UNIVERSIDADE DA BEIRA INTERIOR
Ciências da Saúde

The Role of Healthcare Professionals in Tobacco Control

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Tese para obtenção do Grau de Doutor em
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Dedicatory

This race has a goal
No winner no loser
While the student crosses the line
The master should not be forgotten:
He is the winner struggling for others to win!

To the memory of Maria da Luz, my beloved teacher of Saint Julian's primary school; and to all teachers that I was gifted to meet through life and with whom I have learnt the joy and freedom of critical thinking.

You shall above all things be glad and young
for if you're young, whatever life you wear
it will become you; and if you are glad
whatever's living will yourself become

I'd rather learn from one bird how to sing
than teach ten thousand stars how not to dance

e.e. cummings

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Looking to the river Tagus

Lisbon, July 2015.

Resumo Alargado

Introdução e objetivos

A epidemia tabágica é uma das principais causas de morbilidade e morte prematura e continua a expandir-se globalmente. O tabagismo é também a principal causa evitável de morte. No entanto, mudar o paradigma é possível. Segundo a Organização Mundial da Saúde, a principal estratégia para travar a epidemia passa por contrariar as táticas da indústria do tabaco através da implementação de políticas para regular as atividades desta indústria. Acresce que é também crucial sensibilizar e educar a opinião pública sobre os riscos para a saúde associados ao consumo do tabaco e envolver ativamente a sociedade civil no controlo do tabagismo.

A perceção dos riscos do tabaco pela população e as normas sociais relativas ao tabagismo mudam lentamente ao longo do tempo. Por tal motivo, é necessário uma liderança firme e uma ação sustentada de saúde pública. Os profissionais de saúde, educadores, decisores políticos, governos, organizações não-governamentais (ONGs), os *media* e a sociedade em geral devem trabalhar conjuntamente, numa parceria concertada para promover as melhores práticas de controlo de tabagismo e diminuir a aceitação social do tabaco. Entre os vários atores sociais envolvidos no ativismo político de controlo de tabaco, os profissionais de saúde têm um papel crucial a desempenhar. Todos os profissionais de saúde, e muito especialmente os médicos, devem ser exemplos e líderes de saúde pública, comportando-se como modelos sendo "não fumadores"; educando a população sobre os riscos do tabaco e da exposição ao fumo ambiental de tabaco (FAT) e os benefícios da cessação tabágica; promovendo a cessação; identificando sistematicamente os fumadores na prática clínica, aconselhando-os a parar de fumar e apoiando a cessação; e, por último, intervindo no processo da negociação política da implementação das medidas de controlo do tabaco, influenciando a decisão. Em Portugal, a prevalência de tabagismo, avaliada nos inquéritos nacionais de saúde e outros inquéritos à população geral, mostra que o consumo de tabaco é elevado em muitos grupos etários, além de ter aumentado substancialmente nas mulheres dos 15 aos 70 anos ao longo das últimas três décadas. Acresce que o consumo aumentou recentemente nos jovens. Além disso, apenas uma minoria dos fumadores atuais expressa o desejo de cessar de fumar ou recorre ao tratamento de cessação tabágica. Estas tendências sublinham a necessidade de uma estratégia nacional de controlo de tabagismo efectiva e sustentada. Em 2012, foi aprovado um programa nacional de prevenção e controlo de tabaco, o que é certamente uma oportunidade para avançar o controlo do tabagismo em Portugal. No entanto, sem um financiamento adequado e a participação plena da sociedade civil e sua capacitação, o plano dificilmente conseguirá alcançar os objetivos. Entre os vários atores sociais, os médicos e os profissionais de saúde portugueses deverão ser modelos como não fumadores e líderes de saúde pública e de ativismo político na prevenção e

controlo do tabagismo. No entanto, é escasso o conhecimento do comportamento tabágico dos médicos portugueses e do seu envolvimento no controlo de tabagismo.

Neste contexto, o projeto de investigação conduzido nesta tese teve como objetivo explorar o envolvimento no controlo do tabagismo dos profissionais de saúde portugueses e, em particular dos médicos, e a associação deste envolvimento com a mudança da norma social em relação ao tabaco, descrevendo as tendências do comportamento tabágico entre os médicos e os profissionais de saúde, assim como as suas atitudes e crenças em relação ao FAT e às políticas de espaços livres de fumo, e por último investigar a sua participação em atividades de prevenção e controlo do tabaco. Foram também investigados os fatores associados com as atitudes de controlo de tabagismo e com a participação dos médicos e profissionais de saúde em atividades de controlo do tabagismo. As atitudes e crenças em relação à exposição ao FAT e às políticas de proteção ao FAT foram estudadas como medidas indiretas robustas das normas sociais respeitantes ao tabaco. Com efeito, de acordo com a literatura científica, estas medidas estão fortemente relacionadas com o apoio às políticas de prevenção e controlo de tabagismo e com a mudança da norma social a favor da diminuição da aceitação social do tabagismo. O consumo de tabaco e a formação em tabagismo foram sistematicamente explorados como as principais variáveis independentes, uma vez que o consumo do tabaco e a falta de formação são considerados as principais barreiras que travam o envolvimento dos profissionais de saúde no controlo do tabagismo. Foi investigado se os médicos portugueses se comportam como modelos não-fumadores, fumando menos do que a população em geral, relatando uma maior motivação para cessar de fumar, ou deixando de fumar mais cedo do que a população geral. Além disso, foi investigado se os médicos portugueses atuam como líderes de saúde pública, seja relatando atitudes mais positivas e maior apoio às políticas de proteção à exposição do FAT do que a população geral ou de que outros profissionais de saúde, seja participando ativamente em atividades de controlo de tabagismo. Finalmente, foi avaliada a associação entre o envolvimento dos profissionais de saúde e dos médicos no controlo do tabagismo e a mudança da norma social em relação à exposição ao FAT.

Métodos

Tipo de estudo: transversal descritivo. Abordagem metodológica: quantitativa. De todos os estudos, apenas um usou uma metodologia mista, ou seja simultaneamente quantitativa e qualitativa.

A colheita de dados baseou-se nos seguintes instrumentos:

- questionários autoadministrados adaptados da *Global Network for Tobacco Free Health Care Services*, 2007, usando ferramentas padronizadas validadas (metodologia quantitativa).
- questionários administrados por entrevista que foram baseados num trabalho de campo preliminar através de entrevistas semiestruturadas; e observação direta no local utilizando uma lista de verificação- *check list* (metodologia mista).

Foram realizados vários estudos transversais baseados em questionários aplicados em diferentes locais ou contextos visando profissionais de saúde e outros grupos profissionais. Foram escolhidos dois locais ou *settings* para estudar os funcionários de um hospital português e uma amostra de médicos portugueses: o hospital universitário da Covilhã e dois congressos médicos nacionais. Por último, um estudo adicional do tipo transversal baseado em entrevistas, visando um grupo específico da população geral num ambiente pró-tabágico, explorou eventuais mudanças da norma social em relação ao tabaco.

O estudo transversal que decorreu no hospital universitário foi realizado antes da proibição nacional de fumar nos locais fechados que entrou em vigor em Janeiro de 2008. Este inquérito baseou-se num questionário autoadministrado a todos os funcionários do hospital, incluindo profissionais de saúde e outros funcionários, através do qual foram investigadas as seguintes variáveis:

- o comportamento tabágico
- as atitudes e crenças em relação ao FAT
- os fatores associados ao comportamento de fumar, à concordância com as políticas de proteção ao FAT e à discordância com a exposição ao FAT
- as atitudes em relação à cessação do tabagismo, as práticas clínicas de cessação tabágica e as necessidades de formação em tabagismo.

Além disso, foram investigadas e comparadas, entre os diferentes subgrupos de profissionais de saúde, as atitudes e as práticas clínicas de cessação tabágica, assim como as necessidades de formação em tabagismo.

O inquérito visando uma amostra nacional de médicos decorreu em 2009, após a implementação da proibição nacional de fumar nos locais fechados, tendo sido realizado durante dois congressos médicos nacionais de grande dimensão, de modo a incluir médicos de medicina geral e familiar (MGF), médicos hospitalares, estudantes de medicina e recém-licenciados, respetivamente:

- Congresso Anual da Sociedade Portuguesa do Acidente Vascular Cerebral - Fevereiro de 2009, Porto. Os questionários foram distribuídos consecutivamente a todos os 450 médicos conferencistas, durante o registo efetuado pelo secretariado.
- Congresso Anual da Associação Portuguesa de MGF- Março de 2009, Vilamoura. Os questionários foram distribuídos por 500 médicos conferencistas (amostragem sistemática correspondente a 33,0% do total de 1500 participantes).

O cálculo teórico da dimensão da amostra foi de 500 médicos, assumindo uma prevalência esperada de 22,0%, com um intervalo de confiança (IC) de 95% e uma precisão de 3,6%.

Este estudo explorou o envolvimento dos médicos portugueses no controlo de tabagismo (CT), avaliando as seguintes questões:

- formação em CT e consciência das necessidades de formação
- participação em atividades de CT
- atitudes e crenças em relação ao FAT e ás políticas de proteção ao FAT
- concordância com as políticas abrangentes de proteção da exposição ao FAT.

O inquérito de base populacional correspondeu a um estudo transversal de metodologia mista que explorou a efetividade da regulamentação da proibição parcial de fumar e a mudança da norma social em relação à exposição ao FAT num ambiente pró-tabagico, visando uma população específica, nomeadamente os taxistas da cidade de Lisboa. Este local ou contexto foi escolhido intencionalmente por se tratar de um "ambiente natural" onde as fronteiras entre locais privados e públicos, regulamentados e não regulamentados, são ténues, permitindo investigar a mudança da norma social. Este estudo foi realizado durante janeiro de 2009 e dezembro de 2010, ou seja após a implementação da legislação da proibição de fumar nos espaços fechados e transportes públicos. Foi realizada uma amostragem não probabilística do tipo "*purposive sampling*" em ruas de Lisboa selecionadas para o efeito. Foram realizadas entrevistas estruturadas e observação direta no local por investigadores treinados enquanto usavam os serviços de táxi como "clientes oportunistas naturais". A efetividade da regulamentação de fumar foi definida genericamente pelo conhecimento da proibição de fumar e da sua fundamentação e pela concordância em relação a esta regulamentação, assim como pelo cumprimento e execução da lei que regula o comportamento de fumar nos locais públicos fechados.

