ARTICLE ORIGINAL / ORIGINAL ARTICLE

ASSESSING AND IMPROVING THE KNOWLEDGE DEFICIT ABOUT SALT REDUCTION
Effect of Salt Reduction Awareness on Lebanese Cardiac Subjects

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Dakhil Abboud H, Arnaout MS. Assessing and improving the knowledge deficit about salt reduction. Effect of salt reduction awareness on Lebanese cardiac subjects. J Med Liban 2016 ; 64 (4) : 187-192.

ABSTRACT • Objective : A high salt consumption was observed among the Lebanese population and the need to address this health behavioral problem was imperative. The aim of this behavioral intervention, part of the Lebanese Action for Salt and Health (LASH), was to assess the knowledge, behavior, and attitude of Lebanese patients' pre- and post-nutrition intervention in the Cardiac Care Unit (CCU) at AUB-MC. **Method:** 24 CCU patients (14 males; 10 females), from different age groups coming from various Lebanese regions were approached. A pre- and post-intervention questionnaire was filled to assess their baseline knowledge about salt and any knowledge gain attained after the teaching intervention. Instructive tools were prepared and used such as presentations, pamphlets, posters, shopping guides, and a video dedicated to the campaign. Moreover, this awareness intervention extended to include a total of 49 nurses, food service employees, and diet aid personnel who attended a session about the importance of salt reduction on health. **Results:** Participants were aware of the relationship between salt intake and health; however, lack of knowledge was observed concerning the salt content of different food items, the importance of food labels, and the knowledge about the maximum recommended daily allowance of salt intake among other knowledge needs. A tremendous improvement was perceived post teaching intervention. **Conclusion:** This behavioral intervention has gained numerous positive feedbacks and was extremely useful for patients. It undoubtedly served as a knowledge refresher for various nurses and medical staff alike. The success of this intervention encourage conducting a similar activity on all the hospital floors to ensure improvement in nutritional knowledge and adoption of healthy diets for optimal lifestyle.

Keywords : salt, sodium, behavioral intervention, dietary intervention, salt reduction activity

Dakhil Abboud H, Arnaout M.S. Évaluer et améliorer le déficit de connaissances sur la réduction du sel. L'effet de la sensibilisation à la réduction du sel sur des sujets cardiaques libanais. J Med Liban 2016 ; 64 (4) : 187-192.

RÉSUMÉ • Objectif : Une consommation élevée de sel a été observée chez la population libanaise. La nécessité d'aborder ce problème de comportement de santé était impératif. Le but de cette intervention, un des projets de l'Action libanaise pour sel et santé (*Lebanese Action for Salt and Heath* - LASH), était d'évaluer les connaissances, le comportement et l'attitude des patients libanais avant et après une intervention nutritionnelle dans l'unité de soins cardiaques (CCU) au centre hospitalier de l'Université américaine. **Méthode:** 24 patients (14 hommes; 10 femmes), de différents groupes d'âge provenant de diverses régions libanaises ont été approchés. Un questionnaire pré- et post-intervention, a été rempli pour évaluer leurs connaissances de base sur le sel et tout gain acquis suite à l'intervention nutritionnelle. Plusieurs outils instructifs ont été préparés et utilisés tels que présentations, brochures, affiches, guides d'achats et une vidéo consacrée à la campagne. Cette intervention de sensibilisation a également inclus 49 membres du personnel hospitalier issus des services infirmiers, nutritionnels et conseils en régime alimentaire. Ces derniers ont assisté à une session sur l'importance de la réduction du sel en matière de santé. **Résultats:** Les participants étaient au courant de la corrélation entre la consommation de sel et la santé. Cependant, un manque de connaissances a été observé concernant la teneur en sel des différents produits alimentaires, l'importance des étiquettes alimentaires et la connaissance de la dose quotidienne maximale de sel recommandée. Une amélioration considérable a été perçue après l'intervention nutritionnelle. **Conclusion:** Cette intervention comportementale a été positive et extrêmement utile pour les patients et les employés. Le succès de cette intervention encourage la réalisation d'une activité similaire à tous les étages de l'hôpital pour assurer un progrès dans la connaissance nutritionnelle et l'adoption d'une alimentation saine pour un mode de vie optimal.

