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Community Interventions for Health (CIH) can support clinicians in advising patients to reduce tobacco use, improve dietary intake and increase physical activity

ABSTRACT

Aims and objectives
To increase clinical interventions to reduce modifiable risk factors for non-communicable disease in low and middle-income countries

Background
Non-communicable disease is the leading cause of death in the world and is common in low and middle-income countries. Risk factors for non-communicable disease are modifiable and health professionals are in an unique position to intervene and influence them.

Design
Clinical interventions were utilized as part of the Community Interventions for Health programme, a non-randomised, controlled study undertaken in three communities – one each in China, India and Mexico.

Methods
All clinicians in intervention and control areas of the study were invited to complete surveys. 2280 completed surveys at baseline and 2501 at follow-up. Culturally appropriate interventions to reduce tobacco use, improve dietary intake and increase physical activity were delivered in the intervention areas.

Results
Clinicians in the intervention group felt more prepared to advise smoking cessation and improvement of diet. They were more likely to test serum cholesterol and blood pressure but less likely to take measurements of height, hip, waist and skinfold thickness. There were more resources available to clinicians in the intervention group and they used counselling more and complementary medicine less than those in the control group.

Conclusions
Community interventions which have been shown to have a positive effect in the community and workplace also change clinical practice.

Relevance to clinical practice
Community interventions make clinicians, including nurses, more likely to feel prepared to offer advice and more likely to use counselling. This would be expected to reduce risk factors in patients.

Keywords
Tobacco, smoking, physical activity, nutrition, obesity, nursing

WHAT DOES THIS PAPER CONTRIBUTE TO THE WIDER GLOBAL CLINICAL COMMUNITY?'

- **Relevance:** Non-communicable disease (NCD) is responsible for nearly 70% of deaths globally and is associated with four main modifiable risk factors; tobacco use, unhealthy diet, harmful use of alcohol and physical inactivity. Physicians and other

health professionals are in an unique position to offer advice to reduce the risk of NCD

- **Response:** The Community Interventions for Health programme (CIH) took place in selected communities in China, India and Mexico and was designed to increase:
  - Discussion about the risk factors for NCD
  - Tests and measurements of risk factors
  - Advice and treatment for smoking cessation, weight loss and increased physical activity
  - Availability of interventions
- **Results:** Health professionals felt more prepared to advise smoking cessation and improved dietary intake, they tested serum cholesterol and blood pressure more frequently and increased use of resources to address NCD risk factors.

INTRODUCTION

Non-communicable disease (NCD), including cardiovascular disease, diabetes, chronic lung disease and cancer, is the leading cause of death in the world (Lozano et al. 2012). Although NCD is usually regarded as a disease of affluence, more than 80% of the mortality attributed to NCD occurs in low and middle-income countries (LMIC) and 30% of these deaths are premature and preventable (World Health Organization 2015). NCD is associated with four main behavioural risk factors; tobacco use, physical inactivity, unhealthy diet and harmful use of alcohol. All these risk factors are modifiable and present an opportunity to reduce the impact of NCD. Health professionals are in an unique position to intervene and influence the risk of NCD in their day-to-day work.

BACKGROUND

The majority of published work addresses tobacco cessation. Advice from physicians has been reported to affect tobacco cessation positively (Stead et al. 2013). Evidence from the 1980s demonstrated that advice from physicians facilitated smoking cessation, but there was low detection of smokers then and only a few received advice (Stead et al. 2013). Use of pharmacotherapies increased the success rate of cessation attempts and counselling and other interventions, such as motivational interviewing, have been proposed as effective methods (Stead et al. 2013). There was little difference between minimal advice and more intensive interventions such as use of several consultations and additional materials (Stead et al. 2013). In particular, the number of follow-up visits to the doctor had minimal effect nor did aids such as demonstration of expired carbon monoxide (Stead et al. 2013). Longer counselling sessions showed no significant benefit when compared with shorter (ten minutes or less) sessions, although this result was based on a single study (Stead et al. 2013). Overall it has been estimated that brief advice offered by physicians increased cessation rates from a baseline of approximately 2% by a further 1-3% (Stead et al. 2013). As 80% of the population visit a physician annually there is great opportunity to reduce smoking by simple advice from a physician. Pharmacotherapy increased cessation rates by 1.5 to 2.5 fold (Stead et al. 2013) thus offering both advice and pharmacotherapy is clearly sensible.