Resultados principais

A taxa de participação foi de 52,9% entre os funcionários do hospital, 64,0% entre os médicos conferencistas e 98,8% entre os motoristas de táxi.

Tendências do comportamento de fumar

Funcionários do hospital

Participaram no inquérito 589 funcionários do hospital, dos quais 65,9% eram do sexo feminino; a média de idade foi de 38,3 ± 9,9 anos (20↔68). A prevalência de tabagismo entre os funcionários do hospital foi bastante elevada: 40,5% (95% IC: 33,6-47,4) no sexo masculino, 23,5% (95% IC: 19,2-27,8) no sexo feminino (p<0,001); 43,2% em auxiliares, 26,1% nos enfermeiros, 18,9% entre os médicos, e 34,7% entre os outros funcionários de profissões técnicas ou administrativas não clínicas (p=0,024). A taxa de participação foi significativamente mais baixa entre os médicos (30,8%). Embora a maioria dos fumadores expressasse intenção para cessar, poucos relataram estar preparados para tal no futuro próximo. Fumar nas instalações hospitalares, bem como em ambientes fechados privados (fumar em casa e no carro), era uma prática comum.

Inquérito dos médicos conferencistas

No total, 608 médicos participaram no inquérito: 58,4% médicos de MGF; 32,4% médicos hospitalares e 9,2% estudantes de medicina e recém-licenciados; 62,7% eram do sexo feminino; a idade média foi 39,1 ± 12,9 anos (21↔70).

A prevalência de tabagismo dos médicos foi de 29,1% no género masculino (95% IC: 23,2-35,0) e 16,0% no género feminino (95% IC: 12,3-19,7), p <0,001. A maioria dos médicos mais jovens relatou nunca ter fumado regularmente, independentemente do género, em contraste com os mais velhos. A prevalência de tabagismo não foi influenciada pela especialidade, ou seja os médicos de MGF relataram prevalências similares aos dos médicos hospitalares. Entre os fumadores, 51,2% relatou fumar diariamente; 30,7% relatou querer cessar de fumar. Quando comparado com uma amostra aleatória da população portuguesa, emparelhada por género/idade/educação, a prevalência de tabagismo dos médicos do género masculino foi semelhante à da população geral, sendo que estes médicos expressaram baixa motivação para cessar de fumar e taxas de cessação mais baixas, cessando de fumar mais tarde do que a população geral. Em contrapartida, as médicas relataram fumar menos, embora apresentassem taxas de cessação e idade média de cessação semelhantes à população geral. Metade dos médicos que relatou já ter fumado consolidou o consumo regular de tabaco durante o curso de medicina. Esta tendência observou-se tanto nos médicos mais jovens (<45 anos) como nos mais velhos (>45 anos). Os médicos mais jovens, independentemente do género, relataram fumar

ocasionalmente mais frequentemente do que a população em geral, sugerindo um padrão de consumo emergente. No entanto, o tabagismo ocasional foi significativamente associado a menor motivação para deixar de fumar. Por último, a maioria dos médicos, incluindo os estudantes de medicina, relatou apoio limitado à cessação nos seus locais de trabalho ou universidades.

Atitudes de controlo de tabagismo e concordância com a regulamentação da proteção à exposição ao fumo ambiental de tabaco

Inquérito aos funcionários hospitalares

A maioria dos funcionários relatou um comportamento passivo em relação à assertividade para a proteção da exposição ao FAT; ou seja, admitiu não reclamar sobre a exposição ao FAT, apesar de percecionar que esta exposição era elevada nas instalações hospitalares. A concordância com a regulamentação de fumar no hospital foi elevada. No entanto, foi significativamente menor em relação a restrições noutros espaços públicos fechados. Além disso, o comportamento dos médicos e as atitudes de controlo do tabaco a favor de um hospital livre de fumo e a favor dos espaços públicos livres de fumo não se correlacionaram com o seu estatuto de modelos ou "*role-models*". O principal determinante das atitudes de controlo do tabaco foi o comportamento tabágico e não ser profissional de saúde modelo, ou seja, médico ou enfermeiro.

Inquérito dos médicos conferencistas

Embora a esmagadora maioria dos médicos concordasse fortemente que o FAT é nocivo para a saúde, o conhecimento da lei de tabagismo e dos benefícios das políticas livres de FAT revelou-se limitado. A concordância com as políticas livres de FAT foi elevada nas instalações de saúde, nos edifícios da administração pública, escolas e locais de trabalho, embora fosse significativamente menor para os espaços públicos fechados de lazer, ou ainda para a regulamentação de fumar no perímetro exterior das escolas e serviços de saúde e para as restrições em locais fechados privados (casa/carro). Os fatores associados com a concordância elevada das políticas livres de fumo seguiram as mesmas tendências da população geral. O comportamento de fumar correlacionou-se fortemente com a concordância das políticas livres de fumo nos locais públicos fechados de lazer, assim como a regulamentação sobre os espaços exteriores nos serviços de saúde e voluntárias em casa e no carro. A formação específica em tabagismo não influenciou consistentemente as atitudes de controlo de tabagismo nem a concordância com as políticas livres de fumo.

Participação em atividades de controlo de tabagismo: praticas clínicas de cessação e de prevenção tabágica, formação específica e necessidades de formação em tabagismo

Inquérito aos funcionários hospitalares

Embora a maioria dos profissionais de saúde hospitalares relatasse atitudes positivas em relação com as práticas clínicas de cessação, a maior parte dos profissionais de saúde não estava envolvido na intervenção breve de cessação tabágica, não considerava necessária a formação específica em tabagismo e não tinha frequentado qualquer formação específica.

Inquérito dos médicos conferencistas

A maioria dos médicos não tinha formação específica em tabagismo e apenas uma minoria participava regularmente em atividades de prevenção ou tratamento do tabagismo. Os médicos mais jovens ou da especialidade de MGF estavam mais conscientes da necessidade de formação específica em tabagismo do que os seus colegas mais velhos, e do que os médicos hospitalares. A formação específica em tabagismo foi o preditor mais consistente da participação em atividades de prevenção e tratamento de tabagismo, seguida por ser médico de MGF. No entanto, a formação específica em tabagismo influenciou apenas alguns itens relativos às crenças e à concordância com as políticas de controlo do tabaco.

Mudança da norma social

Os resultados da investigação mostraram um envolvimento escasso dos médicos portugueses no controlo do tabagismo. Desta forma, um envolvimento escasso dos médicos estaria associado a uma mudança limitada da norma social.

A mudança da norma social foi avaliada indiretamente pelos seguintes itens:

1. *Os profissionais de saúde/médicos mais jovens relatam atitudes de controlo de tabagismo mais positivas e estão significativamente mais envolvidos no controlo de tabagismo.*

Tal não foi observado no presente estudo. A idade não foi um determinante importante das atitudes de controlo de tabagismo. Particularmente, os profissionais de saúde/médicos mais jovens não relataram uma maior concordância em relação às políticas abrangentes de proteção ao FAT.

2. *Os profissionais de saúde e os médicos relatam uma concordância elevada e consistente com as políticas abrangentes de proteção ao FAT em todos os locais.*

Mais uma vez, esta tendência não foi observada. Os profissionais de saúde e os médicos relataram uma concordância significativamente menor para as políticas abrangentes de proteção ao FAT em locais públicos fechados de lazer, no exterior das escolas e dos serviços de saúde e em locais privados fechados quando comparada com a concordância em relação às instalações dos hospitais e serviços de saúde, escolas e locais de trabalho. Em Portugal, estes locais não são ainda regulados por lei, permitindo explorar a norma social.

3. *A lei portuguesa de proibição parcial de fumar é efetivamente aplicada e cumprida num ambiente pró-tabágico.*

O inquérito de base populacional mostrou que as normas sociais em relação à proteção da exposição ao FAT sofreram uma reduzida alteração após a implementação desta proibição. Além disso, os participantes relataram um cumprimento irregular da proibição e uma baixa fiscalização, ou seja a proibição não foi efetiva neste cenário particular.

Conclusões

A prevalência de tabagismo dos profissionais de saúde e dos médicos portugueses continua a ser bastante alta. O comportamento de fumar dos médicos não difere significativamente daquele da população geral. Os profissionais de saúde e os médicos portugueses não se comportam como modelos, quer por fumarem menos, quer por estarem mais motivados para cessar de fumar, quer por cessarem de fumar mais cedo do que a população geral. Da mesma forma, os profissionais de saúde e os médicos portugueses não atuam como líderes de saúde pública no controlo de tabagismo, pois não relatam atitudes mais positivas, nem uma maior concordância com as políticas abrangentes de proteção ao fumo ambiental de tabaco do que a população geral, nem participam regularmente em atividades de controlo de tabagismo.

Em suma, os médicos e os profissionais de saúde portugueses estão pouco envolvidos no controlo do tabagismo. Por último, o escasso envolvimento dos profissionais de saúde e dos médicos portugueses está associado a uma mudança limitada da norma social em relação ao tabaco.

Implicações para a educação médica e formação pós graduada, prática clínica, gestão e política de saúde, e investigação em saúde

O escasso conhecimento e envolvimento dos médicos e profissionais de saúde no controlo de tabagismo limita fortemente a capacitação da sociedade civil e a respetiva sensibilização para as táticas da indústria do tabaco.

Neste contexto, a prevenção do consumo do tabaco e a cessação tabágica na população portuguesa está seriamente prejudicada; a mudança da norma social no sentido da diminuição da aceitação social do tabaco e de uma sociedade livre de tabaco está seriamente comprometida em Portugal.

Tais tendências evidenciam a necessidade de programas efetivos de controlo de tabagismo visando os médicos e outros profissionais de saúde, bem como os estudantes de medicina e de ciências da saúde.

Prevenir o consumo de tabaco nas faculdades de medicina e promover a cessação tabágica entre os médicos e os profissionais de saúde, além de disseminar a educação médica e continuada em controlo de tabagismo devem ser uma prioridade.

Uma estratégia nacional eficaz de promoção da saúde deve priorizar programas de controlo do tabaco abrangentes, integrados e adequadamente financiados, liderados por especialistas e envolvendo ativamente as faculdades de medicina e de ciências da saúde, as associações profissionais médicas e redes de profissionais de saúde, as sociedades científicas de saúde, os gestores e os sistemas de saúde.

A formação específica em tabagismo combinada com a mudança organizacional são fundamentais para se conseguir a mudança comportamental.

Um programa nacional de controlo de tabagismo dirigido aos profissionais de saúde e médicos deve alicerçar-se no envolvimento dos sistemas de saúde e na mudança organizacional, assim como na formação específica em tabagismo, planeada de acordo com a avaliação das necessidades.