BACKGROUND

According to the World Health Organization (WHO), the prevalence of hypertension in the Eastern Mediterranean Region is 29% [1,2]. On the other hand, rates of hypertension in Lebanon are estimated to be 39% while excessive dietary salt intake accounts for 30% of this prevalence [3]. In fact, numerous studies accentuate the association between high sodium intake and increased prevalence of higher blood pressure and thus have been linked to cardiovascular diseases [4, 5, 6]. Essentially, raised blood pressure is a major cause for cardiovascular diseases, responsible for 62% of stroke and 49% of coronary heart diseases [7]. A recent study from the American University of Beirut Medical Center (AUB-MC) and the Faculty of Agricultural and Food Sciences indicated that major sources of salt in the Lebanese diet are from two staple foods [3]. The study demonstrates

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that bread and dough-based foods constitute 25% of Lebanese people's sodium consumption while Lebanese thyme *manaeesh* or "pizzas" constitute 4% [3]. As for other developing countries, the main sources of sodium consumed (around 70%) come from table salt, salt added during cooking or from sauces [6,7,8]. Moreover, processed and prepared foods that have unclear and misleading nutritional labeling contribute to most of the sodium consumed by the general population [9]. In most developed countries, around 75 to 80% of salt is hidden in the processed foods, especially the salt added by the food industry [6,7,10].

Sodium is an important element that is needed for regulation of blood pressure, blood volume, pH, and osmotic equilibrium [9]. Nevertheless, consuming excess amounts of salt (dietary sodium) causes fluid retention and subsequent increase in blood pressure [9,11]. Not only does high intake of sodium contribute to hypertension, but it can also lead to renal disease, left ventricular hypertrophy, osteoporosis, stroke, heart failure, stomach cancer, and cardiovascular diseases [11,12].

Decreasing salt consumption has many evidence-based health benefits [3]. The Canadian Stroke Network estimates that a sodium intake less than 1500 milligrams per day would decrease the incidence of hypertension by 30% [9]. The WHO/FAO, on the other hand, presently recommends an intake of no more than 5 grams of salt per day (2 grams or 87 mmol of sodium) [13,14].

Nevertheless, the study showed that most Lebanese people surpass the recommended salt intake and 70% of the average sodium intake is from cured meats, cheeses, and processed breads [3]. And the average salt intake in most countries of the world is almost 9 to 12 grams per day, with many Asian countries having mean intakes more than 12 grams daily [15].

All the above-mentioned reasons indicate the need for raising awareness about the risks of high salt consumption and its sources in the diet. There has been a world movement started by World Action on Salt and Health (WASH) [15]. In fact, in 2005, WASH was founded with a mission to enhance populations' health worldwide by attaining a progressive decrease in salt consumption [15, 16]. WASH motivates multinational food companies to decrease salt in their commodities. WASH also works with various countries' governments shedding light on the need for a salt reduction strategy that targets all the population [16]. WASH aims at decreasing salt consumption worldwide to reach WHO's recommendation of 5 grams salt per day by decreasing the quantity of salt in processed foods in addition to salt added while cooking and/or at the table [15, 16]. Until now, WASH has 527 members from 95 countries [16].

AUBMC's recent Vascular Medicine Program in collaboration with the Lebanon Action for Salt and Health (LASH) are working in the same path as WASH [3]. The goal of LASH is to optimize the salt intake of the Lebanese population by developing a national strategy that spreads awareness about the adverse consequences of high salt intake, helps Lebanese people change their behavior, advocates for product regulation and reformulation to establish a "low-salt environment", and creates a national system for salt monitoring and evaluation [3].

Eventually, a national engagement in a salt reduction action will result in major improvement in public health in general and health-related cost savings in particular [7].

OBJECTIVE

Based on the evidence in the literature and due to the high consumption of salt among the Lebanese population, we acknowledged the need to address this problem and raise awareness about the health risks of a high salt/sodium diet, the sources of sodium in the diet and tips on how to decrease its consumption. The objective of this action as part of the LASH was to reflect the knowledge, behavior and attitude of Lebanese patients' pre- and post-nutrition intervention in the Cardiac Care Unit (CCU) at AUBMC.