Nurses are a larger clinician group than physicians and there is strong evidence that advice offered by nurses, especially in hospital settings, increased cessation attempts (Rice et al. 2013). Advice offered in health centres, while less effective, probably has some impact. Similar results were found in nursing compared with physician consultations, as single sessions lasting no more than ten minutes were as effective as more intensive interventions. Additional resources, including written materials and carbon monoxide monitoring showed no additional effect, nor did additional clinic sessions or telephone support. However, there is evidence that nurses who integrated smoking cessation within other duties were less effective than those with a specific health promotion role (Rice et al. 2013).

There are few studies exploring clinicians' impact on improving dietary intake and increasing physical activity. A systematic review and meta-analysis of interventions to improve diet showed dietary advice decreased cardiovascular risk by lowering both blood pressure and low density lipoprotein (Hartley et al. 2013). The authors concluded that advice to increase fruit and vegetables had favourable effects on cardiovascular disease risk factors.

A systematic review of programmes to reduce weight using diet and/or exercise (Johns et al. 2014) has shown diet alone is not significantly different from diet combined with physical activity at three months follow-up, but at twelve months the combined programmes showed superior weight loss. Increases in body mass index (BMI) are associated with an increased risk of type 2 diabetes, cardiovascular disease and some cancers. Studies have shown that weight loss alone in overweight or obese people is beneficial. However, there are additional benefits derived from physical activity in cardiovascular disease, where studies have shown that increased steps per week in combined programmes reduce risk more than diet or physical activity alone (Johns et al. 2014) – again demonstrating a synergy between components of public health interventions.

A literature review and meta-analysis has demonstrated almost unanimous evidence in favour of primary care staff providing advice to patients about weight loss (Rose et al. 2013). However, some studies reported that while overweight patients responded well to advice, obese patients were less likely to act on advice. Thus advice from clinicians is likely to be effective in overweight patients. Despite this, some clinicians are reluctant to engage with patients, General Practitioners (family physicians) in London were reported to consider that weight should be managed by patients themselves and should not be within the role of the physician. However this may not reflect current opinion, as these results were from a study reported in 2005. One reason for this lack of enthusiasm may be that physicians perceived that patients did not adhere to dietary advice, whereas patients stated they found dietary advice ineffective and sometimes ignored or adapted it (McClinchy et al. 2013). Furthermore, patients viewed structural influences such as the time available to shop and cook, as important factors in non-adherence. McClinchy et al noted weight management was the predominant dietary topic discussed by physicians and healthy eating was rarely mentioned outside of weight management.

As shown above NCD causes nearly 70% of deaths worldwide and 82% of the 16 million people who died prematurely, or before reaching 70 years of age, occur in low- and middle-

income countries (World Health Organisation 2016). Thus a study that considered how NCD could be prevented in newly industrialised countries was indicated.

METHODS

Aims

In the overall CIH study it was hypothesised that the synergy resulting from addressing the community, workplaces, schools and clinicians would reduce risk factors for NCD. Here we report on clinicians. The overall aim of CIH with respect to clinicians was that they would help patients, who came to them for a consultation for any reason, to reduce risk factors for NCD.

In this paper it is hypothesised that CIH interventions among clinicians will increase:-

- Preparedness to advise patients to reduce tobacco use, improve dietary intake and increase physical activity
- Use of tests and measurements relevant to NCD
- Discussion of risk factors for NCD with patients
- Advice and treatment for smoking cessation, weight loss and increased physical activity
- Availability of interventions (e.g. medication, counselling, referral to other agencies)
- Use of available interventions

Design

The CIH study was designed as a whole community, comparator group study incorporating action-orientated research to examine the prevalence and secular trends of risk factors for NCD. The full methodology for CIH has been reported previously (O'Connor Duffany et al. 2011) and the specific sampling has also been given (Anthony et al. 2015, Dyson et al. 2015). In essence two geographically separate but similar areas were compared in each site. The specific interventions were designed locally due to the cultural differences between the sites and thus the interventions were not (by design) standardized. A standardized set of interventions give the appearance of scientific rigour but an intervention appropriate in one site might be wholly inappropriate in another. Our approach was to evaluate the community intervention model, not the specific components of the model, which necessarily vary across sites. Training was supplied by the local teams at each site.

