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Predictors of physicians' practices related to nutritional counseling and management in Riyadh City

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Abstract *Background:* A growing interest has become increasing in the role of physicians as effective resources for the promotion of good nutritional practices, however, the factors that impede their nutritional counseling and management practice (NC&M) are not clearly understood in Saudi Arabia.

Objectives: The objectives of the study were to investigate physicians' practices concerning NC&M and to explore some determinants that predict such practices.

Results: Data of 266 physicians working in big hospitals in Riyadh showed that only 7.9% of the respondents reported that they were practicing all aspects of NC&M; including nutritional assessment, therapy, and education. Those who practiced any one of these aspects ranged between 13.9–40.2%, meanwhile, 28% frankly reported that they did not practice NC&M. In the last year, the mean percentage of patients placed on nutrition therapy was $24.15 \pm 27.78\%$ and the mean percentage of clinic time dedicated to NC&M was $21.49 \pm 20.54\%$. Most of the respondents (72.9%) had poor nutritional knowledge score. Overall, 19.2% previously attended CME in nutrition. Only 1.5% and 28.6% self-assessed themselves as “outstanding” and “good” in NC&M skills and the mean total self-efficacy in NC&M was moderate. The majority (77.8%) perceived NC&M as highly or moderately relevant to their specialties. Physicians attitude and perceived efficacy towards NC&M was moderately high as the mean scores were greater than their midpoint. Their perceived barriers of NC&M were considerably moderate; as the mean total score was found to

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be near the midpoint of that scale. Among the seven independent variables entered the binary logistic regression of physicians practice of NC&M, only the knowledge, attitude, and self-efficacy scores were significantly associated with their NC&M practice. These three predictors contributed by 23.5% of the variation of physician practice of NC&M.

Conclusions: Physicians knowledge, self-efficacy, attitudes and other factors should be stressed in any intervention warranted to improve their nutritional practices.

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1. Introduction

Since 1950s the link between diet and chronic diseases such as obesity, cancer, cardiovascular diseases, diabetes, gall stones has been increasingly well recognized worldwide.¹ Over the past three decades Saudi Arabia has witnessed a remarkable lifestyle changes towards urbanization with accompanying nutrition transition of its population where customary and traditional food is being replaced by fast food high in fat, sugar and salt. This is happening along with sedentary lifestyle and reduced physical activity.² Consequently, the prevalence and costs of health conditions associated with excess weight continue to rise in alarming rates.³ Therefore, efforts to treat and prevent these conditions have become increasingly important with a growing interest in the role of health service providers as resources for the promotion of good nutritional practices. Dietary and physical activity changes are needed not only to tackle poor and over nutrition but also to prevent and treat many of the chronic diseases that rise in epidemic proportions.⁴⁻⁶

Demonstrating the effectiveness of nutrition counseling is imperative, not only to promote successful patient outcomes but also to secure funding.⁵ Physicians are considered as the most credible source of medical information as well the best in their ability to motivate patients to make healthy lifestyle decisions.⁶ The credibility that physicians are typically accorded in many social settings suggests that nutrition advice delivered by practitioners may particularly persuasive. A study in Brazil demonstrated that trained health care providers were more likely to engage in nutrition counseling ($P < 0.013$) and to deliver more extensive advice ($P < 0.02$). They also used communication skills designed to improve rapport and ensure that clients understood the advice ($P < 0.01$).⁷

However, nutritional practice in hospitals has low priority.⁸ Previous surveys have shown that there is a disparity between physicians' beliefs about the importance of diet and nutrition in health maintenance and disease prevention and the actual delivery of nutrition counseling.⁹⁻¹² Warner et al.¹³ reported that physicians are better able to identify obesity and its associated health risks, but some negative stereotypical attitudes persist. Jay et al.¹⁴ found that more than 40% of physicians had a negative reaction towards obese patients, 56% felt qualified to treat obesity, and 46% felt successful in this realm. These negative attitudes affect current treatment practices and patient care. Doctors are reluctant to address weight management issues especially among those who are not extremely overweight.¹⁵ Physicians may not be also adequate role models for promoting healthy eating and exercise adherence.¹⁶

Published studies delineated many substantial constraints that prevent physicians from providing dietary counseling.

