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Original Article

Consumers' Satisfaction with COVID19 Vaccination Services in Alexandria, Egypt

Fatema A. Badawy [1], Abdalla I. Shehata [2], Taghareed A. Elhoseeny [2¥]

1 Family Health Center, MOHP, Alexandria, Egypt
2 Department of Health Administration and Behavioural Sciences, High Institute of Public Health, Alexandria University, Egypt

Abstract

Background: Consumers' satisfaction is considered an attribute of quality of healthcare where its monitoring gives feedback on how appropriately as service is functioning. Positive consumer experience can be a key factor in the success of a mass vaccination program during a pandemic, with the goal of immunizing a significant proportion of the population.
Objective(s): to assess Coronavirus disease 2019 vaccination consumers' overall satisfaction with their experience and different process and organizational factors, as well as to find out suggestions for improvement.
Methods: a cross-sectional design was used. The study was conducted in four randomly selected primary health care (PHC) COVID19 vaccination centers using a predesigned structured interview questionnaire to collect data from 400 consumers between July and October 2022.
Results: The mean overall satisfaction score of the consumers with their vaccination experience was 7.8±1.58 out of 10. About 80% of consumers were willing to recommend the vaccine to others. Consumers were least satisfied with the presence of guiding signs about service steps (mean ± SD: 6.6±2.88), guidance of hotline team on the appropriate action to resolve problems related to vaccine (mean ± SD: 6.3±2.95), promptness of answer if you call hotline after any problem or side effect from the vaccine (mean ± SD: 6.2±2.47) and giving information about ministry of health hotline (mean ± SD: 3.2±3.72). The most common suggestion given by consumers was to improve the organization and decrease crowding (28.3%) followed by enhancing the hotline services (14.8%).
Conclusion: Most of the COVID19 vaccination consumers were satisfied with their vaccination experience and were willing to advise others to take the vaccine. The competence of providers, information given by attending staff about the vaccine, convenience of working hours and accessibility to vaccination centers were the highest rated by the consumers; while hotline services in terms of promptness of answer and guidance to resolve any issue related to the vaccine and the presence of guiding signs inside the vaccination centers had the least satisfaction. Respondents' most frequent recommendations were to improve the organization of PHC centers and decrease crowding followed by enhancing the hotline services.

Keywords: Satisfaction, consumer experience, COVID-19, vaccination, organizational factors

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¥***Correspondence***:
Email:
hiph.taghreedabbas@alexu.edu.eg

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INTRODUCTION

In health care services, consumers' satisfaction is an attribute of quality of care. Monitoring consumers' satisfaction gives feedback on how appropriately the service is functioning according to consumers' perception and what changes might be required to improve the service to meet consumers' expectations. This will in turn optimize the utilization of the provided service.(1) It is known that consumers' satisfaction process in health care services is a complex multidimensional concept in which many aspects influence consumers' perspectives. Those aspects include socio-demographic characteristics, expectations, health condition, consumer-provider relationship, facility settings, availability and accessibility.(2) In order to understand the determinants of health care consumers' experience and satisfaction, it is vital to consider the impact of both individual and organizational factors on consumers' perception of the care they receive.(3)

Sociodemographic characteristics of the consumer such as age, gender, educational level and perceived health status are important as they give vital information on how a consumer feels about different aspects of the service from his/her point of view based on social background and characteristics.(3) Organizational environmental factors as the presence of skilled workforce, the physical environment (e.g. waiting areas, cleanness), working hours and administrative issues when assessed from consumer point of view were found to influence the service

outcome and consumer experience.(4)

In late 2019 the world witnessed the appearance of coronavirus. Due to its high communicability and lack of population immunity, it has rapidly become a global threat and announced to be a pandemic in March 2020 by the World Health Organization (WHO).(5) Usually (COVID-19) symptoms are mild and include pyrexia, cough, severe headache, body aches and breathlessness. However, the disease may progress into severe pneumonia and multiple organ failure with high risk of morbidity and mortality rate, making it a serious public health problem.(6)

COVID19 mass vaccination campaign was a public health effective strategy to face this pandemic. The development and administration of vaccines against COVID19 was a key element in the fight against the pandemic, as it protected health systems and helped restore global economies.(7)