DESIGN

Subjects

The targeted population in the CCU was a total of 26 admitted patients. However, one patient refused to participate and the other patient was intubated, therefore a total of 24 participants took part in this interventional awareness campaign. Most of the patients who participated in our campaign were 50 years old or above. And most of them carried at least a school degree.

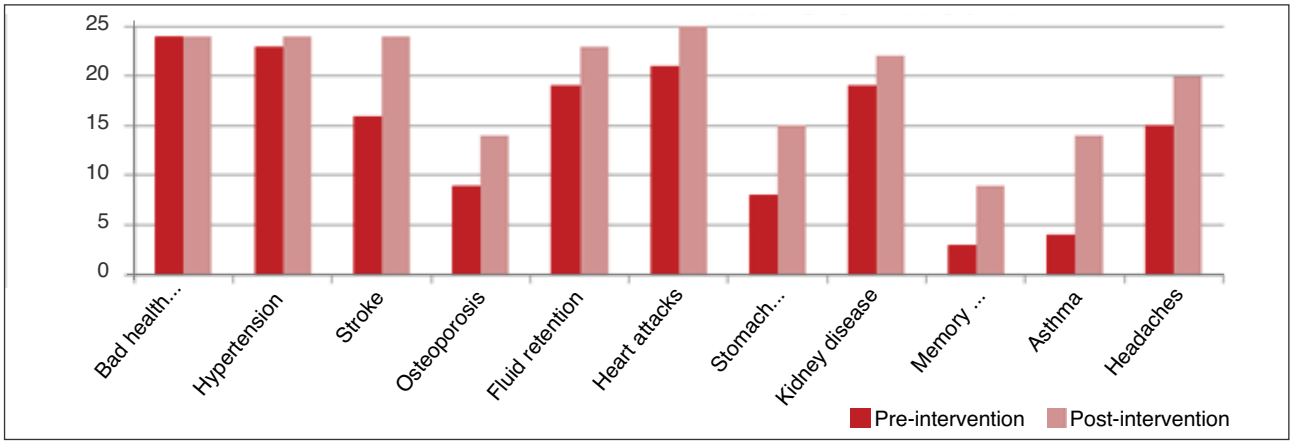

FIGURE 1. Impact of hight salt intake on health

Method

This campaign was able to reach a wide and variable audience in a week. Twenty-nine admitted cardiac patients were targeted, with their caretakers and the nurses working in CCU. A pre- and post-intervention questionnaire was filled by 24 subjects to assess their baseline knowledge about salt and its improvement after the teaching intervention. Indeed, many instructive tools were prepared and used such as power point presentations, pamphlets, posters, shopping guides, drawings, stickers, ribbons, slogans and a video dedicated to the campaign. Moreover, a total of 49 CCU nurses, food service employees and diet aid personnel were as well part of this awareness action by attending a session about the importance of salt reduction on health and being part of this whole action.

RESULTS

Participants were mostly aware of the relationship between salt and bad health effects, hypertension, fluid retention, heart attacks, kidney disease and headaches both pre- and post-intervention (Figure 1). Even though misconceptions regarding the overall effects on salt intake on health were corrected during our intervention, knowledge regarding the relationship between salt intake and osteoporosis, stomach cancer, memory problems and asthma still remained low. This is possibly due to the fact that the participants associate salt solely with heart problems and kidney disease. With regards to the salt content of different foods (Figure 2), there were also misconceptions.

In the pre-intervention phase, only 21% knew that bread was high in salt and 83% knew in the post-intervention interview. Bread is consumed with almost every meal and the participants do not consider it a source of salt, compared to *manaeesh*, cheese, French fries, soy sauce, salad dressing and roasted nuts which they knew were high in salt. In the post-intervention of salt content of different foods, more than 83% of the participants were aware and knowledgeable of the different sources of salt. When participants were asked if they were concerned with the food content (Figure 3), salt/sodium was