Physicians lack adequate time, knowledge, confidence (self-efficacy) and skills to provide effective nutritional counseling and management.¹⁷ Also a variety of characteristics of health service management such as lack of training, lack of incentives, heavy demand relative to personnel, the separation of preventive and curative services – all may impede the provision of sustained nutrition intervention.⁷

Despite the growing epidemic of obesity and overweight in Saudi Arabia, weight management is not adequately addressed and many of the above mentioned constraints can be observed to hinder adequate nutrition and exercise counseling and management. Al-Numair¹⁸ assessed nutritional knowledge of 59 primary health care physicians and reported that the mean mark of correctly answered questions was $51.7 \pm 14.35\%$. Moreover, there is a paucity of research tackling in depth physicians' nutritional counseling and management practice, attitudes, knowledge and beliefs. Understanding these perceptions will help identify continuous medical education (CME) training needs of physicians. This will guide tailoring an effective CME program about nutritional counseling and management that could be integrated into routine medical care.

Therefore, this study aimed to investigate physicians' practices concerning NC&M and to explore some determinants that predict such practices. Addressing such areas would help ensure strengthening the skills of physicians in providing quality counseling and therapeutic education for nutritional problems and weight maintenance with concomitant quality improvement across the health care delivery system in Saudi Arabia.

2. Methods

2.1. Study design and setting

A cross-sectional descriptive study was conducted in five big hospitals that represented different health institutions in Riyadh City, Saudi Arabia, during the period January through April 2010. Seven departments were randomly chosen from the prepared list of NC&M-related departments for each hospital (each hospital has its own classification for its departments). The chosen departments were providing care in different specialties including gastroenterology, cardiology, oncology, respiratory disorders, primary care, home care, diabetes center/clinic, obstetrics and gynecology and ophthalmology. Five hundred survey questionnaires were distributed to all physicians in those departments who were consented for their personal approval to participate in the study. Only those who agreed (307) were included in the study with response rate 61.4%. Forty one questionnaires were excluded due to incom-

plete answers, giving a final total of 266 valid responses. The study was approved by the research ethics committee at the author's institution.

2.2. Tool of the study

A self-administered structured questionnaire was developed. Its content validity was confirmed through an extensive literature review and experts specialized in clinical nutrition, public health and behavioral sciences. It included data about:

2.2.1. Personal data

This included data such as sex, years of experience, nationality, specialty.

2.2.2. CME data about NC&M

This included physicians' previous training, perceived needs of further training in NC&M, and preferred sources to get information about NC&M.

2.2.3. Perceived relevancy to specialty, benefits and utility, barriers of NC&M

This was measured in terms of a statement entailing the perceived relevancy of NC&M to their work, eight statements revealing to what extent physicians believe in their role (within their specialty) in promoting healthy nutrition, the utility and efficacy of NC&M, in addition to seven statements assessing their perceived barriers toward NC&M. All statements are stated as five points Likert scale where each statement was scored from 1 to 5 with higher score for strong or higher perception.

2.2.4. NC&M practices and some related factors

Five questions were used to reveal their NC&M practice, time devoted in NC&M, percentage of patients placed on nutritional therapy, issues discussed during NC&M, and different NC&M practices done during the visit. Also physicians were asked to self-assess their proficiency skills in NC&M.

2.2.5. Physicians' nutritional knowledge

This scale comprised 22 questions (five were multiple choice and 3 were true/false/don't know answers) that examined general and specific nutritional knowledge regarding healthy food, its constituents, food pyramid, glycemic index, caloric value, nutritional recommendations. For each question the correct answer was given a score of one and incorrect answer was given zero. Blank responses were coded as wrong responses. All scores were summed as a total knowledge score which ranged from 0 to 22. This score was leveled into three levels; *Poor* which is $\leq 50\%$ correct answers (0–11), *Fair* which is 51%– $< 75\%$ correct answers (11.1–16) and *Good* which is 75% or more correct answers (16.1–22).

2.2.6. Physicians' attitudes towards NC&M

A scale of 16 items was designed as five points Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) to ascertain physicians' attitude toward nutritional counseling and management. For each item, the response was scored from 1 to 5 with higher score for more favorable attitude toward NC&M. A total score was summed and ranged from 16 to 80).