In the setting of mass vaccination programs against COVID19, it is important to pay attention to consumers' satisfaction. Assessment of consumer satisfaction with vaccination services during vaccination campaigns can help authorities to implement changes and close gaps as an attempt to meet the needs and expectations of the consumers.(8) Satisfaction assessment should identify components of the services that possibly need improvements. Analyzing perceptions of the consumers about immunization service delivery can identify the important determinants to work on.(9) The aim is to increase vaccination coverage so that COVID19 pandemic can be overcome and return back to normal life. Furthermore, consumers' satisfaction is a critical health care outcome indicator. Consumers who are satisfied with their care will recommend it to others, thus utilization and continuity are enhanced and vaccination coverage is promoted.(10)

So, the present research aims to assess COVID19 vaccination consumers' overall satisfaction with their experience and different process and organizational factors, as well as to find out suggestions for improvement.

METHODS

Study setting

The study was conducted at the Ministry of Health and Population primary health care (PHC) centers that were dedicated to COVID19 vaccination in Alexandria, Egypt. There were 51 centers at time of the study to cover the eight health districts in Alexandria.

Study design:

A cross-sectional design was followed in this study.

Target population:

Adult consumers aged 18 or above attending the MOHP COVID19 vaccination centers in Alexandria for the first, second or third dose of vaccination who agreed to participate in the study.

Sampling design

Sample size

Assuming that the expected level of satisfaction of the consumers with COVID19 vaccination services is 50%, using alpha error of 0.05 and margin of error 5 %, the minimum required sample size is 384 consumers, then it was rounded to 400. The sample size was calculated using Epi info-7 Software.(11)

Type of sample and method of selection:

Out of the eight health districts in Alexandria, four districts were selected by simple random sampling method. From each health district, one primary health care COVID19 vaccination center was randomly assigned by simple random sampling method. The predetermined sample was equally collected from the selected vaccination centers, in which 100 participants were enrolled from each vaccination center with a total of 400 consumers. Participants were recruited sequentially until completion of the sample size.

Data collection method and tool:

Data were collected over three months from July to October 2022 using a predesigned structured interview. A pre-coded interview schedule was developed by the researchers to gather the required data based on literature review. (12,13)

The questionnaire is composed of two sections: The first section included the socio-demographic characteristics of the participants including age, gender, marital status, educational level and occupation. The second section included thirty one questions. Questions from 1-8 measured satisfaction with the vaccination process. Questions from 9-29 measured satisfaction with the organizational factors. To assess global satisfaction, two questions were used. The first question asked the participants to rate their overall satisfaction with the COVID19 vaccination experience as a whole.(14) In response to these questions, consumers were asked to give value on a scale from one to ten using a visual analogue scale (VAS), where 1 is least satisfied and 10 is most satisfied and the mean score of satisfaction was calculated for each item. The second question to assess the global satisfaction was asking participants if they are willing to recommend the vaccine to others. Answers to this question were yes, no and I don't know.(14)

An open-ended question asked the participants to express their suggestions for improvement of the vaccination services. Face validity of the questionnaire was tested by four health administration professors. The reliability was assessed, and Cronbach's alpha was 0.809. A pilot study was conducted with 20 participants (not included in the statistical analysis) to

detect any vague questions. No modifications were needed. Completion of the interview did not exceed 15 minutes.

Ethical considerations:
Approval of the Ethics Committee of the High Institute of Public Health for conducting the research in March 2022 and that of the Ministry of Health and Population were obtained (Com. No./Dec.No:12-2022/13). An informed consent was obtained from all study participants after explanation of the purpose and benefits of the research and anonymity and confidentiality were assured and maintained.

Statistical analysis:
Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. **(**Armonk, NY: IBM Corp**,** released 2011). Qualitative data were described using number and percent. The Kruskal Wallis test was used to verify the normality of distribution. Quantitative data were described using mean and standard deviation (mean ±SD). Student t-test: for normally distributed quantitative variables, to compare between two studied groups. F-test (ANOVA): for normally distributed quantitative variables, to compare between more than two groups**.** Pearson correlation coefficient was used to examine the correlation between quantitative continuous variables.