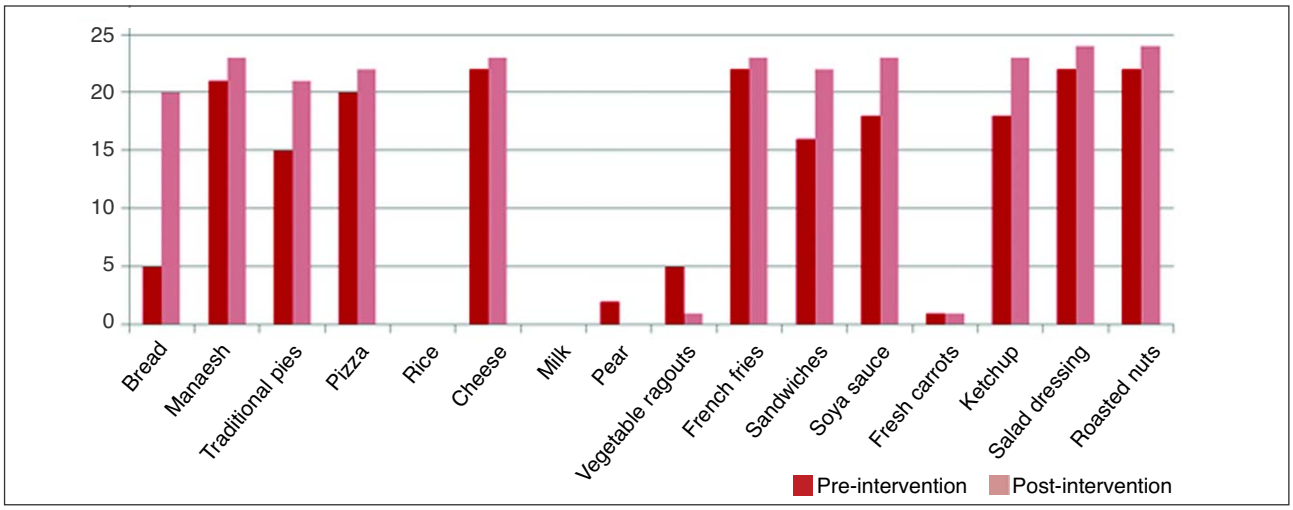

FIGURE 2. High salt food items

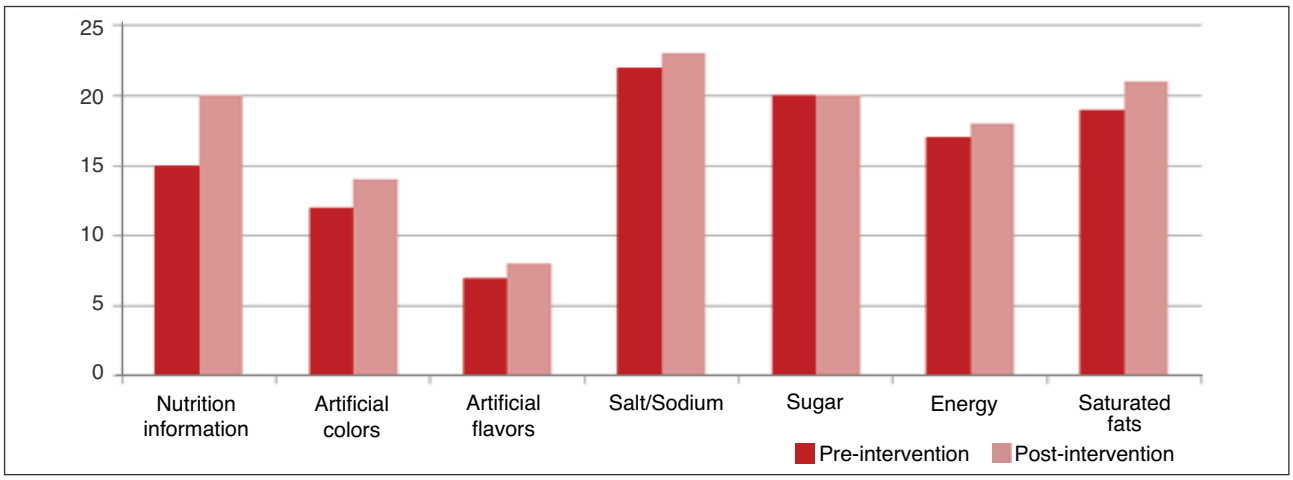

FIGURE 3. Concerns over food content

the ingredient that was most important to them, reaching 96% post-intervention. Saturated fats, energy and sugar were their second concern(s) after salt/sodium, as reflected by the pre- and post-intervention results. Artificial colors and flavors were of least concern, as there was a slight increase from the pre- and post-intervention. As for the nutrition information on sodium, 63% found it difficult to comprehend how post-intervention results increased to 83%.

