they need to buy outside food due to their limited time to prepare their food. In Malaysia, online grocery shopping surged by 144% and online food delivery increased by 61% following the implementation of the MCO (Vodus Insight, 2021).

Finally, some of the participants displayed stable diet-related practices during the COVID-19 period. This "no change" cluster was represented by people claiming to "eat the same as usual," emphasizing their dietary routine as it was before the pandemic. This is most likely due to less disruption to lifestyle/environment during the pandemic or to those with well-established habits. The majority of people in this cluster work from home or partially work from home, and some are female. In previous study by Deschasaux-Tanguy et al. (2021), they displayed the same result of people who had no changes in their dietary routine during the lockdown, which is associated with older age, living in small cities or rural areas, and unchanged professional activity during the lockdown including individuals with no professional activity pre-lockdown (e.g.: unemployed, retired) or those who maintained their regular work outside the home (e.g.: essential sectors).

According to Laffin et al. (2021), there was a rise in blood pressure observed among US adults during the COVID-19 pandemic as compared to the pre-pandemic. Even though the present study revealed dietary changes, the outcome may have been more significant if there had been a comparison of biochemical data, such as blood pressure or a 24-hour urine sodium test, pre and during the pandemic.

## 5.0 Conclusion and Recommendations

In this study, we have explored for the first-time data on dietary management during the COVID-19 pandemic among Malay hypertensive patients. We found contradictory changes in dietary practices as a result of the pandemic situation. Corresponding to other reports of changes in dietary patterns during the lockdown, the findings of the study revealed improvement and worsening in dietary management, as well as no changes in some particular individuals. These different experiences could be associated with specific individual characteristics and their working status during this pandemic. As the COVID-19 is still spreading globally, which may have a lasting effect on lifestyle-related behavioral changes, this may have implications on the quality of health. Therefore, it is important to have an alternative solution to acquire knowledge during the pandemic, apart from relying solely on clinic appointments.

It is acknowledged that the present study has several limitations. The method of data collection (telephone interviews and online surveys) could have affected the overall findings, particularly given how telephone interviews are often discounted as compared to face-to-face interviews. As convenience sample was used in this study, the number of individuals who agreed to take part in the study could be one of the drawbacks. Additionally, the patients approached came from a single healthcare center due to social distancing measures and SOP implemented during the pandemic, making data collection in other healthcare settings difficult.

As the COVID-19 continues to spread in Malaysia and may have a long-lasting effect on lifestyle-related behavioral changes, additional research is necessary to have a better understanding of the mechanism underlying the reported nutrition-related changes. In addition, the current findings are consistent with changes reported in other national lockdown settings. This circumstance may help enlighten the public health authorities regarding the implications of the movement control order on the community, in which exceptional measures may be needed in the future. Considering the importance of nutrition in the management of chronic diseases and the immune response, unfavorable changes in diet should be monitored post-lockdown to prevent them from becoming established habits in the long run.

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