Deste modo, os sistemas de saúde devem promover e desenvolver uma política abrangente de controlo do tabagismo, a fim de:

- promover e reforçar as políticas de proteção á exposição ao fumo de tabaco, inclusive no exterior das imediações dos edifícios, i.e. *smoke-free campus*
- monitorizar o consumo de tabaco e as atitudes de controlo de tabagismo nos profissionais de saúde
- envolver, formar e capacitar os profissionais de saúde em cessação tabágica
- implementar um sistema efetivo de aconselhamento e apoio à cessação tabágica
- envolver, formar e capacitar os profissionais de saúde em prevenção de tabagismo e ativismo de controlo de tabagismo, i.e. *advocacy*
- fortalecer a participação e a parceria com as ONG e a sociedade civil
- sensibilizar e educar a população sobre a dependência tabágica, os riscos do tabagismo e da exposição ao FAT, e os benefícios da cessação tabágica
- promover e apoiar adequadamente a cessação tabágica.

Finalmente, a *advocacy* e o ativismo de controlo de tabagismo baseiam-se tanto numa estratégia de comunicação eficaz como numa agenda de investigação robusta. Neste contexto, os padrões e as tendências do consumo de tabaco e a exposição ao fumo passivo devem ser monitorizados; bem como a efetividade e a custo-efetividade das políticas de controlo de tabagismo e o respetivo impacto na saúde da população. Como tal, é necessário construir uma rede sólida de investigadores e parcerias de colaboração eficaz entre a academia, a comunidade de saúde pública, os médicos, os gestores de saúde, as ONGs e associações de doentes e profissionais de saúde, os governos, *media*, líderes de opinião, decisores políticos, e a sociedade civil em geral.

Palavras-chave

Controlo de tabagismo, tabagismo, cessação tabágica, médicos, profissionais de saúde, hospital, congresso, inquérito, políticas de espaços livres de fumo de tabaco, fumo ambiental de tabaco, formação, educação médica e continuada, atitudes, papel de modelo, norma social.

Abstract

Introduction and aims

The tobacco epidemic continues to expand globally and remains a leading cause of morbidity and premature death. Changing the paradigm is however possible: tobacco is also the single most preventable cause of death. According to the World Health Organization (WHO), the key strategy to curb the epidemic is counteracting tobacco industry tactics by implementing tobacco control (TC) policies to regulate tobacco industry activities; raising public awareness regarding tobacco addiction and tobacco health hazards; and actively engaging civil society in tobacco control. Social norms regarding smoking and tobacco hazards change slowly over time: sustained action and leadership are needed. Healthcare professionals (HCPs), educators, policy-makers, governments, non-governmental organisations (NGOs), media and society at large should work on a strong partnership to promote TC best practices and denormalise tobacco use. Among those, HCPs have a critical role to play. All HCPs, and particularly physicians, should be TC exemplars and leaders by being role models as non-smokers; educating the general population about tobacco and second-hand tobacco smoke (SHS) hazards and the benefits of quitting; promoting cessation and systematically identifying smokers as part of their routine clinical practice; advising and supporting them to quit; and advocating for TC policies. In Portugal, smoking rates over time reported by the national health surveys and other population-wide surveys illustrate that tobacco use is high in many age groups; has recently risen among youths and is steadily rising among females in all group ages between 15 to 70 years. Moreover, few smokers express desire to quit or use cessation aids. These trends emphasize the need for a comprehensive and sustained national TC strategy. In 2012, a national TC programme was approved. This is certainly an opportunity to move tobacco control forward in Portugal. However, without appropriate funding and capacity building promoting civil society participation, the plan will not succeed. Among stakeholders, Portuguese physicians and HCPs should be non-smokers exemplars and lead TC advocacy. Nonetheless, little is known regarding smoking behaviour trends and TC engagement among Portuguese physicians.

This thesis, therefore, aimed to explore Portuguese HCPs' and, in particular, physicians' awareness of and engagement with tobacco control and its association with social norm change regarding smoking by describing their smoking behavior trends, attitudes and beliefs regarding SHS and smoke-free policies (SFPs), and participation in TC activities. In addition, factors associated with attitudes to and engagement with TC were investigated. Attitudes and beliefs to SHS and to SFPs were studied as indirect measures of smoking social norms; since those measures are strongly related with support for TC policies and social norm change towards denormalisation of tobacco use. Tobacco use and TC training were systematically explored as the main independent variables, since tobacco use and lack of training are among the major

barriers to overcome regarding HCPs' engagement in TC. It was investigated whether Portuguese physicians behave as role-models either by being non-smokers themselves and smoking less than the general population or by reporting greater motivation to quit, or quitting at an earlier age than the general population. Additionally, it was studied whether Portuguese physicians act as TC leaders, either by reporting more positive attitudes and stronger support to SFPs than the general population or other HCPs, or by actively participating in TC activities. Finally, it was assessed the association between HCPs'/physicians' engagement in TC and social norm change regarding SHS exposure.

Methods

A cross-sectional design and a quantitative survey methodology were chosen. In addition, a mixed-methods approach was used in one study. Data collection was based on the following instruments:

- self-administered questionnaires adapted from the Global Network for Tobacco Free Health Care Services questionnaire (2007) and using standardised validated survey tools
- interviewer-administered questionnaires that were based on a preliminary field work using semi-structured interviews; on-site direct observation using a check list (mixed-methods approach)

Several questionnaire-based cross-sectional studies targeting HCPs and other non-HCPs groups were carried out in different settings. Two settings were chosen to target hospital staff and physicians: a teaching hospital in Covilha and two conference-based surveys targeting physicians. In addition, a post-ban survey targeting a specific population in a pro-smoking environment explored social norm change.

The hospital survey was a pre-ban study, i.e. it was carried out before the national smoking ban came into force in January 2008. This self-administered questionnaire-based survey targeted all hospital employees, including HCPs and non-HCPs. Smoking behavior, attitudes and beliefs regarding SHS were surveyed; as well as factors associated with smoking behavior; agreement with SFPs; and disagreement with SHS exposure. In addition, attitudes to smoking cessation, self-reported cessation practices and TC training needs were surveyed among different sub-groups of HCPs.

The conference-survey was a post-ban survey conducted during two major national medical conferences targeting general practitioners (GPs), hospital-based physicians, and medical students/recent graduates, respectively:

- Portuguese Stroke Society Annual Conference - February 2009, Oporto. Self-administered questionnaires were consecutively distributed to all 450 attendees' physicians
- Portuguese GPs Society Annual Conference - March 2009, Vilamoura. Self-administered questionnaires were distributed to 500 physicians (33% systematic random sample of the total 1500 participants)

The theoretical sample size was 500 physicians assuming an expected prevalence of 22% with a 95% confidence interval (CI) and a precision of 3.6%.

This study explored Portuguese physicians' engagement in TC, by evaluating the following issues:

- attendance at TC training and awareness of training needs
- participation in TC activities
- attitudes and beliefs regarding SFPs/SHS
- support for comprehensive SFPs

The population-based survey was a mixed-methods cross-sectional study which explored the effectiveness of the Portuguese partial smoking ban and social norm change regarding SHS exposure in a pro-smoking environment targeting a specific population, specifically transportation by taxi in the city of Lisbon. This site was intentionally chosen as a "natural environment" where boundaries between private and public, regulated and non-regulated settings are blurred, allowing investigating social norm change. This was a post-ban survey carried out during January, 2009 – December, 2010. A purposive sampling was applied in selected Lisbon streets. On-site observation and structured interviews were conducted by trained researchers while using taxi services as "opportunistic natural clients". Ban effectiveness was generally defined by ban awareness and support, compliance and enforcement.

Main findings

Participation rate was 52.9% among hospital staff, 64.0% among physicians and 98.8% among taxi drivers.

Smoking behavior trends

Hospital staff survey

Of the hospital staff, 589 participated in the survey: of those, 65.9% were females; mean age was 38.3 ± 9.9 years (20↔68). Smoking prevalence among hospital staff was 40.5% (95% CI: 33.6-47.4) in males, 23.5% (95% CI: 19.2-27.8) in females ($p < 0.001$); 43.2% in auxiliaries, 26.1% in nurses, 18.9% among physicians, and 34.7% among other non-health professionals ($p = 0.024$). Participation rate was significantly lower among physicians (30.8%). Although most smokers wanted to quit, only few reported readiness to quit. Smoking in hospital premises, as well as in indoor private settings, was common practice.

Physicians' survey

In total, 608 physicians participated in the survey: 58.4% GPs; 32.4% hospital-based physicians and 9.2% medical students/recent graduates; 62.7% were females; mean age was 39.1±12.9 years (21↔70).

Smoking prevalence was 29.1% in males (95% CI: 23.2-35.0); 16.0% in females (95% CI: 12.3-19.7), $p<0.001$. The great majority of younger physicians reported being never smokers, independently of gender, in contrast to their elders. Of the smokers, 51.2% reported smoking daily; 30.7% reported willingness to quit. Current smoking was not influenced by speciality, i.e. GPs reported similar smoking rates than hospital-based physicians. When compared with a random sample of the Portuguese population matched for gender/age/education, similar smoking rates were reported among male physicians, despite lower quitting rates and later quitting; female physicians reported smoking less and similar quitting rates and age-quitting trends. Half of the ever-smoking physicians, independently of their age group, declared establishing regular smoking during medical school. In addition, most physicians, including students, reported lack of cessation support in their workplaces. Younger physicians reported more occasional smoking than the general population, independently of gender, suggesting an emergent consumption pattern. However, occasional smoking was significantly associated with lower motivation to quit.

Tobacco control attitudes and support for smoke-free policies

Hospital staff survey

Most staff reported passive behavior regarding SHS exposure assertiveness; i.e. they admitted not complaining about SHS exposure, despite that most perceived high exposure in hospital premises. Agreement with hospital smoke-free policy was high, but significantly lower regarding bans in other indoor public spaces. Furthermore, physicians' TC behavior and attitudes to a smoke-free hospital and to the national smoking ban did not correlate with their status as "role-models". Smoking behavior was the main determinant of TC attitudes, not being role-models HCPs, i.e. physicians or nurses.