2.2.7. Physicians' self-efficacy beliefs about NC&M

Self-efficacy means physician's confidence in his ability to participate in NC&M in common/difficult situations. The scale

used was designed after literature review and it was adapted from a published self-efficacy scale.¹⁹ It included 13 common/difficult situations to assess physicians' confidence in their ability to participate in NC&M (e.g., *Counseling patients in the benefits of dieting and weight management, Identifying barriers to compliance with dietary regime in a patient, Providing a patient with a detailed exercise prescription*). Each item was rated on a 10-point Likert scale ranging from 0 (not at all confident) to 10 (very confident). The total scale score can range from 0 to 130, with higher scores indicating stronger perceived self-efficacy in NC&M.

2.3. Statistical analysis

Data was processed and analyzed by SPSS, version 17. Descriptive statistics was used to describe the studied variables. For testing internal consistency of for the scales Cronbach reliability test was used and it was 0.95 for self-efficacy scale, 0.72 for attitude scale and 0.63 for knowledge scale. Binary logistic regression was used to determine the independent predictors of physicians' practice of NC&M which was the dependent variable in the regression. Practice of NC&M was assumed as (1) and non-practice of NC&M was the lower reference category (0). Seven independent continuous predictors were entered the regression which included the main psychosocial constructs of physicians practice; total knowledge score, total attitude score, total self-efficacy score, total barriers score, total benefits score, in addition to two main personal data; years of experience (which reflect age and experience), and hours of previous training in NC&M. The level of significance used was at P value < 0.05 .

3. Results

3.1. Respondents' demographics

Male physicians represent 53.8% of the respondents. Only 126 participants (47.4%) were Saudis, while only 36 physicians were non-Arabic speakers (13.5%). The mean years of experience of the respondents was 9.09 ± 6.8 years (range, 1–31 years). Half of the sample was working in Military hospitals, 45.5% were working in Ministry of health hospitals (General and Specialist) and 11.1% were from a university hospital. More than half of the respondents (56%) pursued postgraduate studies (fellowship; 30.5%, and others; 25.5%). One hundred and twelve respondents (42.1%) ranked in higher positions (such as consultants).

3.2. NC&M practice, skills and training among physicians

Table 1 shows that only 28.2% of the respondents did not practice NC&M. In the last year, the mean percentage of patients placed on nutrition therapy 24.15 ± 27.78 and the mean percentage of clinic time dedicated to NC&M was 21.49 ± 20.54 . Among those who were practicing NC&M, instructions (whether individual, group or handouts) were the most frequently mentioned practice (40.2%, 14.7%, 11.3%, respectively), while other aspects of NC&M; assessment and therapeutic plan were followed by only 13.9% and 15.4% of them. About the sort of nutritional advice given to patients, general information about healthy eating (52.3%)

Table 1 Physicians practice, skills and training of NC&M.

Variables	No (<i>n</i> = 266)	Percentage (%)
<i>Practice/time spent in NC&M involves:</i>		
–Not practicing NC&M	75	28.2
–Assessment	37	13.9
–Therapy	41	15.4
–Individual education	107	40.2
–Group education	39	14.7
–Handouts/others	39	14.7
–All	21	7.9
<i>Percentage of clinic time dedicated to NC&M [21.49 (20.54)]^a</i>		
≤40	64	24.1
20–	67	25.2
<20	90	33.8
Not applicable	45	16.9
<i>Percentage of patients placed on nutrition therapy [24.00 (000)]^a</i>		
≤40	64	24.1
20–	75	28.2
<20	61	22.9
0 & Not applicable	66	24.8
<i>Sort of nutritional advice usually given to patients</i>		
–No advice	34	12.0
–Disease specific	109	40.9
–General information about healthy eating	139	52.3
–Vitamin prescription	69	25.9
–Weight management	59	22.2
–Breast feeding	30	11.3
<i>Self-assessment of NC&M skills [2.02 (0.81)]^a</i>		
1. Unsatisfactory	77	28.9
2. Moderate	10	41.0
3. Good	76	28.6
4. Outstanding	4	1.5
<i>Resources used to get nutritional information:</i>		
Web based materials	105	39.5
Textbooks	123	46.2
Peer reviewed journals	46	17.3
Public magazines	61	22.9
Pamphlets	37	13.9
Others	18	6.7
<i>Previous training in NC&M</i>		
–Yes	51	19.2
–No	215	80.8

^a Mean (SD).