Sample/participants

CIH took place in three different sites in Hangzhou city in China, Kerala in India and in Mexico City. CIH was conducted in four main settings; health centres, workplaces, schools and the community at large. The data reported here relate to information collected from questionnaires administered to clinicians.

CIH implemented interventions in the community and workplaces and these are discussed elsewhere (Dyson et al. 2015). In each clinical site posters were developed and displayed on the hazards of tobacco and passive smoking, health benefits of physical activity and healthy eating. Tobacco-free policy was implemented and “No Smoking” signs displayed. In addition each site decided its own culturally specific approach. The interventions that were relevant to clinicians were:-

- Tobacco: Staff were trained to deliver smoking cessation advice (China).

- Physical activity: Point of decision prompts were displayed by lifts and stairwells (China, India) to increase physical activity. Work-break exercises and sports interest groups were organised (China). Marked walking paths around the sites were created (Mexico).
- Diet: Healthy eating workshops were provided (Mexico). Vegetable seeds and fertilizer were distributed and training provided on vegetable cultivation (India). Healthy foods in canteens were introduced and point of decision prompts for such healthy eating displayed (India).

Data collection

Baseline and follow-up data were collected from a sample of clinical sites within each intervention and control site. All health employees (doctors, nurses, allied health professionals) at each of the clinical sites were invited to complete surveys. The information collected included the frequency of risk factors assessment in routine clinical consultations, how prepared clinicians felt to offer advice and the availability of resources to address risk factor reduction. Data were collected at baseline and after 18-24 months follow-up.

Ethics

Ethical approval was obtained in each country site from appropriate institutional review boards. China: IRB00001052-08003 certified by Peking University Medical Ethics Committee, India: IEC/184 (IEC is Independent Ethics Committee), Mexico: Oficio JST /1003 /08 (JST is Jurisdicción Sanitaria Tlalpan or Tlalpan Health Jurisdiction).

Validity and reliability

The CIH questionnaire was designed by a development team with representation from the three sites and external consultants. It was based on previously validated questionnaires including the Global Adults Tobacco Survey (GATS) (World Health Organisation 2007), WHO STEPwise approach to surveillance (STEPS) (World Health Organisation 2008) and the International Physical Activity Questionnnaire (IPAQ) (Craig et al. 2003). The development of the CIH questionnaire is discussed elsewhere (O'Connor Duffany et al. 2011). Surveys were adapted, translated and backtranslated by experts at the study sites or at the study Evaluation Coordination Center. Field tests were conducted from May to July 2008 at all sites and some minor revisions were made to country specific items.

Data analysis

Logistic regression was employed to determine differences between groups and time periods which allows for differences in baseline of risk factors. A logistic regression analysis was conducted with risk factors as dependent variables. Independent variables were time (baseline/follow-up, with baseline as reference category), gender (male reference category) and age. A difference in differences (DiD) approach similar to that used by Vanderos et al (Vanderos et al. 2013) was employed to determine the effect of the interventions. Occupational group (nurse, physician or other), type of site (hospital, primary care clinic or other) and gender were used as co-variates.

RESULTS

There were 2280 respondents at baseline, see Table 1, and 2501 at follow-up. Most respondents were nurses or physicians.

The proportion of physicians completing the surveys decreased from 29.9% to 16.2% in the control and from 29.6% to 23.0% in the intervention, with concomitant increases in the proportion of nurses and other health workers. To account for these differences, a logistic regression analysis was employed and in all analyses in this paper the odds ratios refer to those of the DiD variable (zero for baseline in all cases and for control at follow-up and unity for intervention at follow-up).

In the intervention group, staff felt more prepared to offer advice about the risk factors for NCD with increases in preparedness to offer advice about stopping smoking and improving diet which were statistically significant (Table 2).