RESULTS

Table 1 shows the distribution of COVID19 vaccination consumers according to socio-demographic characteristics and medical history. The average age of the respondents was 42±14.94 years. Nearly half of the participants (45.8%) belonged to the age group of more than thirty to fifty years old. More than half (62%) were females and about two thirds of the of participants (66.8%) were married.

The table also shows that the majority of participants (87.8%) received educational level of at least middle or high school education with only 12.2 % were either illiterate or received primary school education. More than half (53.5%) of the study group were unemployed.

Table 1: Distribution of COVID19 vaccine consumers according to socio-demographic characteristics (Alexandria, 2022)

Characteristics	Vaccine consumers (n=400) No.	%
Age		
18–30	101	25.2
>30 – 50	183	45.8
>50 – 70	100	25.0
>70	16	4.0
Mean ± SD.	42.0±14.94	
(Min. – Max.)	(18-79)	
Gender		
Male	152	38.0
Female	248	62.0
Marital status		
Married	267	66.8
Not married	133	33.2
Education		
Illiterate & primary	49	12.2
Preparatory & High school	172	43.0
University & Post graduate	179	44.8
Occupation		
Working	186	46.5
Not-working	214	53.5

SD: Standard deviation

Table 2 shows the distribution of COVID19 vaccine consumers according to their overall satisfaction with the whole vaccination experience and willingness to recommend vaccine. The majority of participants (80.2%) are willing to recommend others to take COVID19 vaccine. Moreover, the table shows that those who are satisfied are significantly more willing to recommend the vaccine than those who are dissatisfied or neutral. (F= 8.353, p=0.000).

Table 2: Distribution of COVID19 vaccine consumers according to their overall satisfaction with the whole vaccination experience and willingness to recommend the vaccine (Alexandria, 2022)

	Total (n=400) No.	%	overall satisfaction with the whole vaccination experience mean ± SD	F	p
Willingness to advise others to take the vaccine	.				
Yes	321	80.2	8.059±1.33		
No	48	12.0	7.23±1.342	8.353	0.000*
I don't know	31	7.8	7.73±1.37		

F: F for One way ANOVA test *: Statistically significant at $p \leq 0.05$

Table 3 shows distribution of consumers' overall satisfaction with whole vaccination experience and their sociodemographic characteristics. No significant association between the sociodemographic characteristics and the overall satisfaction with the vaccination experience was detected.

Table 3: Distribution of COVID19 vaccination consumers by sociodemographic characteristics and the means score of their overall satisfaction with the vaccination experience (Alexandria, 2022)

Characteristic		Overall satisfaction with the vaccination experience mean± SD
Age		
18–30		8.0 ± 1.66
>30 – 50		7.9 ± 1.50
>50 – 70		7.7 ± 1.66
>70		7.6 ± 1.45
	F (p)	**0.607 (0.611)**
Gender		
Male		8.0 ± 1.38
Female		7.8 ± 1.68
	t (p)	**0.719 (0.473)**
Marital status		
Married		7.9 ± 1.55
Others		7.9 ± 1.63
	t (p)	**0.093 (0.926)**
Education		
Illiterate & primary school		8.1 ± 1.21
Prep & high school		7.7 ± 1.66
University &post graduate		7.9 ± 1.58
	F (p)	**0.860 (0.424)**
Occupation		
Working		7.9 ± 1.63
Not-working		7.9 ± 1.53
	t (p)	**0.016 (0.987)**

SD: Standard deviation t: Student t-test
F: F for ANOVA test p: p value for comparing between the categories studied *: Statistically significant at $p \leq 0.05$

Table 4 shows the correlation between consumers' satisfaction with vaccination process and the mean score of overall satisfaction with the vaccination experience. The mean overall satisfaction score among 400 consumers regarding their whole vaccination experience was 7.8±1.58. Respondents were least satisfied with the ministry of health hotline (mean ± SD: 3.2±3.72). The correlation between consumers' level of satisfaction with most items of the vaccination process (5 out of 8 items) and the mean overall satisfaction of whole vaccination experience were statistically significant. However, it was weak to moderate with courtesy of service provider and allowing time to ask questions (r=0.315, p<0.001 and r=0.349, p<0.001 respectively) and it was very weak for the remaining 3 items.