Physicians' survey

While the overwhelming majority of physicians strongly agreed that SHS is harmful, awareness of SFP benefits and the TC law was restricted. Support for SFPs was high in healthcare premises, public administration buildings, schools and workplaces, but significantly lower for indoor leisure settings, outdoors bans in healthcare/schools settings and smoking restrictions in the home/car. Factors associated with strong support for smoke-free policies followed the same trends as the general population. Smoking behaviour strongly predicted support for smoke-free regulations in indoor leisure and private settings, and healthcare outdoors. TC training influenced few items regarding SFP support and SHS/SFP beliefs.

Participation in tobacco control activities: cessation and tobacco control practices, training attendance and training awareness

Hospital staff survey

Although the great majority of hospital-based HCPs have reported positive attitudes to cessation, most of the hospital framework was not involved in cessation brief intervention, lacked specific training and were not aware of training needs.

Physicians' survey

Most physicians lacked specific training and only a minority participated regularly in smoking prevention or cessation activities. Younger physicians and GPs were more aware of TC training needs than respectively the older ones and hospital-based physicians. Training was the most consistent predictor of participation in TC activities, followed by being a GP. Nevertheless, training influenced few items in SFP support and SHS/SFP beliefs.

Social norm change

The research findings show poor engagement of Portuguese physicians in TC. Likewise, poor TC awareness by HCPs/physicians would be associated with limited change regarding social smoking norm.

Social norm change regarding smoking is indirectly assessed by the following:

1. *Younger HCPs/physicians report the most positive TC attitudes and are significantly more engaged in TC.*

This was not observed in this study. Age was not a main predictor of TC attitudes. Particularly, younger HCPs/physicians failed to report stronger support for comprehensive SFP.

2. *HCPs and physicians report consistent high support for SFPs in all settings.*

Again, this trend was not observed. HCPs and physicians reported significantly lower support for comprehensive SFPs in indoor leisure and private settings and outdoors when compared to indoor hospital, schools and workplaces. In Portugal, those settings are not regulated by law, allowing exploring the social norm.

3. *The Portuguese smoking ban is effective in a pro-smoking environment.*

The post-ban survey showed that social smoking norms suffered little change after the ban implementation. In addition, participants reported poor enforcement off and patchy compliance with the ban, i.e. the ban was not effective on this particular setting.

Conclusions

Tobacco use among Portuguese healthcare professionals and physicians remains rather high. Physicians' smoking behaviour does not significantly differ from that of the general population. Portuguese HCPs/physicians do not behave as role-models either by being non-smokers and smoking less, or by reporting greater motivation to quit, or by quitting at an earlier age than the general population. Similarly, Portuguese HCPs/physicians do not act as TC leaders, either by reporting more positive attitudes and strongly supporting SFPs, or by actively participating in TC activities.

In sum, Portuguese physicians/HCPs are neither aware of nor engaged in tobacco control. Finally, poor TC engagement of HCPs/physicians is associated with restricted change regarding smoking social norms.

Implications for medical and continuing education, healthcare practice, policy and research

Limited physicians'/HCPs' engagement in TC greatly restricts capacity building in tobacco control, as well as undermines the awareness of tobacco industry tactics. Likewise, prevention of tobacco use and tobacco cessation among the Portuguese population is undermined; social norm change towards tobacco denormalisation and a tobacco-free society is seriously compromised in Portugal.

These trends highlight the need for comprehensive tobacco control programmes targeting physicians and other HCPs, as well as medical and health science students. Preventing tobacco use in medical schools, promoting cessation among HCPs/physicians and disseminating medical and continuing education in TC should be made top priorities.

An effective national health promotion strategy should prioritise comprehensive and adequately-funded TC programmes led by experts and actively engaging medical/health sciences schools, medical associations and HCPs' networks/societies, hospital managers and healthcare systems.

Continuing education combined with system changes can provide the grounding for behavior change. Health systems' engagement and organisational change, as well as training based on assessed needs, should be the core components of a TC national programme targeting HCPs and physicians.

Health systems should foster and develop a comprehensive TC policy, in order to:

- promote and enforce SFPs, including hospital/university smoke-free campus
- Monitor tobacco use and TC attitudes among HCPs
- implement a system-delivery of systematic cessation advice and support
- engage and train HCPs with brief cessation intervention
- engage and train HCPs with smoking prevention, capacity building and TC advocacy
- strengthen participation and partnership with NGOs and civil society
- raise public awareness regarding tobacco addiction, tobacco and SHS hazards, and the benefits of tobacco cessation
- promote and adequately support smoking cessation

Finally, effective TC advocacy relies on both a strong communication strategy and a strong research agenda. Particularly, patterns and trends of tobacco use and exposure to SHS should be monitored; as well as the effectiveness and cost-effectiveness of TC policies and their impact on population health. Therefore, there is a need to build a strong network of TC researchers and build effective collaboration partnerships among academics, the public health community, clinicians, healthcare managers, NGOs, patients' and HCPs' associations, the media, opinion makers, decision-makers, governments and the civil society as large.

Keywords

Tobacco control, smoking, smoking cessation, physicians, healthcare professionals, hospital survey, conference survey, smoke-free policies, second-hand tobacco smoke (SHS), training, medical and continuing education, attitudes, role-models, social norm.

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List of acronyms

CI: Confidence intervals

CHCB: Centro Hospitalar da Cova da Beira

CT: Controlo de tabagismo

DALYs: Disability Adjusted Life years

EU: European Union

FAT: Fumo ambiental de tabaco

GPs: General practitioners

HCPs: Healthcare professionals

IC: Intervalo de confiança

MGF: Medicina Geral e Familiar

NGOs: Non-governmental organisations

NSH: national health survey

ONGs: Organizações Não Governamentais

SHS: Second-hand tobacco smoke

SFPs: Smoke-free policies

TC: Tobacco control

UK: United Kingdom

US: United States of America

WHO: World Health Organization

WHO-FCTC: WHO-Framework Convention on Tobacco Control

Chapter 1
Introduction

Introduction

1.1 Tobacco as a global health and social threat

Tobacco causes an immense worldwide health burden, killing nearly 6 million people each year, including more than 600.000 who had been exposed to second-hand smoke (SHS); it devastates economies by significantly increasing health-care costs and reducing productivity.[1-3]

Globally, in 2004, it was estimated that tobacco was responsible for one in seven deaths in men and one in fifteen in women.[3] More recently, following 50 years of a comprehensive national tobacco control (TC) strategy, gender mortality trends over time have been reviewed in the United States of America (US). The rate of death from all causes was three times higher in smokers than in non-smokers; life expectancy was shortened on average at least 10 years in smokers, irrespective of gender.[4,5]

Between 1959 and 2010, lung cancer risk for US smokers increased dramatically: it doubled among male smokers and rose ten-fold among female smokers. Similarly, the chronic obstructive pulmonary disease risk for smokers has risen significantly. Contrastingly, the risk for lung cancer among never smokers remained unchanged.[5] This study concludes that cigarette smoking remains the biggest health hazard for both genders, despite the decrease of smoking rates and the fact that most smokers have smoked fewer cigarettes with lower tar levels than in earlier decades. In fact, several studies confirm that although smoking rates have steadily declined over time in the US, smokers' health risks attributable to tobacco use have not.[5,6]

A recent comprehensive study analysed smoking trends in 187 countries from 1980 to 2012. Study outcomes were: 1) estimated modelled age-standardised prevalence of daily cigarette smoking by age, sex, country, and year; 2) cigarettes per smoker per day by country and year. The authors observed significant and global reductions in the estimated prevalence of daily smoking for both genders. Nevertheless, this downward trend has slowed down since 2006. Cigarette consumption per smoker per day ranged widely among countries and was not correlated with national smoking prevalence. Despite the decrease in daily smoking prevalence, the number of smokers increased significantly due to population growth.[7] Moreover, while tobacco use is steadily, but slowly, decreasing in several high-income countries, it is rising in many low- and middle-income countries.[1,6,7]

Furthermore, the tobacco industry continues to introduce and aggressively market new products that promote nicotine addiction. These emergent products such as roll-your-own tobacco, slim and long cigarettes; menthol and other flavored tobacco products; smokeless tobacco and water-pipe; as well as tobacco-free nicotine devices (electronic cigarette, e-cigarette) are quickly spreading and consumers, in particular younger smokers, often use

multiple products. These new products mislead consumers about their safe use, attract more users, recruit non-smokers and postpone quitting in regular smokers while promoting the social acceptability of smoking. As a result, the global market for tobacco products continues to grow and the epidemic remains persistent.[1,6,8]

Tobacco consumption affects the entire body. Consequently, tobacco is a major cause and/or an aggravating factor of many diseases, including cancers, respiratory and cardiovascular diseases, stroke, diabetes, tuberculosis, pneumonia and other respiratory infections. Additionally, tobacco affects reproductive and sexual health, ocular and oral health; jeopardises immune function, and causes inflammation and autoimmune disease. It should also be emphasised that tobacco has a huge negative impact on foetal development and the health of children.[6,9,10] In summary, this explains why tobacco is the second biggest cause of death in the world and the fourth most common risk factor for disease worldwide.[1]

Smoking is not an adult choice or a lifestyle, but a childhood or youth addiction and a chronic disease. Children, teens and young adults are highly exposed to tobacco imagery through the tobacco industry's marketing. More than two thirds of smokers experiment, uptake smoking and become addicted in their teenage years.[11]

Nicotine is the primary substance responsible for tobacco addition, the impact being greatly enhanced by the addition of other chemicals to tobacco products. Tobacco addiction is a highly engineered process. Modern tobacco manufacturing enhances nicotine to reach the brain faster. Filters and ventilation holes in most modern cigarettes design and additives such as menthol lessen tobacco smoke's harshness thereby encouraging smokers to inhale more deeply. Deep inhalation increases the risk of tobacco-related disease and nicotine addiction.[6]

Due to nicotine addiction, most smokers postpone quitting, and do not seek treatment or professional support. This significantly hinders the success of smoking cessation attempts.[12] Half of those who do not manage to quit successfully die prematurely due to this deadly behavior while those who survive longer will also suffer from one or more tobacco-related diseases mentioned above.[13] On the other hand, SHS exposure is associated or causes most diseases of active consumption, and is a major child health hazard.[6,10,14]

All forms of tobacco use are harmful and any exposure to SHS can damage the body in the short term and over the long-term. There is no safe level of SHS exposure[14]; and there is no safe tobacco product.[13] To reduce tobacco hazards cessation of tobacco use and full protection against SHS exposure are the only proven strategies.[6,10,14]