There were significant differences between the intervention and control groups for performing measurements and biochemical tests, with clinicians in the control group more likely to take measurements of height, hip, waist and skinfold thickness, but less likely to undertake tests of serum cholesterol and blood pressure. There were no significant differences between the two groups for the likelihood of clinicians discussing the risk factors for NCD with their patients during consultations (Table 3).

The resources available for clinicians were explored and it appeared that there were many more available resources for both professionals and patients in the intervention area. Counselling, referrals, traditional remedies (e.g. herbs such as chamomile, mint, linden, tila and cardamom), self-help materials and access to smoking cessation programmes were all more accessible in the intervention sites. Slimming clubs and smoking cessation classes were available in both intervention and control areas, although there was one more for tobacco cessation in the intervention area and one more for improving diet in the control area. Clinicians in the control area had greater access to medications as shown in Table 4.

There were some differences in the type of resources used in the intervention and control areas (Table 5). Counselling for all three risk factors of tobacco use, diet and physical activity and referral to smoking cessation programmes were more used in the intervention sites. Medication was more likely to be prescribed in control sites. Traditional remedies were more used in the intervention area and complementary medicine more in control areas. Both intervention and control used slimming clubs, with those in the control area more likely to be utilised for dietary advice and those in the intervention area for increased physical activity.

DISCUSSION

Stead et al (2013) and Rice et al (2013) offer clear evidence for the effectiveness of tobacco cessation for patients who use tobacco but present for other reasons. This approach, showing a strong evidence base for nurse and physician interventions in tobacco cessation was applied in CIH. All clinical staff, whether they were nurses or physicians, were encouraged to offer advice and pharmacotherapy to patients who used tobacco but who were consulting a clinician for other reasons. All three country sites displayed posters about the hazards of tobacco and passive smoking, but only in in China were staff trained to deliver smoking cessation advice. Although staff in the intervention sites did not discuss smoking status or give more advice than

those in the control areas, they reported feeling more prepared to advise reducing or stopping smoking. Implementing smokefree health centres and hospital sites encourages tobacco cessation and this was done in both China and India and further supported with "No Smoking" signs in strategic locations. For example, a large hospital in the intervention area in China was designated a no-smoking zone for staff and patients alike and this was advertised with a large sign mounted on the front of the façade. Reflecting staff training in cessation, pharmacotherapy was less available on intervention sites and counselling was used more frequently than in the control area.

In India and China posters about the benefits of physical activity were developed and displayed and point of decision prompts were put in stairwells and by lifts in clinical sites. In China work-break exercises and sports interest groups were organised and in Mexico marked walking paths around worksites were created in clinical sites. These interventions should affect physical activity although similar interventions in workplaces in the CIH sites showed no significant changes (Dyson et al. 2015).

In China and India posters about healthy eating were developed and displayed. In India healthy cooking classes were provided and in Mexico healthy eating workshops were delivered. In India, vegetable seeds and fertilizer were distributed and training on vegetable cultivation provided along with introduction of healthy foods in canteens and the display of point of decision prompts. The above interventions were implemented in all workplaces, including clinical sites. In China, health centre staff were trained in healthy eating and given desk manuals to use in health education. In India, healthy vegetarian lunches were introduced in hospital canteens and healthy cooking demonstrations were held in workplaces including health centres.

There is strong evidence that a combination of interventions (diet and physical activity) is more effective than each alone (Johns et al. 2014). This combination approach was used to design the CIH interventions. Probably the single most useful intervention that a clinician can make is to offer simple advice to patients on the risk factors for chronic disease; specifically tobacco, diet and physical activity. The persistent thread in studies is that simple advice given in a short time period, with no reinforcement can have a positive effect on tobacco use, physical exercise, diet and weight loss (Hartley et al. 2013, Rice et al. 2013, Rose et al. 2013, Stead et al. 2013). Despite this, clinicians often do not take the opportunity to discuss these issues, although it is probably not because patients are resistant to hearing such advice. In a Swedish study, for example, GPs were assessed as being too restrained in giving such advice, yet patients who did receive this advice were more satisfied with their visit to the doctor (Johansson et al. 2005). Older patients, men, patients with scheduled rather than unscheduled appointments and those with poorer self-reported health were more likely to receive advice on risk factor reduction. During the interventions period in CIH, recommendations were made that all patients should receive advice for NCD risk factor reduction, rather than restrict this to high-risk individuals.