Table 4: Correlation between mean scores of COVID19 consumers' satisfaction with the vaccination process and the overall satisfaction with the vaccination experience (Alexandria, 2022)

Vaccination process items	satisfaction score of vaccination process mean ± SD	Overall satisfaction score with vaccination experience mean ± SD	r	p
Information and advice given by doctor/nurse about the vaccine	9±2.55	7.8±1.58	0.010	0.842
Privacy during taking vaccine	8.8±1.50		0.148*	0.003*
Competence (proficiency) of the vaccine provider	9.4±1.05		0.151*	0.002*
Courtesy and friendliness of service provider to answer any questions about vaccine	8.5±1.38		0.315*	<0.001*
Explanation of possible side effects that may happen	7.7±2.69		0.186*	<0.001*
Giving information about ministry of health hotline	3.2±3.72		0.142	0.499
Allowing time to ask questions related to vaccine	8.2±1.65		0.349*	<0.001*
Informing you about the date of the 2nd dose during 1st dose taking	8.7±2.94		0.038	0.847

a footnote for this table: r: Pearson coefficient *: Statistically significant at $p \leq 0.05$

Table 5 shows the correlation between consumers' satisfaction with organizational factors and the mean overall satisfaction of the whole vaccination experience. The table shows that participants were least satisfied with the presence of guiding signs about service steps (mean ± SD: 6.6±2.88), guidance of hotline team on the appropriate action to resolve problems related to vaccine (mean ± SD: 6.3±2.95)

and promptness of answer if you call hotline after any problem or side effect from the vaccine (mean ± SD: 6.2±2.47). The correlation between consumers' level of satisfaction with almost all organizational factors (19 out of 21) and the mean score of the overall satisfaction of vaccination experience were statistically significant. However, it was only weak to moderate with ease of changing date or location of vaccination, promptness of answer of hotline services, guidance of hotline team on the appropriate action to resolve problems related to vaccine, courtesy of reception personnel, easiness of receiving vaccination certificate, counseling by reception personnel to complete vaccination consent, information given by reception personnel to complete registration process (r=0.492, 0.422, 0.391, 0.304, 0.289, 0.288 and 0.286 respectively) and it was very weak for the remaining 12 items.

Table 6 shows the suggestions provided by the COVID19 consumers to improve the vaccination services. Participants gave 16 suggestions to improve the service. The most frequent suggestion (28.5%) was to improve the organization and reduce crowding, followed by improving the hotline services (14.8%) and improving waiting areas (11.4%).

Table 5: Correlation between mean scores of COVID19 consumers' satisfaction with the organizational factors and the overall satisfaction with the vaccination experience (Alexandria, 2022)

Organizational factors	satisfaction score with organizational factors mean ± SD	Overall satisfaction score with vaccination experience mean ± SD	r	P
Easiness of accessibility to online registration link	8.8±1.44		0.125*	0.017*
Way of data presentation on website application	9.1±1.14		0.175*	0.001*
Easiness of application filling	9.1±1.08		0.187*	<0.001*
Time between registration & receiving the confirmation message (SMS) for the appointment	8.3±1.19		0.169*	0.001*
Ease of changing date or location of vaccination if needed (n=100)	7.6±2.33		0.492*	<0.001*
Proximity of vaccination center form home	8.1±2.07		0.165*	0.002*
Accessibility to vaccination center	9.2±1.49		0.073	0.143
Working hours in vaccination centers	9.4±1.16	**7.8±1.58**	0.142*	0.005*
Easiness of identification of vaccination place	8.5±1.42		0.204*	<0.001*
Presence of guiding signs about service steps	6.6±2.88		0.092	0.070
Information given by reception personnel to complete the registration process	8.2±1.74		0.286*	<0.001*
Courtesy of reception personnel	8.6±1.43		0.304*	<0.001*
Counseling -if needed- by reception personnel to complete vaccination consent	7.9±2.19		0.288*	<0.001*
Availability of suitable seats in the waiting area	8.1±2.02		0.246*	<0.001*
Cleanliness and ventilation of waiting area	8.9±1.71		0.201*	<0.001*
Presence of COVID19 educational materials	8.4±1.92		0.190*	<0.001*
Application of social distancing	7.3±2.20		0.152*	0.002*
Waiting time till having vaccine	8.5±1.60		0.204*	<0.001*
Receiving vaccination certificate	9.0±1.02		0.289*	<0.001*
Promptness of answer -if you call hotline- after any problem or side effect from the vaccine (n = 40)	6.2±2.47		0.422*	0.016*
Guidance of hotline team on the appropriate action to resolve problems related to vaccine (n = 40)	6.3±2.95		0.391*	0.027*

r: Pearson coefficient *: Statistically significant at $p \leq 0.05$

Table 6: Suggestions provided by COVID19 vaccine consumers to improve the vaccination services (Alexandria, 2022)