Lastly, it should be emphasised that tobacco is particularly harmful to the more vulnerable populations. It also undermines economic and social welfare in general. Tobacco use is more prevalent and quitting is more difficult among the poor, the unemployed and underprivileged, among families that have trouble making ends meet; among those with mental illness and substance use disorders; and among ethnic and sexual minorities. In addition, tobacco industry's marketing targets children, teenagers and women, lower socio-economic and less educated groups, and the socially disadvantaged. Finally, the illness and disability caused by tobacco often triggers a downward spiral into poverty. At the national level, countries and families suffer dramatic economic losses as a result of tobacco purchase and huge health-care costs, as well as reduced productivity due to tobacco-related disease and premature deaths. Given the current financial crisis, tobacco control is essential to health promotion and disease prevention, but also to improve social well-being and the wealth of nations.[6,11,15,16]

1.2 Controlling the tobacco epidemic: changing the paradigm and the social norm

As previously pointed out, the burden of death and disease attributable to tobacco is overwhelming. Changing the paradigm is however possible: tobacco is also the single most preventable cause of death.[1]

The globalisation of tobacco use is caused by the tobacco industry activities, including:

- targeted marketing to children and youths resulting in increased likelihood of tobacco experimentation
- design and marketing of highly addictive nicotine products
- consumer deception as to the health risks and addictiveness of tobacco products[6,11]

WHO claims that the tobacco industry is the vector of the tobacco epidemic. Hence, the key strategy to curb the epidemic is to counteract tobacco industry tactics by:

- enacting and enforcing legislation to regulate tobacco industry activities
- raising public awareness regarding tobacco addiction and tobacco health hazards
- actively engaging civil society in tobacco control[17]

Full implementation of TC policies, as part of a sustained, comprehensive and appropriately-funded program, can reduce tobacco use and tobacco-related disease and death.[6] These strategies are outlined in the WHO-Framework Convention on Tobacco Control (WHO-FCTC). They are evidence-based and follow TC practices from countries that have made major improvements.[6]

These policies include:

- monitoring tobacco use and prevention policies
- implementing and enforcing 100% smoke-free policies in public settings
- raising awareness on tobacco addiction and tobacco hazards through public health media campaigns
- promoting smoking cessation and access to cessation treatment
- enforcing bans on tobacco advertisement, promotion and sponsorship
- regulating tobacco products and controlling illicit trade
- raising taxes on and price of tobacco products[1,18]

Moreover, TC policies are relatively inexpensive and feasible to implement and very cost-effective. Effective tobacco taxation increases governments' revenues and warrants the funding for a national tobacco control programme, while is highly effective to reduce tobacco use.[1,18]

Social norms regarding smoking and tobacco hazards change slowly over time: sustained action and leadership are needed. Several countries such as Australia, Canada, Finland, Ireland, New Zealand, United Kingdom, Uruguay and the US have led the way in tobacco control by implementing and enforcing comprehensive TC policies. These policies steadily decrease tobacco use, while changing social norms over time and making smoking less acceptable.[1,6] Implementing TC policies requires strong public support.[1,6] Amongst TC policies, smoke-free regulations are strongly associated with tobacco social norms and support for tobacco control.[6,19] In fact, in countries such as the US that have implemented 100% SFPs, the social movement upon protection of non-smokers from SHS has consistently led to changes in social norms towards a smoke-free society.[6] Only 100% SFPs protect all citizens from SHS, including the more vulnerable such as children and low socio-economic groups. Comprehensive SFPs also prevent smoking initiation and promote smoking cessation, making smoking less visible and eliminating social smoking cues.[1,6]

The final result is that they "denormalise" smoking and undermine tobacco use.[6] In the same way, casting the spotlight on the tobacco industry's role as the vector of the epidemic and exposing its tactics help to denormalise tobacco use and advance the tobacco control agenda.[20,21] Likewise, raising civil society's awareness of the susceptibility of children and youths to tobacco imagery, including adult smoking visibility and SHS exposure in private and public settings is also an important strategy.[11,22]

1.3 Tobacco control overview in Portugal. The role of healthcare professionals in tobacco control

In Portugal, Borges *et al*. have estimated that in 2005 tobacco caused 12.600 deaths (11.7% of all causes mortality) and 11.2% of overall disease burden. Regarding tobacco-related disease burden and mortality, gender disparities were observed being higher in males: 15.4% of disease burden and 17.7% of all male deaths; while among females tobacco caused 4.9% of disease burden and 5.2% of all deaths.[23]

In 2010, gender mortality trends were updated for Portugal. Tobacco use was responsible for 11000 deaths among smokers or former smokers (10.3% of the total deaths). Of these deaths, 83.2% were registered in males. In addition, the estimate for mortality attributable to SHS was 845 deaths: 373 males and 472 females (8 in 1000 deaths). Tobacco consumption in Portugal accounted for 12.3% of the total Disability Adjusted Life years (DALYs) among males and 3.1% among females. The highest loss of healthy life years attributable to smoking was observed for males (age group 15 to 69 years): 18.3% of the total DALYs.[24]

Mortality from lung cancer is the most reliable indicator of tobacco-attributable mortality,[13] reflecting the stage of the tobacco epidemic. Table 1 (page 8) depicts mortality rates by gender and age for lung cancer (trachea/bronchus/lung cancer) in Portugal (2008-2012). [25]

Since 1987, several cross-sectional surveys have assessed tobacco consumption in the Portuguese general population. However, different methodologies regarding both sampling procedures and survey tools have been applied. On the other hand, these surveys did not follow WHO guidelines[1], i.e. did not use WHO standardised questionnaires, therefore limiting accurate comparisons with other countries. This also undermines the accurate monitoring of the tobacco epidemic in Portugal. Despite these limitations, we present in table 2 (page 9) the evolution of tobacco consumption in Portugal by gender and age group over the last three decades.

According to the last national health survey (NHS) conducted in 2005/6, Portugal had one of the lowest crude smoking prevalence rates in Europe (20.9%, being 30.9% for males and 11.8% for females). It also had one of the highest never-smoking rates in Europe. Nevertheless, age-gender specific prevalence was high in several age groups,[26,27] illustrating the limitations of crude rates and the need for appropriate epidemiological measures (standardised rates/age gender-specific rates) when analyzing trends over time.[28,29] Calheiros[28] has recently updated smoking rates trends over time reported by the several NHS and recent population-wide surveys.

Table 1: Specific mortality rates from cancer of the trachea, bronchus and lung, in Portugal (2008-2012).

Males	**2008**	**2009**	**2010**	**2011**	**2012**
Number of deaths	2469	2543	2727	2730	2672
Mortality rate / 100 000	51.2	52.8	56.7	56.9	56.1
SMR*	40.0	40.6	42.7	42.1	40.8
SMR (<65)	20.1	20.8	21.3	21.3	20.5
SMR (≥65)	201.2	200.7	216.5	210.2	205.4

Females	**2008**	**2009**	**2010**	**2011**	**2012**
Number of deaths	661	698	716	784	774
Mortality rate / 100 000	12.6	13.3	13.6	14.9	14.8
SMR	8.0	8.7	8.3	9.2	8.9
SMR (<65)	4.2	5.3	4.1	5.4	5.0
SMR (≥65)	38.9	36.0	41.9	39.3	40.7

*Standardised mortality rate (SMR). Mortality rates by 100 000 habitants. Codes from the 10th International Classification of Diseases (ICD-10): C33-34. Sources: National Institute of Statistics, Portugal. Adapted from: Directorate of Health, 2014.[24]

Despite the above limitations the following evolution is clear:

- tobacco use has recently increased among young males (15 to 34 years); remains stable, although high, among 35-54 male age-groups; decreased in males >55 years
- smoking rates are dramatically rising among females in all age groups between 15 and 70 years
- prevalence among young adults is high

Furthermore, a recent systematic review has analysed smoking prevalence over time by age, gender and birth cohorts using linear regression models to assess differences in prevalence estimates according to the type of population sampled and to estimate time trends concerning nationally representative surveys of the general population. These authors report that between 1987 and 2008, smoking rates have dramatically raised among women aged ≤ 70 years and in all birth cohorts, except for those born before 1926; the steepest increase was observed in those aged 31–50 and 51–70 years. By contrast, smoking rates decreased among males in all age-groups and of all birth cohorts, with the steepest declines in those aged ≤ 30 years and those aged ≥ 71 years.[34]

Table 2. Smoking prevalence trends in Portugal by gender and age group (1987-2012)

Age group[1]	NHS_1	NHS_2	NHS_3	NHS_4	$SICAD_1$	$SICAD_2$	$SICAD_3$	$SICAD_3/NSH_1$
Females	**1987**	**1994/95**	**1998/99**	**2005/06**	**2001[2]**	**2007[2]**	**2012[2]**	**2012/1987**
15-24	10.3	10.4	10.5	16.1	24.0	27.3	22.9	2,2
25-34	12.3	17,2	19.6	17.6	28.6	28.2	25.9	2.1
35-44	6.3	1.2	15.0	21.2	20.2	23.7	25.5	4.1
45-54	2.4	4.1	6.1	12.6	8.0	16.0	17.1	7.1
55-64	1.0	1.1	2.2	5.7	2.5	3.7	7.5	7.5
65-74	0.5	0.6	0.7	1.5	ND	ND	ND	ND
75-84	0.2	0.6	0.6	0.2	ND	ND	ND	ND
85+	0.3	0.2	0.2	0.0	ND	ND	ND	ND
Males	**1987**	**1994/95**	**1998/99**	**2005/06**	**2001[2]**	**2007[2]**	**2012[2]**	**2012/1987**
15-24	30.7	26.6	25.8	31.4	34.9	38.5	33.5	1.1
25-34	53.0	48.7	47.1	39.0	49.8	50.1	49.0	0.9
35-44	41.3	41.8	44.5	44.6	46.5	49.0	43.0	1.0
45-54	32.2	31.6	31.6	34.0	39.1	41.4	32.7	1.0
55-64	28.1	21.2	22.0	21.3	26.3	23.8	23.5	0.8
65-74	20.1	15.5	14.6	12.7	ND	ND	ND	ND
75-84	17.7	9.4	8.0	7.8	ND	ND	ND	ND
85+	15.9	6.4	5.2	0.1	ND	ND	ND	ND

ND: no data; NHS: National health survey. SICAD: National Health Service on Addictive Behaviours and Substance use; [1]Age group in years; [2]tobacco use during the last 12 months. Source: NHS 1987;[30] NHS 1994/95;[31] NHS 1998/99;[32] NHS 2005/06;[26] SICAD 2001/2007/2012.[33] Adapted from Calheiros, 2015.[28]