In the intervention sites, clinicians were more confident in giving advice on smoking, diet and physical exercise (though changes in advice about physical activity did not reach statistical significance). It is of note that while the intervention group was more likely to test serum cholesterol and blood pressure the clinicians were less likely to measure height, hip, waist and skinfold thickness. Clinicians in intervention sites had more access (or possibly more awareness of availability) of resources and used counselling and smoking cessation programmes more often and medication less often than clinical staff in the control areas. The interventions utilised included health education posters for tobacco cessation, improving diet

and physical activity, implementing tobacco free policies, point of decision prompts, initiatives to increase physical activity and to improve personal dietary intake by offering healthy canteen food. These interventions would appear to make intervention clinicians more aware of, and more willing, to give psycho-social interventions such as counselling for smoking, diet and physical exercise and referral to community based organisations for physical exercise. It should be noted that staff in the control areas used more pharmacotherapy than those in the intervention areas. A useful lesson may be that while advocating psycho-social interventions such as counselling (which is effective), clinicians should also be encouraged to offer pharmacotherapy as the combination is more effective than either alone.

Previous studies have shown community based interventions had an impact on risk factors in the workplace (Dyson et al. 2015) and community (Dyson et al. 2015) and this study shows further evidence for its effectiveness in clinical areas.

Limitations

Results are based on self-completed questionnaires, which may lead to inaccurate data recording. Although the CIH study was not randomised at the individual level, it did have a control group and a rigorous methodology. Baseline differences were allowed for in a regression analysis and a DiD approach was taken so these results should be considered robust.

CONCLUSION

Nurses working in hospitals and clinics may facilitate interventions to improve public health. Nurses are the largest health workforce and are ideally placed to encourage healthy living through better diet, exercise and tobacco cessation. The most important message in terms of practice is that regardless of the reason for a patient encounter there is an opportunity for a brief discussion of NCD risk factors. As seen in the background section these can be as effective as more time consuming interventions.

Traditionally nurse training has not focussed on public health and nurses, especially in secondary and tertiary hospital settings, have little training on reducing risk factors for NCD. Nursing curricula are however increasingly incorporating public health which is a positive step.

RELEVANCE TO CLINICAL PRACTICE

Interventions such as CIH address the whole population rather than focus on at risk groups. These interventions are relatively cheap partly as they do not require the at risk groups to be identified. Population based interventions with even small effects can have a significant impact on NCD. Nurses are the largest clinical group and are well placed to offer advice and refer to relevant support.

REFERENCES

Anthony D, Dyson PA, Lv J, Thankappan KR, Fernandez MT & Matthews DR (2015): Reducing Health Risk Factors in Workplaces of Low and Middle-Income Countries. Public Health Nursing **32**, 478-487.

Craig CL, Marshall AL, Sjostrom M, Bauman AE, Booth ML, Ainsworth BE, Pratt M, Ekelund U, Yngve A, Sallis JF & Oja P (2003): International physical activity

questionnaire: 12-country reliability and validity. Med Sci Sports Exerc **35**, 1381-1395.

Dyson PA, Anthony D, Fenton B, Stevens DE, Champagne B, Li L-M, Lv J, Ramírez Hernández J, Thankappan KR, Matthews DR & Community Interventions for Health c (2015): Successful Up-Scaled Population Interventions to Reduce Risk Factors for Non-Communicable Disease in Adults: Results from the International Community Interventions for Health (CIH) Project in China, India and Mexico. Plos One **10**, e0120941.

Hartley L, Igbinedion E, Holmes J, Flowers N, Thorogood M, Clarke A, Stranges S, Hooper L & Rees K (2013): Increased consumption of fruit and vegetables for the primary prevention of cardiovascular diseases. Cochrane Database Syst Rev **6**, CD009874.