Suggested items	Vaccine consumers (n=81)	
	No.	%
Improve organization and reduce crowding	23	28.3
Improve hotline services	12	14.8
Improve waiting areas	9	11.4
Assigning places for elderly	4	4.9
Don't make vaccine obligatory	4	4.9
Providing vaccine centers nearer to consumers residency	4	4.9
Apply social distancing measures firmly	4	4.9
Improve staff dealing manner with consumers	4	4.9
improve the service in general	4	4.9
Increase privacy measures	3	3.7
Unifying the vaccine type through all doses	2	2.4
Provide more information about vaccine side effects	2	2.4
Decrease waiting time	2	2.4
Offer more time to ask questions	2	2.4
Give health education lecture about COVID19 vaccines	1	1.2
Improve MOHP vaccination website	1	1.2

DISCUSSION

The current study revealed that the mean score of the overall satisfaction for the whole vaccination experience among consumers was 7.8±1.58. This result is lower than other studies conducted in different countries. For example, the mean score of the overall satisfaction regarding COVID19 vaccination services was much higher in Spain (9.5±0.86) (14) and in Saudi Arabia (94.45±16.08: where a five points Likert scale was converted to numerical values in which 100 represented the highest possible satisfaction level and zero represented the lowest possible satisfaction level).(15) In addition, studies from Switzerland and India showed that participants total mean satisfaction score were 4.9±0.29(16) and 4.36±0.55 respectively (17) (with 1 denoting strongly disagree and 5 denoting strongly agree). This variation in the level of satisfaction may be related to a discrepancy in the quality of presented service as well as difference in the social norms and cultural believes among societies.(18)

In this study, 80.2% of participants were willing to recommend vaccines to others reflecting their good vaccination experience. This is higher than the result of a study conducted in Egypt in 2022 through a national based survey that found that half (50.2%) of vaccinated participants wouldn't recommend vaccination to others owing to overcrowding, lack of organization of vaccination process, complicated registration and inaccessible vaccination centers.(19) A significant relation between overall satisfaction with vaccination experience and willingness to recommend to others (p=0.000) was shown. A positive vaccination experience can aid to lessen fear and anxiety of getting vaccinated and by time can build trust toward the vaccine and increase vaccination coverage. Measuring global satisfaction is recommended as it is simple, easy to construct and provides the overall impression of the patient's experience. This is vital as multidimensional measures may miss important aspects that patients recognize distinct dimensions of care when forming an opinion about quality.(14)

Meanwhile, this study tried to find out which of the studies dimensions had a significant association to the overall satisfaction. This is as equally important as finding out which dimensions with the least satisfaction. These relationships can underline effective targets for improvement that consumers value most. Although no significant relationship between the consumers' overall satisfaction level of vaccination experience and any of their socio-demographic characteristics was found in this study, significant correlations were identified between satisfaction with most of the vaccination process items and the overall satisfaction with the whole vaccination experience. This can provide possible channels to enhance and promote vaccination coverage among the public by targeting these processes by the quality improvement projects. Generally, patients involvement through asking questions and expressing their concerns together with answering their inquiries may influence their health behavior.(20) Communication in vaccination settings should be two-way method where hearing patients voices and understanding their points of view may assist in building positive attitudes and builds trust.(21) Research showed a positive correlation between staff competence and service experience.(16,22) Similarly, orientation about side effects was found to be associated with better vaccine experience in New Zealand in 2023. Watching a short video after COVID19 vaccination that explained how vaccines function and the possible side effects decreased consumers' anxiety and raised intentions to get vaccinated again.(23) Regarding privacy, in

Switzerland in 2023 a study showed a significant relation between consumers' privacy perception and vaccination service experience($p<0.001$).(16)