Another concern is that recent studies have pointed to rising smoking rates among youth in both genders, reversing the significant decline observed between 2001 and 2007.[35] In 2011, 39% of boys and 38% of girls of the 3rd schooling cycle (7th-9th schooling grade) smoked cigarettes: 28% reported consumption in the last 12 months and 18% in the last 30 days.[35]

In Portugal, most of the smokers consume boxed cigarettes (96%).[36] Nevertheless, the consumption of roll-your-own tobacco has substantially increased (11%), whereas the regular use of other tobacco products remain stable (1% cigars or pipe; 2% cigarillos; 0% water pipe or oral/nasal tobacco).[36] Although the regular use of water pipe is residual, experimentation of this product has increased (5%), especially among young people.[36] In addition, emerging consumption of electronic cigarettes should be highlighted: 6% have tried it, half of which

progressed to regular consumption: 2/3 continued to use it and 1/3 ceased. In 2014, 2% of the Portuguese consumed these products.[16,36]

The evolution of tobacco use among European countries depicted in several cross-sectional Eurobarometer surveys from 2002 to 2014 illustrates that the overall smoking prevalence is not steadily decreasing in Portugal and has increased since 2012, in contrast with the great majority of other European countries that show a consistent downward trend.[16,27,36,37] Notably, in 2002 Portugal was the EU country with fewer current smokers (29.0%), ranking 15th among the 15 EU countries,[37] while in 2014 Portugal ranks 17th among the 28 EU countries, in terms of smoking prevalence (25.0%).[36] By contrast, in 2002 the United Kingdom (UK) ranked first among the 15 EU countries (45.2% of current smokers),[37] while in 2014 the UK ranks 22th among the 28 countries (22% of current smokers).[36] Similarly, smoking prevalence has significantly declined in Spain: from 40%, ranking sixty among the 15 EU countries in 2002,[37] to 29% in 2015, ranking 9th among the 28 EU countries.[36] In the same period, smoking prevalence among the EU countries declined from 39.4% in 2002[37] to 26.0% in 2014.[36] Furthermore, although the changes in overall prevalence can be influenced by the cohort effect,[33] gender specific-age trends over time clearly illustrate that tobacco consumption remains high in many age groups in Portugal.

These trends emphasize the need for a comprehensive, sustained and enforced national TC strategy. In 2012, a national TC programme was approved. This is certainly an opportunity to move tobacco control forward in Portugal. Nevertheless, without appropriate funding and capacity building promoting civil society participation, the plan is likely not to succeed.

Healthcare professionals (HCPs), educators, policy-makers, governments, non-governmental organisations (NGOs), media and society at large should work on a strong partnership to promote TC best practices and denormalise tobacco use. Among those stakeholders, HCPs have a critical role to play.[38,39]

All HCPs, and specially physicians, should be TC exemplars and leaders by:

- being role models as non-smokers
- educating the general population about tobacco hazards, the benefits of quitting and promoting cessation
- educating the general population on the health consequences of SHS and the benefits of 100% SFPs
- systematically identifying smokers as part of their routine clinical practice and advising and supporting them to quit
- advocating for TC policies, both individually and through their professional associations[38-41]

Given this context, the role of HCPs and its organizations has been clearly emphasised by the WHO. Among HCPs, tobacco control goals should discourage tobacco use, disseminate evidence-based training and promote smoke-free environments and other TC evidence-based interventions.[39]

Nevertheless, much remains to be done to engage HCPs and to make them accept that tobacco control is a core component of HCPs' clinical and public health practice. Particularly, tobacco use among HCPs and lack of training in tobacco control are major barriers to overcome.[39,40,42] Physicians should lead the way as public health exemplars towards tobacco control progress. In fact, the TC movement and denormalisation of smoking are stronger in countries where few physicians smoke and their engagement in tobacco control is remarkable.[39-41]

In recent decades, the worldwide rate of smoking among HCPs and especially among physicians has significantly declined. In most developed countries, few physicians take up smoking and many quit, resulting in higher quitting rates than for the general population.[42] In some countries, including southern Europe, this downward trend is observed mainly among males and to a lesser extent among females. Additionally, in several developed and in developing countries, including eastern, central and southern Europe, physicians smoking rates remain high, or even higher than the general population.[42-49]

Several authors underscore that tobacco use among HCPs and physicians, still is a major public health concern, undermining their active participation in smoking cessation and tobacco control. On the other hand, national TC policies also influence physicians' tobacco use.[41,49] Worldwide, and following WHO guidelines,[38,39] surveys evaluating tobacco use among HCPs/physicians and their attitudes to tobacco control have been carried out. However, it is difficult to survey physicians, since collaboration is often rather poor.[50,51] In addition, few studies compared physicians' smoking behaviour with the general population by gender, age and education.

In 2006, Fraga *et al*[45] have published a comprehensive overview on tobacco control in Portugal. The authors highlight the high smoking prevalence among role-model professions such as HCPs (physicians and nurses) and teachers; emphasising the need to monitor and reduce tobacco use among these populations.[45]

Monitoring the prevalence of tobacco use among physicians is important because this trend mirrors the "maturity stage" of the tobacco epidemic at a national level.[52] Secondly, if smoking rates among physicians are high this will undermine the impact of health campaigns and advocacy efforts to raise awareness on tobacco health hazards.[53] In fact, as stated by Davis,[53,p187] "How bad could smoking be, people will ask, if so many doctors smoke". Furthermore, physicians' engagement and leadership in tobacco control will be rather limited.[39] According to Kunze,[52] physicians' tobacco use is an important TC indicator that assesses the

maturity of the smoking epidemic. Based on this assumption, Kunze has developed a two-phase model of the maturity of a country's smoking epidemic. In phase one, physicians uptake smoking earlier than the general population and present higher smoking rates due to their higher socio-economic status and higher purchasing power. During this immature phase of the smoking epidemic the ratio of smoking prevalence among physicians to the prevalence in the general population ("Kunze ratio") is higher than one. Following the public awareness of tobacco hazards, physicians, who are in turn more knowledgeable, show higher quitting rates and lower uptake of smoking than the general population. Consequently, the Kunze ratio is less than one. At this stage the country's smoking epidemic is considered to be mature.[52]

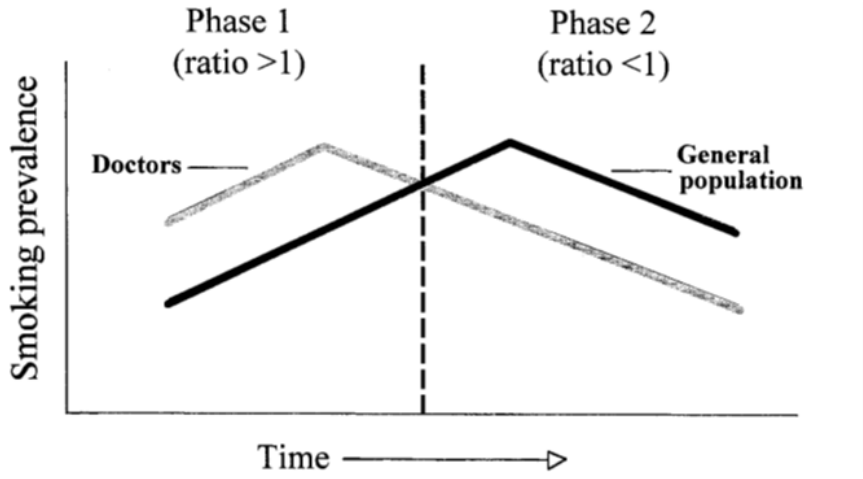

Figure 1. Kunze model of the maturity of a country's smoking epidemic. Ratio refers to Kunze ratio, i.e. the ratio of smoking prevalence among physicians to the prevalence in the general population. Source: Adapted from Michael Kunze.[52]

Notably, the Kunze model was the first theoretical explanation of the tobacco epidemic's dynamics. Around 1990, the Kunze ratio for Portugal was estimated from WHO data regarding general practitioners' (GPs) smoking prevalence[54] and general population prevalence reported by the NHS,[30] respectively 39/27=1.44. However, smoking rates were not matched by gender, age and education. Thus, this limitation should be emphasised since it does not provide age-gender specific smoking rates.

Later on, in 1994, Lopez *et al*[55] proposed a four-stage model of the tobacco epidemic based on the evolution of both tobacco use and tobacco-attributable mortality in economically developed countries. These authors have matched trends in smoking prevalence and deaths from smoking for both genders. Since duration of smoking behavior is a main determinant of

health hazards, deaths from smoking increase with a time gap from smoking prevalence. This means that even sharp declines in smoking will not be matched by reductions in smoking-attributable mortality for many years.[55] Recently, the same authors proposed a different approach based on independent gender-specific models and stressing the long delay between the widespread uptake of cigarette smoking and its full impact on mortality.[56] Public health community and decision makers should be aware of this 30-40 years gap between consumption prevalence peaks and disease burden/mortality peaks; that mortality time trends are projected forward, while not relying on the relatively low tobacco-attributable mortality that occurs in the first stages of the epidemic. Furthermore, countries in the earlier stages of the epidemic should implement comprehensive TC policies the sooner the better in order to effectively reduce tobacco use and prevent tobacco-related death and disease both among current and future generations.

Relative to the tobacco epidemic model, Portugal has, for many decades, been well down the scale due to cultural and socioeconomic determinants that prevented smoking uptake among lower socio-economic groups and females, preserving an overall smoking prevalence lower than most European countries.[45] This situation has, however, changed, as already aforementioned. Currently, according to smoking prevalence and tobacco-related mortality trends, Portuguese women reached phase II of the tobacco epidemic while Portuguese males remain between phase III and IV.[34,57] Consequently to this gender gap, prevalence is steadily rising in Portuguese females and their tobacco-attributable mortality is also rapidly increasing, although it is still low, substantially lower than the expected peak. By contrast, smoking prevalence among Portuguese males is decreasing, and their tobacco-attributable mortality has stabilised.[34,56,57]

Figures 2 and 3 (see pages 14,15) compare lung cancer mortality trends in Portugal with Spain, the United Kingdom and the European Union (EU).