Johansson K, Bendtsen P & Akerlind I (2005): Advice to patients in Swedish primary care regarding alcohol and other lifestyle habits: how patients report the actions of GPs in relation to their own expectations and satisfaction with the consultation. Eur J Public Health **15**, 615-620.

Johns DJ, Hartmann-Boyce J, Jebb SA & Aveyard P (2014): Diet or exercise interventions vs combined behavioral weight management programs: a systematic review and meta-analysis of direct comparisons. J Acad Nutr Diet **114**, 1557-1568.

Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, Abraham J, Adair T, Aggarwal R, Ahn SY, Alvarado M, Anderson HR, Anderson LM, Andrews KG, Atkinson C, Baddour LM, Barker-Collo S, Bartels DH, Bell ML, Benjamin EJ, Bennett D, Bhalla K, Bikbov B, Bin Abdulhak A, Birbeck G, Blyth F, Bolliger I, Boufous S, Bucello C, Burch M, Burney P, Carapetis J, Chen H, Chou D, Chugh SS, Coffeng LE, Colan SD, Colquhoun S, Colson KE, Condon J, Connor MD, Cooper LT, Corriere M, Cortinovis M, de Vaccaro KC, Couser W, Cowie BC, Criqui MH, Cross M, Dabhadkar KC, Dahodwala N, De Leo D, Degenhardt L, Delossantos A, Denenberg J, Des Jarlais DC, Dharmaratne SD, Dorsey ER, Driscoll T, Duber H, Ebel B, Erwin PJ, Espindola P, Ezzati M, Feigin V, Flaxman AD, Forouzanfar MH, Fowkes FG, Franklin R, Fransen M, Freeman MK, Gabriel SE, Gakidou E, Gaspari F, Gillum RF, Gonzalez-Medina D, Halasa YA, Haring D, Harrison JE, Havmoeller R, Hay RJ, Hoen B, Hotez PJ, Hoy D, Jacobsen KH, James SL, Jasrasaria R, Jayaraman S, Johns N, Karthikeyan G, Kassebaum N, Keren A, Khoo JP, Knowlton LM, Kobusingye O, Koranteng A, Krishnamurthi R, Lipnick M, Lipshultz SE, Ohno SL, Mabweijano J, MacIntyre MF, Mallinger L, March L, Marks GB, Marks R, Matsumori A, Matzopoulos R, Mayosi BM, McAnulty JH, McDermott MM, McGrath J, Mensah GA, Merriman TR, Michaud C, Miller M, Miller TR, Mock C, Mocumbi AO, Mokdad AA, Moran A, Mulholland K, Nair MN, Naldi L, Narayan KM, Nasseri K, Norman P, O'Donnell M, Omer SB, Ortblad K, Osborne R, Ozgediz D, Pahari B, Pandian JD, Rivero AP, Padilla RP, Perez-Ruiz F, Perico N, Phillips D, Pierce K, Pope CA, 3rd, Porrini E, Pourmalek F, Raju M, Ranganathan D, Rehm JT, Rein DB, Remuzzi G, Rivara FP, Roberts T, De Leon FR, Rosenfeld LC, Rushton L, Sacco RL, Salomon JA, Sampson U, Sanman E, Schwebel DC, Segui-Gomez M, Shepard DS, Singh D, Singleton J, Sliwa K, Smith E, Steer A, Taylor JA, Thomas B, Tleyjeh IM, Towbin JA, Truelsen T, Undurraga EA, Venketasubramanian N, Vijayakumar L, Vos T, Wagner GR, Wang M, Wang W, Watt K, Weinstock MA, Weintraub R, Wilkinson JD, Woolf AD, Wulf S, Yeh

PH, Yip P, Zabetian A, Zheng ZJ, Lopez AD, Murray CJ, AlMazroa MA & Memish ZA (2012): Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet **380**, 2095-2128.

McClinchy J, Dickinson A, Barron D & Thomas H (2013): Practitioner and patient experiences of giving and receiving healthy eating advice. Br J Community Nurs **18**, 498, 500-494.