Moving towards behavioral changes that occur while shopping for foods, 50% of the participants reported to look at food labels and 58% answered that salt content of food affected their purchase. However, after the intervention, the numbers increased to 79% and 83% respectively.

The participants (more than 65%) were aware of the importance of buying "low salt" and "no added salt" and the numbers increased to 88% after our nutrition intervention.

Sixty-six percent of the participants were already cutting down on salt; however, after the nutrition intervention and education took place, 92% of the patients reported to be reducing their salt intake. In addition, there was also a decrease in participants adding salt during cooking and a salt shaker on the table after our intervention (Figure 4).

As for the reasons of salt reduction (Figure 5), in the pre-intervention phase, 84% of the participants reported to reduce their salt intake due to health problems. This response along with lowering blood pressure, reducing risks of heart problems and eating healthier were the most reported answers after our intervention. This is due to the fact that these patients were aware that salt is among the elements affecting their health since they were in the CCU ward, where their diet orders are mainly "sodium restricted" or" no added salt" making them more knowledgeable on reducing salt.

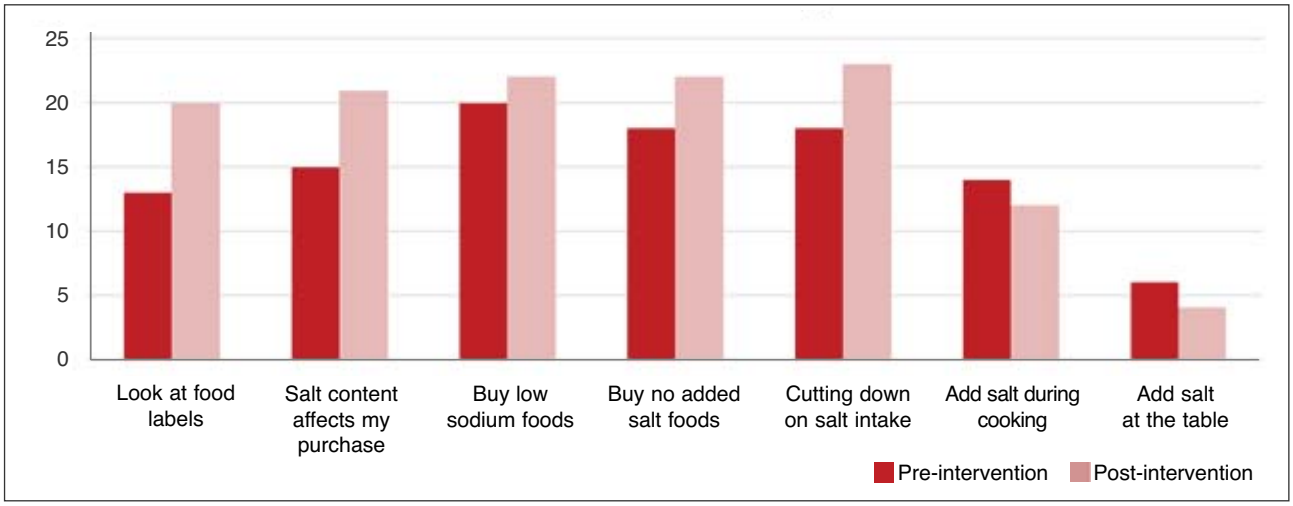

Figure 4. Behavorial change

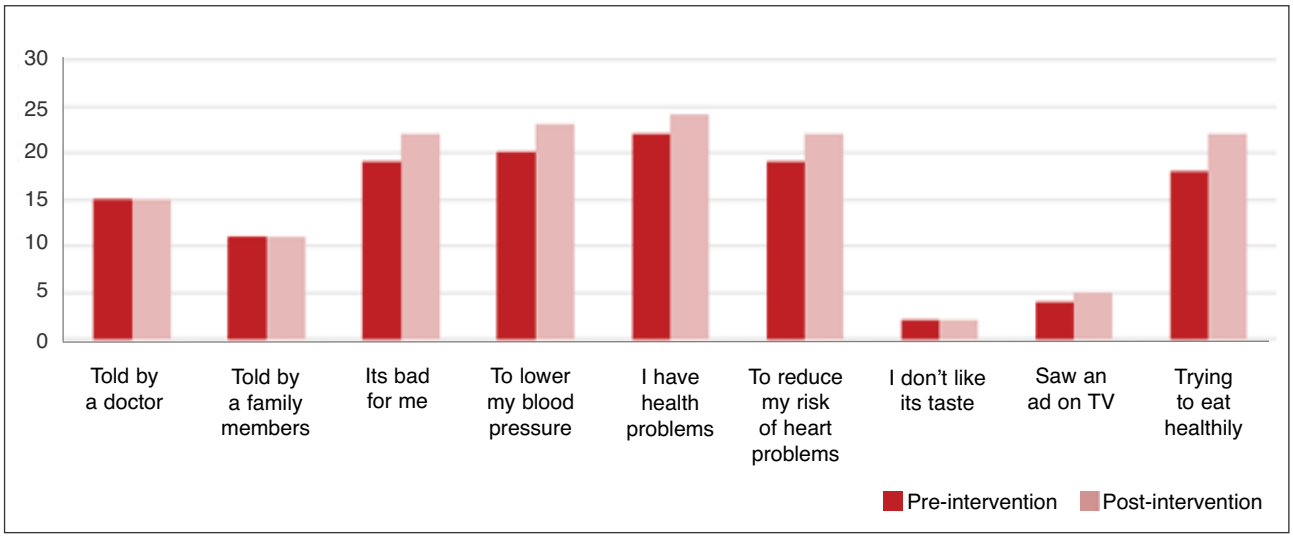

Figure 5. Reasons for salt reduction

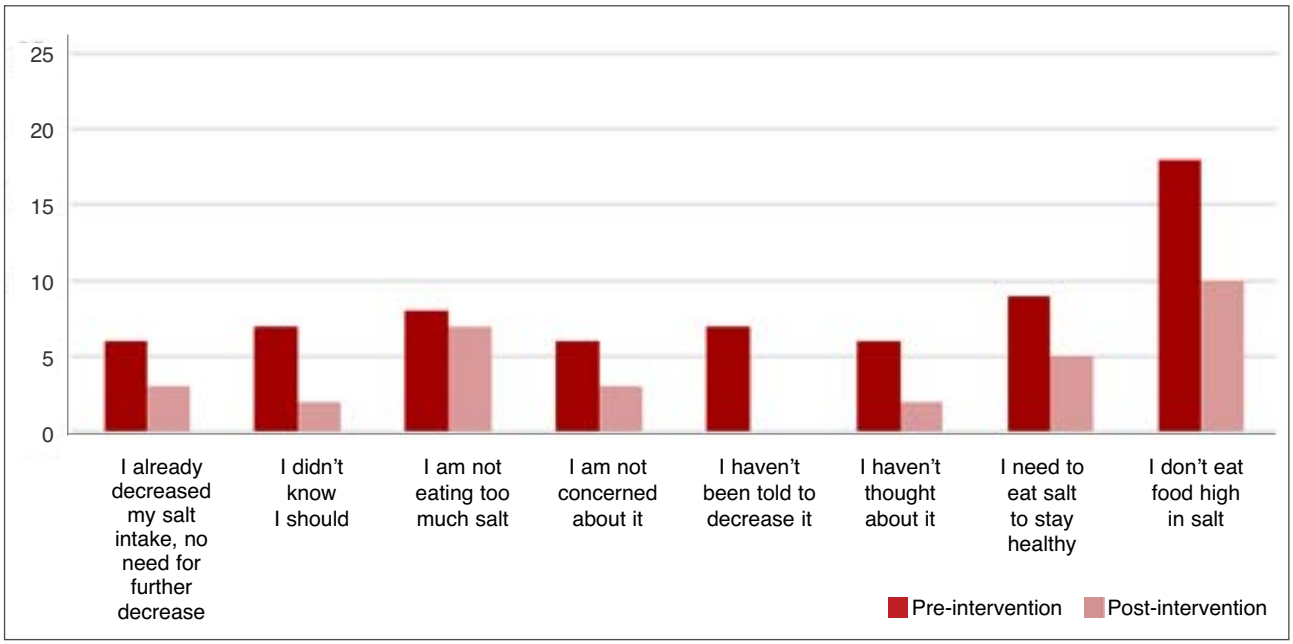

FIGURE 6. Barriers for salt reduction

When asked on the barriers for reducing salt, 71% of the participants answered that they do not consume foods high in salt. As observed in the graph (Figure 6) results post-intervention reflected an increase in the participants' awareness regarding salt intake, and misconceptions were corrected.