In the present study, most of organizational factors had a statically significant correlation with the overall satisfaction with the vaccination experience. Receiving the vaccination paper-based certificate had a weak but significant correlation with consumers' overall satisfaction ($r=0.289$, $p<0.001$) vaccination certificates contain data about the given vaccine type, dosage and date that benefit consumers and public health authorities to guarantee the delivery of care and present official mandatory proof where presence of vaccination card is a must. This result is in agreement with a scoping review of 16 articles in 2023 which determined that the majority of the studies ensure a positive association between receiving vaccination certificate and better vaccination experience and higher rates COVID19 vaccination uptake driven by elements like employer, travel and other governmental influences.(24)

Regarding other organizational factors, consumers were satisfied with convenience of working hours in vaccination centers and satisfaction with this factor showed a positive correlation with the overall satisfaction of consumers with the vaccination experience ($r=0.142$, $p=0.005$)**.** Convenient working hours favor organizational accessibility. (25)

Participants were satisfied with the Web-Based scheduling application and easiness of filling of the application and registration and both showed a positive significant correlation with the vaccination experience($r=0.125$, $p=0.017$ and $r=0.175$, $p=0.001$ respectively) Similarly, the use of online booking website increased vaccine uptake and adherence to booster doses with recommendation to expand the use of E-health to be applicable to a broad range of preventative health activities.(26)

Similarly, participants were satisfied with the use of confirmation messages and communication through short messages service (SMS) and both showed a statistically significant correlation with the overall satisfaction with the vaccination experience ($r=0.184$, $p<0.001$). Sending text message provides a way to boost compliance and can be used more during immunization campaigns.(27)

Hotline services had the least rated organizational factor. However**,** a moderate positive correlation was found between hotline services satisfaction and the overall satisfaction with vaccination experience ($r=0.422$, $p=0.016$ and $r=0.391$, $p=0.027$ for both items respectively)**.** Hotline services have the capacity to provide information to public easily and fast. Now, it has become the responsibility of the health authorities to improve the use of technology and modern communication methods with the public in order to enhance their compliance with health initiatives.(28)

Participants were encouraged to express areas that need improvement in the service from their point of view. The most frequent comments (28%) were about better organization of consumers' flow in the vaccination centers and reducing crowding. In Egypt, nearly 6% of vaccinated participants mentioned that they are not willing to continue their vaccination dosage due to overcrowding and lack of organization.(19) Improvement of the hotline services came 2nd with 14% of the suggestions demanded rapid reply of calls and providing useful answers to the inquires of the participants. Healthcare services can benefit from hotline services. So, rigorous inspection of hotlines management requires skilled staff and appropriate resources for accurate and seamless control. The 3rd place was for improvement of the waiting areas (11% of the suggestions). Improving the layout and cleanness and ensuring the availability of seats and educational materials especially when large number of individuals have to be serviced at the same time is crucial hand in hand with effective infection control measures and safety precautions to maintain no harm and sound experience.

Limitations

The data was collected from primary health care vaccination facilities, still it was supposed to include additional vaccination sites as mega vaccination hubs and hospitals which may limit results generalization. A across sectional design was used which captures data at a focused time point, so it is difficult to ascertain causality between variables.

CONCLUSION

Most consumers were satisfied with their vaccination experience and were willing to advise others to take the vaccine. Consumers were mostly satisfied with the competence of providers, information given by them about the vaccine, convenience of working hours and accessibility to vaccination centers, and least satisfied with the hotline services in terms of promptness of answer and guidance to resolve any issues or side effects related to the vaccine and the presence of guiding signs inside the vaccination centers. Respondents' most frequent suggestions for improvement were to improve the organization of the centers and decrease crowding followed by enhancing the hotline services.

Recommendations

Improvement of hotline services is mandatory, especially the timeliness and speed of answer. Staff who communicate with the public should receive the appropriate training in the common vaccine problems and side effects as well as the good communication

practices. Appropriate and adequate signs should be available to orient the attendants with the steps and procedures of the vaccination process clearly. Consider proper organization of vaccination by choosing vaccination sites with sufficient space that ensure linear and steady patient flow to avoid overcrowding and to minimize queuing and waiting time.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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