O'Connor Duffany K, Finegood D, Matthews D, McKee M, Venkat Narayan KM, Puska P, Siegel K, Stevens D, Wong F, Woodward M & Yach D (2011): Community Interventions for Health (CIH): A novel approach to tackling the worldwide epidemic of chronic diseases CVD Prevention and Control **6**, :47-56.

Rice VH, Hartmann-Boyce J & Stead LF (2013): Nursing interventions for smoking cessation. Cochrane Database Syst Rev **8**, CD001188.

Rose SA, Poynter PS, Anderson JW, Noar SM & Conigliaro J (2013): Physician weight loss advice and patient weight loss behavior change: a literature review and meta-analysis of survey data. Int J Obes (Lond) **37**, 118-128.

Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J & Lancaster T (2013): Physician advice for smoking cessation. Cochrane Database Syst Rev **5**, CD000165.

Vanderos S, Hessel P, Leone T & Avendana M (2013): Have health trends worsened in Greece as a result of the financial crisis? A quasi-experimental approach. European Journal of Public Health **23**, 727-731.

World Health Organisation (2007) Global Adult Tobacco Survey (GATS). Available from: www.who.int/tobacco/publications/surveillance/tqs/en/index.html. WHO, Geneva.

World Health Organisation (2008) WHO STEPS Survellance Manual. WHO, Geneva, Switzerland.

World Health Organisation (2016). Available at: http://www.who.int/ncds/introduction/en/.

World Health Organization (2015) Non communicable diseaes progress monitor. WHO, Geneva.

Table 1 Type of health care worker - Baseline

Professional group	N	%
Nurse	1224	53.7
Physician	677	29.7
Traditional healer/ Complementary or Alternative medicine	96	4.2
Health promotion worker	78	3.4
Country-specific	64	2.8
Other	61	2.7
Pharmacist/ chemist	50	2.2
Physiotherapist	12	0.5
Dietician	11	0.5
Occupational Therapist	6	0.3
Missing	1	0.0

Total	2280	100.0

Table 2. How prepared to advise patients

	Odds ratio	95% CI	p-value
How to reduce/stop smoking	1.255	1.040, 1.443	0.015
How to improve their diet	1.213	1.025, 1.436	0.024
How to increase their physical activity	1.173	0.972, 1.416	0.097

Table 3: Tests, risk factor and advice

Risk factor	Odds ratio	95% CI	p-value
Tests / Measurements:			
Weight?	1.167	0.965,1.410	0.110
Height?	0.757	0.626, 0.916	0.004
Hip circumference?	0.630	0.505, 0.786	<0.001
Waist circumference?	0.646	0.518, 0.804	<0.001
Skin fold?	0.574	0.437, 0.754	<0.001
Blood cholesterol (LDL, HDL and/or total cholesterol)?	1.458	1.170, 1.816	0.001
Blood pressure?	1.240	1.010, 1.522	0.040
Fasting blood glucose?	1.162	0.951, 1.420	0.142
Discuss risk factors:			
The patient's current weight status/BMI?	0.940	0.776, 1.139	0.528
The importance and composition of a healthy diet?	0.852	0.707, 1.028	0.095
The patient's current level of physical activity?	0.945	0.780, 1.143	0.559
The patient's current smoking status?	1.022	0.843, 1.240	0.821
The health effects of tobacco and/or smoking?	0.793	0.849, 1.239	0.793
Give advice or treatment for:			
How to lose weight?	0.874	0.724, 1.055	0.160
Increasing physical activity?	0.831	0.815, 1.185	0.855
How to reduce/stop smoking?	0.843	0.809, 1.192	0.854