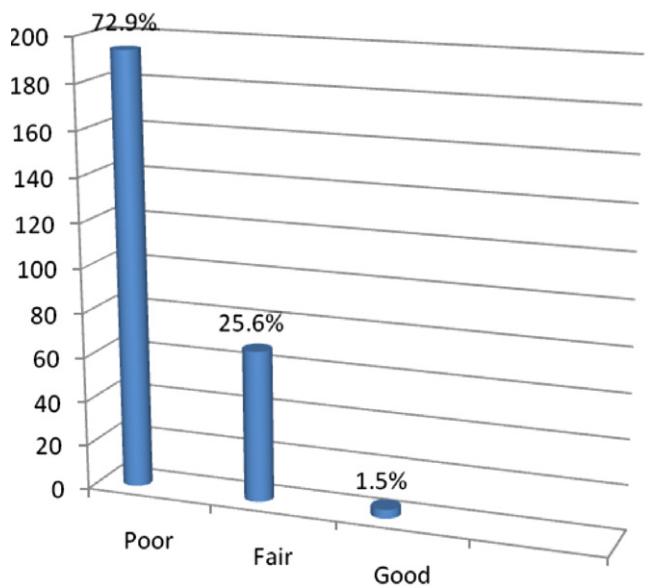
and disease specific instructions (40.9%) were cited on top of the list. Only 22.2% mentioned “dealing with weight management issues”. Overall, 51 respondents (19.2%) attended previously CME in nutrition. Only 1.5% and 28.6% of the respondents self-assessed themselves as “outstanding” and “good” in NC&M skills. The most frequently cited preferred sources of nutrition information were textbooks and Web (46.2% and 39.5%).

3.3. PHC physicians' knowledge, attitudes and perceptions about NC&M

Fig. 1 delineates that most of the respondents (72.9%) have poor total knowledge score about nutrition, 25.6% have fair knowledge level and only 1.5% have good knowledge level.

The mean total knowledge score was 8.76 ± 3.36 with the actual range (0–22) and the estimated range (0.5–17.8).

As shown in Table 2, the mean score of physicians' perceived relevancy of NC&M to their specialties (3.07) was moderately high as the range of the score was 1–4. Those who reported high perceived relevancy was (41%). Generally the physicians' attitude towards NC&M was moderately high. This is clear from values of the lower limit of total attitude score' range (35) and its mean (53.38 ± 7.34) where both were greater than the midpoint of that score (32.5). For different attitudinal statements, the mean scores of 11 out of 16 statements were above 3.35 (midpoint = 3, estimated range 1–5). However, the mean score of self-estimated physicians' perceived proficiency in NM & C (2.03) was less than the midpoint of the scale (2.5); this indicates that they acknowledge that they



■ Levels of Nutritional-related Knowledge among physicians

Figure 1 Percentage distribution of the physicians according to their knowledge levels.

are lacking the proficiency in NC&M. Again on the self-efficacy scale, the respondents' self-efficacy in NC&M was moderate as their mean total self-efficacy score was 77.51 which was around the midpoint (65) of the actual range (0–130). Along the self-efficacy scale of (0–10), all statements scored from 5.44 to 6.79 indicating moderate self-efficacy about different NC&M skills.

Concerning physicians' perceptions of benefits of NC&M, Table 2 indicates that the mean total perceived benefits score was high (32.49) which was a little bit near the maximum of the actual range of that score (8–40). On the other hand, their perceptions of the barriers that hinder the practice of NC&M were considerably moderate; as the mean total barriers score was found to be 25.61, which was slightly greater than midpoint (22.5) of the actual range (7–35). However, the most prominent barriers mentioned were lack of training, low priority given for nutrition management during physicians' preparation in their undergraduate study and shortage of physician time.