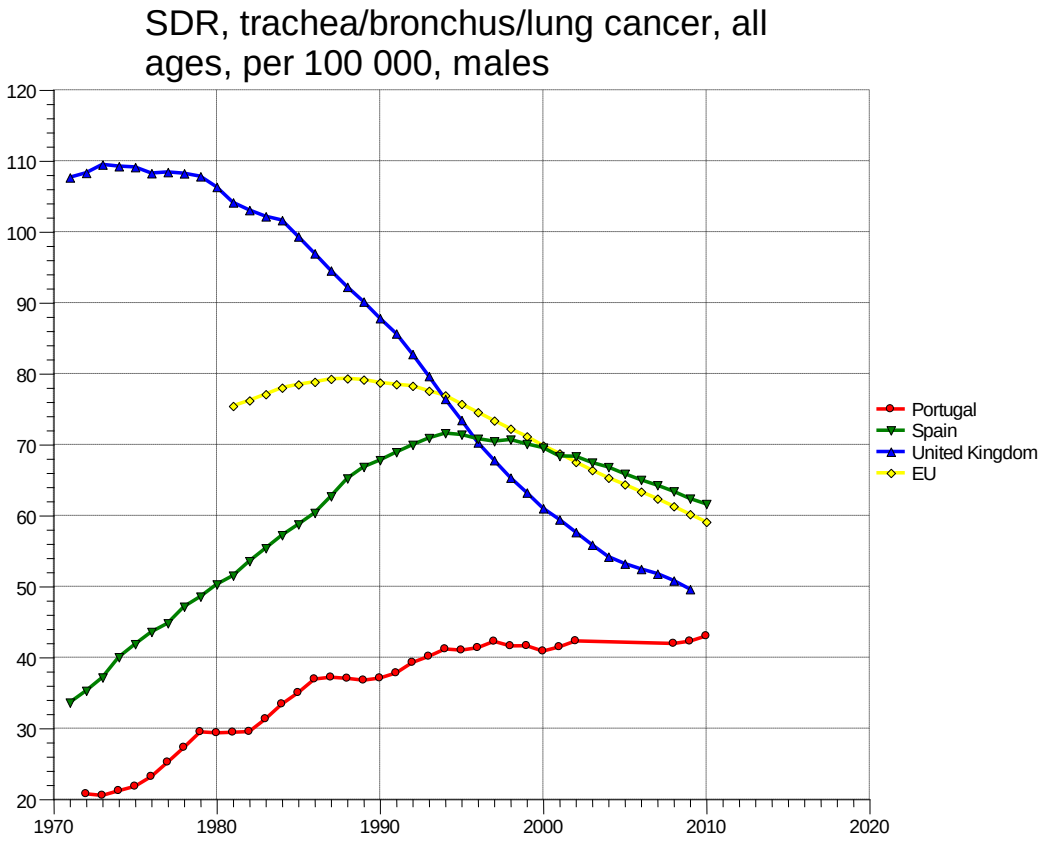

Figure 2. Standardised death rates from lung cancer, all ages, per 100.000 males, in Portugal, Spain, UK and the EU (1970-2010). Note: three year moving average. SDR: Standardised death rates. Source: European Health for All database.[58]

The UK was one of the first countries where tobacco use reached epidemic proportions, achieving dramatic consumption levels in both genders, despite that women uptake smoking to a lesser extent and lagging behind men.[55,56,59] In 1959, over 70% of men and 40% of women in the UK were smokers.[59] The analysis of these mortality trends for countries in different stages of the tobacco epidemic show a sharp reduction among males in the UK, while, in 2010, mortality among females had not yet began to decline significantly. Portugal is the country where the tobacco epidemic is more recent, what explains the lower mortality in both genders. However, when comparing with Spain, mortality rates among females are similar to Portugal, since females have uptake smoking later than males in both countries, and their tobacco-atributable mortality has not yet raised sigficantly; whereas males mortality rates in Spain are higher than in Portugal, and show a steadily decline in the former country.

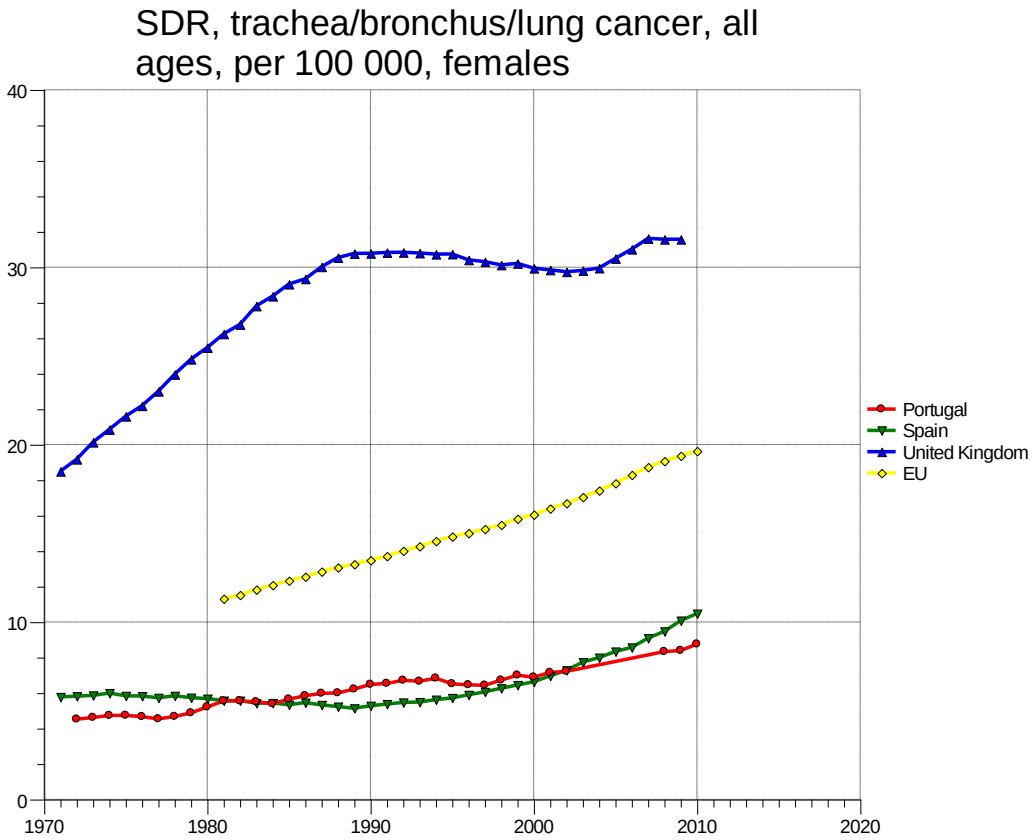

Figure 3. Standardised mortality rates from lung cancer, all ages, per 100.000 females, in Portugal, Spain, UK and the EU (1970-2010). Note: three year moving average. SDR: Standardised death rates. Source: European Health for All database.[58]

In Portugal, following the ratification of the WHO-Framework Convention on Tobacco Control (WHO-FCTC) in 2005, and the tobacco control law of 14th August 2007, HCPs' training and involvement in smoking cessation has spanned to different settings.[60] In particular, GPs and respiratory physicians have shown greater commitment to smoking cessation. While many HCPs are motivated to work in smoking prevention and cessation, implementation of smoking cessation services and community-based prevention programmes is poor; smoking cessation resources are not effectively used and interaction between the different settings and services is limited.[60] Furthermore, most smokers are low motivated to quit or quit unaided and not using medication.[16,33,36]

On the other hand, training in TC policy and advocacy building is seldom included in HCPs' training programmes.[60] Lastly, it should be emphasised that the Portuguese Medical Association has neither an official policy on tobacco use or tobacco control. In addition, TC advocacy is led by a handful of underfunded NGOs and HCPs associations. To date, these NGOs have, however, not succeeded to improve tobacco control in Portugal.[61] The "Tobacco Control Scale in Europe", which measures and compares policy implementation among European countries, has been recently updated and classifies Portugal as one of the 10 countries with lowest TC activity.[62] In

addition, tobacco control research in Portugal is rather scarce.[45,63] One of the best advocacy tools is health impact assessment and the awareness of tobacco industry tactics.[17,20] In Portugal, TC research gaps concerns not only the evaluation of policies and its impact on population health, but also the role of the tobacco industry as a vector and its interference on public health decision making. Limited knowledge on these topics undermines tobacco control capacity building in Portugal.

Similarly, studies evaluating smoking behaviour among Portuguese HCPs/physicians are scarce and have applied different methodologies in different settings. Although past research has reported good response rates,[64] this is not the case in the majority of surveys. Most surveys have used convenience local samples and consistently report low response rates, ranging from 7.5% to usually less than 35%.[65-68] Studies from the 1970s to the 1990s showed high prevalence rates, indeed higher than for the general population.[45,54,69,70] Several studies report that tobacco use among Portuguese physicians has gradually declined over the past 30 years from 67.0% (1975)[69] to 44.0% (1988)[69]; 35.0% (41.0% males; 30.0% females) in 1994[64], to 22.0% (26.0% males; 19.0% females) in 2000.[71] It is not, however, clear whether Portuguese physicians are smoking less than the general population, nor whether this downward trend is a sustained one. Little is known regarding smoking behaviour patterns and tobacco control awareness among Portuguese physicians. This thesis, therefore, addresses the general research question:

- Are Portuguese healthcare professionals, in particularly physicians, aware of their role in tobacco control?

Chapter 2

This thesis

This thesis

2.1 Research scope, target population, research question and main purpose; assumptions, specific aims and research hypotheses

The scope of this thesis conducted in Portugal is tobacco control, the role of healthcare professionals (HCPs) and their influence on the social norm, addressing the general research question:

- Are Portuguese HCPs, in particularly physicians, aware of their role in tobacco control?

The main purpose of this thesis was to explore the awareness of and engagement in tobacco control among Portuguese HCPs, especially among physicians.