Table 4: Available resources

Interventions	Odds ratio	95% CI	p-value
Medication (e.g., nicotine gum or patch; diet pills) Stop smoking	0.730	0.609, 0.876	0.001
Medication (e.g., nicotine gum or patch; diet pills) Improve diet	0.766	0.644, 0.912	0.003
Individual or group counselling (other than smoking cessation) Stop smoking	1.342	1.136, 1.585	0.001
Individual or group counselling (other than smoking cessation) Improve diet	1.860	1.578, 2.192	<0.001
Individual or group counselling (other than smoking cessation) Increase physical activity	1.671	1.405, 1.986	<0.001
Traditional Remedies: To stop smoking	1.272	1.053, 1.535	0.012
Traditional Remedies: To improve diet	1.480	1.247, 1.758	<0.001
Traditional Remedies: To increase physical activity	1.348	1.105, 1.644	0.003
Other complementary medicine: chiropractor or acupuncture Stop smoking	0.855	0.683, 1.070	0.171
Other complementary medicine: chiropractor or acupuncture Improve diet	0.924	0.760, 1.123	0.428
Other complementary medicine: chiropractor or acupuncture Increase physical activity	0.903	0.743, 1.098	0.306
Self-help materials Stop smoking	1.033	0.874, 1.219	0.706
Self-help materials Improve diet	1.383	1.172, 1.633	<0.001
Self-help materials Increase physical activity	1.359	1.154, 1.599	<0.001
Referral to another health care professional (e.g., practice nurse) Stop smoking	1.319	1.121, 1.551	0.001
Referral to another health care professional (e.g., practice nurse) Improve diet	1.092	0.930, 1.282	0.284
Referral to another health care professional (e.g., practice nurse) Increase physical activity	1.110	0.940, 1.310	0.217
Referral to a community-based organisation that has programmes to address Stop smoking	1.274	1.076, 1.508	0.005
Referral to a community-based organisation that has programmes to address Improve diet	1.079	0.910, 1.280	0.380
Referral to a community-based organisation that has programmes to address Increase physical activity	1.213	1.023, 1.439	0.026
Smoking cessation programme Stop smoking	1.617	1.346, 1.944	<0.001
Slimming club: Improve diet	0.800	0.668, 0.957	0.015

Interventions	Odds ratio	95% CI	p-value
Slimming club: Increase physical activity	1.213	1.007, 1.461	0.042

Table 5: Use of resources

Interventions used	**Odds ratio**	**95% CI**	**p-value**
Medication (e.g., nicotine gum or patch; diet pills) Stop smoking	0.777	0.648, 0.931	0.006
Medication (e.g., nicotine gum or patch; diet pills) Improve diet	0.701	0.585, 0.839	<0.001
Individual or group counselling (other than smoking cessation) Stop smoking	1.309	1.110, 1.543	0.001
Individual or group counselling (other than smoking cessation) Improve diet	1.433	1.216, 1.687	<0.001
Individual or group counselling (other than smoking cessation) Increase physical activity	1.298	1.089, 1.547	0.004
Traditional Remedies: Stop smoking	1.082	0.892, 1.312	0.425
Traditional Remedies: Improve diet	1.273	1.067, 1.519	0.007
Traditional Remedies: Increase physical activity	1.374	1.116, 1.692	0.003
Other complementary medicine: chiropractor or acupuncture: Stop smoking	0.722	0.571, 0.912	0.006
Other complementary medicine: chiropractor or acupuncture: Improve diet	0.727	0.590, 0.897	0.003
Other complementary medicine: chiropractor or acupuncture: Increase physical activity	0.632	0.511, 0.783	<0.001
Self-help materials: Stop smoking	0.950	0.803, 1.125	0.554
Self-help materials: Improve diet	1.146	0.970, 1.353	0.109
Self-help materials: Increase physical activity	1.087	0.923, 1.279	0.318
Referral to another health care professional (e.g., practice nurse) Stop smoking	1.144	0.973, 1.345	0.104
Referral to another health care professional (e.g., practice nurse) Improve diet	1.087	0.926, 1.277	0.308
Referral to another health care professional (e.g., practice nurse) Increase physical activity	0.916	0.776, 1.081	0.300
Referral to a community-based organisation that has programmes to address Stop smoking	0.966	0.843, 1.195	0.966
Referral to a community-based organisation that has programmes to address Improve diet	1.047	0.878, 1.248	0.609
Referral to a community-based organisation that has programmes to address Increase physical activity	1.068	0.900, 1.267	0.543
Smoking cessation programme Stop smoking	1.376	1.148, 1.649	0.001
Slimming club: Improve diet	0.713	0.595, 0.854	<0.001
Slimming club: Increase physical activity	1.173	0.972,	0.097

Interventions used	Odds ratio	95% CI	p-value
		1.416	