3.4. Binary logistic regression of PHC physicians' practice of NC&M with some independent variables

Table 3 indicates that among the seven independent variables entered the regression, only three predictors were found to

be significantly associated with physicians' practice of NC&M. These were the total knowledge score, the total attitude score, and the total self-efficacy score. Physicians with higher knowledge, attitude, and self-efficacy total scores were more prone to practice NC&M. If there is one unit increase in each of the knowledge, attitude and self-efficacy scores, we expect about 16%, 21% and 4% increase in the NC&M practice (odd ratio was 1.158, 1.205 and 1.036 with 95% CI of 1.033–1.297, 1.014–1.431 and 1.011–1.061, respectively). These three predictors contributed by 23.5% of physician practice of NC&M (Cox & Snell's R square = 0.235).

4. Discussion

Despite the potential for counseling to improve dietary practices, a broad review of literature suggests that the practice of NC&M among physicians is inadequate.^{20–22} The current study reveals similar findings where only 7.9% of the respondents reported that they were practicing all aspects of NC&M including nutritional assessment, therapy, and individual/group education. Some (13.9–40.2%) reported their practice to any one of the previously mentioned aspects, meanwhile, 28% frankly reported that they did not practice NC&M, and even 12% never gave any nutritional advice to their patients. The previously reported estimates of the percentage of patient consultations that include nutrition or weight counseling range from 14% to 50%.^{20–24}

Although the low prevalence of such counseling among physicians, it is clearly obvious in this study that most of them had favorable attitude to NC&M as The total attitude score was 53.38 and the scale's midpoint 32.5. Also, most of the respondents were aware of the relevancy of NC&M to their specialties (78.2%) and believed in the importance of nutrition in preventing and treating common diseases in Saudi Arabia (Mean = 32.49, range 8–40). This is in consistence to Kushner study (1995) who reported that nearly three quarters of respondents feel dietary counseling is important and is the responsibility of physicians.⁹ Kolasa and Rickett²⁵ mentioned that the gap remains between the proportion of patients who physicians believe would benefit from nutrition counseling and those who receive it from their primary care physician or are referred to dietitians and other healthcare professionals. Helman²⁶ concluded that the extent of nutrition counseling by GPs is considerably less than might be expected from the strength of their statements about the importance of nutrition and long-term health.

The reasons for the existing disparity between physicians' attitudes, beliefs about the importance of nutrition in health maintenance and disease prevention and the actual delivery of nutrition counseling and management is not clear. One rea-

Table 2 Physicians attitudes and perceptions regarding NC&M.

Scores of some determinants related to NC&M	Mean	SD	Observed range	Estimated range	Midpoint
Perceived relevancy to specialty	3.07	0.95	1–4	1–4	2.5
Perceived proficiency	2.03	0.82	1–4	1–4	2.5
Total perceived benefits	32.49	5.87	8–40	8–40	24.5
Total perceived barriers	25.61	4.33	9–35	7–35	22.5
Total attitude	53.38	7.34	35–76	16–80	32.5
Total self-efficacy	77.51	31.50	0–130	0–130	65

Table 3 Binary logistic regression of the NC&M practice among physicians with some independent variables.

Variables	B	S.E.	Sig.	Exp(B)	95% Confidence interval for EXP(B)	
					Lower	Upper
Total knowledge score	0.147	0.058	0.012	1.158	1.033	1.297
Total attitude score	0.186	0.088	0.034	1.205	1.014	1.431
Total self-efficacy score	0.035	0.012	0.004	1.036	1.011	1.061
Total barriers score	0.165	0.228	0.470	1.179	0.754	1.845
Total benefits score	-0.028	0.068	0.677	0.972	0.850	1.111
Years of experience	-0.098	0.166	0.554	0.907	0.655	1.255
Hours of previous training	-0.068	0.281	0.809	0.934	0.539	1.621
Constant	-7.183	2.027	0.000	0.001		

R^2 value 0.235.