LIMITATIONS, CONCLUSION & RECOMMENDATIONS

This awareness campaign for salt reduction as part of the LASH shows that an educational intervention using attractive teaching tools is effectively beneficial for the cardiac population filling a gap in their knowledge related to salt. A remarkable improvement in knowledge and beliefs concerning salt was observed among this sample of Lebanese subjects.

These results must be confirmed by another study with a larger number of patients.

Finally, as part of LASH series of activities, this activity per se helped a small sample of subjects but can be an example to follow in other healthcare centers in order to increase awareness nationwide, influence positively public health and ameliorate the health-related cost savings on the long-term.

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REFERENCES

1. World Health Organization. Regional Office for Eastern Mediterranean (EMRO). 2010. Retrieved from http://www.emro.who.int/data-and-statistics.html
2. Strazzullo P, Cairella G, Campanozzi A et al. Population-based strategy for dietary salt intake reduction: Italian initiatives in the European framework. Nutrition, Metabolism and Cardiovascular Diseases 2012; 22: 161-6.
3. Ohstrom L. AUB study: Staple Lebanese breakfast foods high in sodium. 2013. Retrieved from: http://search.proquest.com/docview/1285206185?accountid=8555
4. Hendriksen MAH, Hoogenveen RT, Hoekstra J, Geleijnse JM, Boshuizen HC, Van Raaij JMA. Potential effect of salt reduction in processed foods on health. American Journal of Clinical Nutrition 2014; 99: 446-53.
5. He FJ, Li J, MacGregor GA. Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomized trials. BMJ 2013; 346: f1325.
6. He FJ, Campbell NRC, MacGregor GA. Reducing salt intake to prevent hypertension and cardiovascular dis-

ease. Revista Panamericana de Salud Publica 2012; 32 (4): 293-300.
7. He FJ, MacGregor GA. Reducing population salt intake worldwide: from evidence to implementation. Progress in Cardiovascular Diseases 2010; 52: 363-82.
8. Batcagan-Abueg AP, Lee JJ, Chan P, Rebello SA, Amarra MS. Salt intakes and salt reduction initiatives in Southeast Asia: a review. Asia Pacific Journal of Clinical Nutrition 2013; 22 (4): 490-504.
9. Turlova E, Feng Z. Dietary salt intake and stroke. Acta Pharmacologica Sinica 2013; 34 (1): 8-9.
10. Brown IJ, Tzoulaki I, Candeias V, Elliott P. Salt intakes around the world: implications for public health. International Journal of Epidemiology 2009; 38: 791-813.
11. He FJ, Burnier M, MacGregor GA. Nutrition in cardiovascular disease: salt in hypertension and heart failure. European Heart Journal 2011; 32: 3073-80.
12. Alkhunaizi AM, Al Jis HA, Al Sadah ZA. Salt intake in eastern Saudi Arabia/Apport en sel dans l'est de l'Arabie saoudite. Eastern Mediterranean Health Journal 2013; 19 (11): 915-918. Retrieved from http://search.proquest.com/docview/1492863967?accountid=8555
13. World Health Organization. Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO Expert Consultation. Geneva: World Health Organization. WHO Technical Report Series 2003; 916.
14. WHO. Reducing salt intake in populations. Report of a WHO Forum and Technical Meeting, 5-7 October 2006. Paris: WHO 2007.
15. He FJ, Jenner KH, MacGregor GA. WASH-World Action on Salt and Health. Kidney International 2010; 78: 745-53.
16. World Action on Salt & Health - University of London. 2014. Retrieved from: http://www.worldactiononsalt.com/about/index.html