SE = standard error, B = Beta.

son has been proven to exert a strong impact on human behavior and also on physician's practice behavior is self-efficacy.¹⁹ Those with greater degrees of self-efficacy are more likely to engage in the behavior and persist in the face of obstacles. When physicians lack the confidence in their ability to assess, counsel and manage nutritional issues, even when they believe in its importance, they might be more hesitant to do so.²⁷ Similar to the findings of Mihalynuk et al.,²⁷ our study shows that the total mean self-efficacy score of the physicians was quietly moderate (77.51 & range 0–130). Furthermore, physicians' self-perceived proficiency was also moderate; as fewer than one third of the physicians self-assessed themselves as outstanding and good (1.5% & 28.6%, respectively) in NC&M skills. Consistently, Vetter et al.²⁸ reported that less than one third of the participants were confident in their ability to assess the nutritional status of patients or to discuss general nutritional issues. This lack of confidence may have important consequences; according to a popular behavioral theory,¹⁹ Physicians who perceive themselves to be highly efficacious expect favorable outcomes.²⁹ Skilled physicians can serve as efficacy builders to their patients by diagnosing peoples' strengths and weaknesses and cultivating a patient's belief in their own capabilities. However, physicians fail to do so if they themselves do not feel competent at conducting basic nutrition assessments or offering dietary advice.^{30,31} Key physician factors found to be associated with low self-efficacy are lack of training, lack of knowledge, and perceived barriers.⁹ These factors might affect physicians' practices directly or indirectly through their self-efficacy.

A broad review of the literature suggests that the nutrition training of physicians and many medical students is inadequate; our data suggest that the majority of the respondents never received special training in NC&M (80.8%) and had poor nutrition knowledge (72.9%). This is also in keeping with a U.S. Public Health Service study noting that physicians are "woefully undertrained in nutrition".³² Also, Spener et al.³³ mentioned that the training received by medical students in their study did not adequately address the requisite skills for real patient encounters. Similar to our findings, the degree of nutrition knowledge has been found to be low among physicians in practice.³⁴ A 2002 survey of 290 medical students reported that some students were lacking in knowledge about NC&M knowledge.³⁵ Acquisition of knowledge and skills enable a person to meet personal standards of merit that tend to heighten beliefs of personal efficacy.³⁰ Physicians training

should not only focus on nutritional facts and knowledge but also should stresses on understanding of methods to improve a patient's nutrition status (e.g. ordering appropriate diets, referring patients to nutrition experts, providing a self-management prescription, among others). Bandura documented that influential mentors must be diagnosticians of peoples' potentials and must be knowledgeable about how to modify activities so that potentiality can be turned into actuality.³⁰

Lack of knowledge and training are perceived as barriers in the present study. Physicians noted many barriers to counseling their patients that agree with previous studies that reported lack of knowledge, lack of counseling training, low physician confidence, inadequate teaching materials in addition to a lack of time, inadequate reimbursement and patient non-compliance, as main barriers to diet counselling.^{36–38}

Our results implied that knowledge, attitude and self-efficacy were the most important significant predictors of physicians' practice of NC&M which came in accordance with previous researchers.^{39,40} Therefore, a multifaceted approach will be needed for training physicians to change their NC&M behavior. An effective training program should not only intend to increase their awareness and superficial knowledge of nutrition but also should involve discussion of in depth knowledge, development of attitudes, management skills and building a robust sense of self-efficacy to support the exercise of control in the face of difficulties that inevitably arise.⁴¹

Our study has several noteworthy limitations. Our results may have limited generalizability to other populations of physicians in KSA, as all respondents in our study were from big hospitals in Riyadh city and also the self-reported nature of the study carries the risk of disclosure bias, yet it represents the opinions of physicians from different specialties in big hospitals representing different health sectors all over the city. Because the selection of the sample was based on physician willingness and the response rate of less than 61.4% raises the possibility of a significant response bias among physicians responding to the survey. As we did not evaluate a sample of non-responders to examine differences between responders and those who did not respond, the possibility of non-response bias remains. Our results should be interpreted cautiously and may not apply to all community based physicians especially the primary care physicians were not included in the study. Test fatigue due to the length of the questionnaire may have led to lower overall scores. Despite these drawbacks, the prin-

cial strength of our study was that it was the first, to our knowledge, to investigate the predictors of physicians practice in NC&M in our country and it corroborated previous findings of significant deficits in knowledge, training, self-efficacy, with low scores in self-perceived proficiency and moderate scores of perceived barriers.

In conclusion the study recommends launching innovative and effective methods for enhancing physician training about nutrition, starting from medical school. Further research should be undertaken to explore other factors influencing NC&M, and to replicate the study on physicians with primary health care.

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