Attitudes and beliefs to smoke-free policies (SFPs) and to SHS were studied as indirect measures of smoking social norms; since those measures are strongly related with support for TC policies and social norm change towards denormalisation of tobacco use.[6,19] In addition, tobacco use among HCPs and HCPs' training in TC were systematically assessed, since tobacco use and lack of training are among the major barriers to overcome regarding HCPs' engagement in TC.[39] Consequently, HCPs' awareness and engagement in tobacco control, as well as social norm change regarding SHS, were investigated by the following aims:

a) **Descriptive aims:**

- To describe their smoking behavior trends and attitudes related to smoking behavior and SHS exposure
- To describe attitudes and beliefs to and support for smoke-free policies
- To assess engagement in tobacco control by evaluating the following issues:
  - ✓ participation in smoking prevention and TC activities, including smoking cessation
  - ✓ attendance at TC training (smoking prevention/smoking cessation; undergraduate and graduate training)
  - ✓ awareness on training needs

b) **Inferential aims:**

- To compare HCPs' smoking behavior trends, attitudes related to smoking behavior and SHS exposure, as well as their support for SFPs with the general population
- To identify factors associated with HCPs' attitudes/beliefs to TC and with HCPs' engagement in TC, more specifically:
    - ✓ assessing the relationship between age and speciality with HCPs' TC practices, attitudes and beliefs while comparing those measures between younger and older physicians, and between GPs and hospital-based physicians
    - ✓ assessing the relationship between HCPs' smoking behavior and TC attitudes and beliefs; while comparing those measures between smokers and non-smokers
    - ✓ assessing the relationship between HCPs' smoking behavior and TC engagement, i.e. participation in TC activities (training attendance, awareness of training needs; smoking cessation/prevention activities)
    - ✓ assessing the relationship between HCPs' training in tobacco control and their TC attitudes and beliefs
    - ✓ assessing the relationship between HCPs' training in tobacco control and their engagement in TC
- To assess the association of HCPs' engagement in tobacco control and social norm change regarding SHS by:
    - ✓ exploring HCPs' support for SFP in different settings (workplaces, healthcare and public institutional/administrative buildings; versus leisure and private settings)
    - ✓ comparing TC attitudes and beliefs between younger and older physicians
    - ✓ exploring the effectiveness of a partial smoking ban in a pro-smoking environment

The main research hypotheses were the following:

- If Portuguese physicians/HCPs smoke less than the general population and report greater motivation to quit, or quit at an earlier age than the general population they behave as role models as non-smokers
- If Portuguese physicians/HCPs report more positive attitudes and stronger support to SFPs than the general population and actively participate in TC activities they behave as TC leaders
- If they behave as role models as non-smokers and as TC leaders, they are aware of their role and engaged in TC
- Physicians'/HCPs' engagement in TC is associated with social norm change regarding smoking respectively:
    - ✓ strong engagement in TC is associated with social norm change
    - ✓ poor engagement is associated with restricted or lack of social norm change

2.2 Study design and methodology approach; settings, study population and timing; sampling procedures, survey tools and data collection; ethical approval, funding and declaration of competing interests

According to the aims of this thesis and the availability of resources, a cross-sectional design and a quantitative survey methodology were chosen. In addition, a mixed-methods approach, i.e. using both qualitative and quantitative methodology, was used in one study.

Data collection was based on the following instruments:

- self-administered questionnaires using standardised validated survey tools. Questionnaires were adapted from the ENSH-Global Network For Tobacco Free Health Care Services 2007 questionnaire (quantitative survey methodology)
- interviewer-administered questionnaires that were based on a preliminary field work using semi-structured interviews (mixed-methods approach methodology)
- on-site direct observation using a check list (mixed-methods approach methodology)

All the questionnaires and the observation check list were piloted before the surveys.

Several cross-sectional studies targeting HCPs and non-HCPs in different settings were carried out.

Three settings targeting different populations were selected:

1. A **hospital-based survey** (quantitative methodology approach), carried out at Centro Hospitalar Cova da Beira (CHCB) University Hospital, Covilhã, Portugal. This was a questionnaire-based cross-sectional study conducted among hospital staff prior to the national smoking ban came into force (January 2008), i.e a pre-ban survey. This setting is particularly interesting since:

- This hospital is a major employer in a medium-sized city in inland Portugal. Hospitals, as workplaces, span the socioeconomic and demographics diversity and provide case studies for studying smoking prevalence and behaviour among working population, the impact of TC policies and compliance with smoke-free policies
- In addition, hospital staff generally includes a large range of workers, HCPs' subgroups and non-HCPs. As such, it allows comparisons among physicians and nurses and other HCPs subgroups, as well among HCPs and non-HCPs. Likewise, independent variables such as age, gender, education, professional training, smoking behavior and professional group can be assessed through appropriate statistic methods
- The survey timing (late 2007) was also very convenient, since it was conducted prior to the national smoking ban came into force (January 2008), a period characterized by public debate and heightened awareness of SHS risks and the importance of smoke-free environments, reflecting a proximal effect of the introduction of smoke-free policies
- Hospitals are healthcare organisations integrated in healthcare systems. Thus health systems' engagement and norms can be assessed

This cross-sectional study was a self-administered questionnaire-based survey conducted during November-December 2007 targeting all hospital employees, including HCPs and non-HCPs. Smoking behavior, attitudes and beliefs regarding SHS were surveyed; as well as factors associated with smoking behaviour, agreement with SFPs, and disagreement with SHS exposure. Particularly, it was investigated:

1) whether HCPs such as physicians and nurses are role-models and have the most positive attitudes to SFPs and tobacco control
2) SFP sustainability once the ban was implemented
3) cessation practices by different sub-groups of HCPs. Additional questionnaire items were administered to the hospital HCPs' subsample in order to survey attitudes to smoking cessation counselling; self-reported cessation practices; self-reported attendance and awareness in relation to TC training; factors associated with cessation attitudes, practices and training

Approval for the survey implementation was obtained from the Management Board of CHCB Hospital. The study received ethics approval from the Research Ethics Committee of the CHCB University-Hospital.

2. A **conference-based survey** using a quantitative methodology approach. This was a post-ban survey conducted during two major national medical conferences targeting general practioners (GPs), hospital-based specialists, students/recent graduates. These conferences were the following:

- Portuguese Stroke Society Annual Conference - February 2009, Oporto. Self-administered questionnaires were consecutively distributed to all 450 attendees' physicians
- Portuguese GPs Society Annual Conference - March 2009, Vilamoura. Self-administered questionnaires were distributed to 500 physicians (33% systematic random sample of the total 1500 participants)

This conference was chosen in order to include physicians from all over the country. This survey methodology was chosen since:

- it is difficult to survey physicians.[50,51] Conference surveys with high response rates and low sample selection bias are described in the literature[72]
- conference surveys are cheaper and time-convenient, requiring less resources
- nationwide physicians' databases were not available when the surveys were planned
- attendees of national medical conferences are usually representative of their national associations; these scientific events bring together physicians from all over the country with a wide age range and professional development[72]

Among physicians, GPs should be those most engaged with TC activities.[12] Additionally, younger physicians should be more aware of tobacco control since they have witnessed a time of changing regarding tobacco control at an earlier age than their oldest colleagues. This should have shaped their attitudes, behaviours and norms regarding smoking and tobacco control. In order to contrast GPs with hospital-based physicians and younger and older physicians, this setting was selected.

Smoking behaviour trends were compared between physicians' and the more highly educated general population, using the same survey tools and data from a computer-assisted population-based telephone-interview survey conducted in 2012 (continental-Portugal random sample stratified by residence/gender/age.[73] It was investigated whether Portuguese physicians act as role models as non-smokers, smoke less than the general population and are more motivated to quit.

Additionally, it was explored the awareness of Portuguese physicians regarding their role in tobacco control, specifically:

1) their TC training needs and participation in TC activities
2) their awareness of public health benefits of SFPs
3) the strength of their support for SFPs

The theoretical sample size was 500 physicians assuming an expected prevalence of 22%[71] with a 95% confidence interval (CI) and a precision of 3.6%. Assuming an expected response rate around 60%,[72] 950 questionnaires were delivered.

Approval for the survey implementation was obtained from both conferences' board committees. The organizing committees were previously contacted, in order to sound about the characteristics of attendees (number, specialty, and region). The study received ethics approval from the Research Ethics Committee of the CHCB University-Hospital.

3. A **population-based survey:** a mixed-methods cross-sectional study to explore the effectiveness of the Portuguese partial smoking ban and social norm change in a pro-smoking environment targeting a specific population, specifically transportation by taxi in the city of Lisbon. This site was intentionally chosen as a "natural environment" where boundaries between private and public, regulated and non-regulated settings are blurred, allowing investigating social norm change.

This was a post-ban survey carried out during January, 2009 – December, 2010. A purposive sampling was applied in selected Lisbon streets. On-site observation and structured interviews were conducted by trained researchers while using taxi services as "opportunistic natural clients". Ban effectiveness was generally defined by ban awareness and support, compliance and enforcement. The study was approved by the University of Beira Interior Research Ethics Committee.

Funding: All components of this research are part of a non-funded PhD project.

Declaration of competing interests: the author declares that has no, real or perceived, direct or indirect conflicts of interest; and no relationship of any kind with the tobacco industry.

2.3 Research reports

The study design, the questionnaires, the definition of key variables, the data analysis plan, the findings and its interpretation are explained in detail in five independent research reports addressing specific study settings and aims. These comprise four complete scientific articles of original research and one original research short communication article. The next five sections present these papers in a chronological order regarding the survey implementation and are listed here:

-Smoking behaviour predicts tobacco control attitudes in a high smoking prevalence hospital: A cross-sectional study in a Portuguese teaching hospital prior to the national smoking ban. Ravara SB, Calheiros JM, Aguiar P, Taborda-Barata L. BMC Public Health. 2011;11:720. doi:10.1186/1471-2458-11-720.

-Delivery and recording of smoking cessation advice in a Portuguese teaching hospital: the need for a systemic approach. Ravara SB, Calheiros JM, Aguiar P, Taborda-Barata L. J Subs Use. 2012; 4:311-322. doi.org/10.3109/14659891.2012.685792.

-Smoking behaviour trends among Portuguese physicians: are they role models? A conference-based survey. Ravara SB, Castelo-Branco M, Aguiar P, Calheiros JM. Public Health. 2014;128(1):105-109. doi: 10.1016/j.puhe.2013.08.015.

-Are physicians aware of their role in tobacco control? A conference-based survey in Portugal. Ravara SB, Castelo-Branco M, Aguiar P, Calheiros JM. BMC Public Health. 2014; 14:979 doi:10.1186/1471-2458-14-979.

-Compliance and enforcement of a partial smoking ban in Lisbon taxis: an exploratory cross-sectional study. Ravara SB, Castelo-Branco M, Aguiar P, Calheiros JM. BMC Public Health. 2013;13:134. doi: 10.1186/1471-2458-13-134.

2.4 General Discussion and Conclusions

Chapter four includes a general discussion, summarising the main findings and how they answer to the research question and aims; evaluating the hypotheses; acknowledging the study strengths and limitations; and highlighting the implications for medical and continuing education and for healthcare practice, policy and research.

2.5 Tobacco control in Portugal: the need for a national advocacy strategy

Chapter five acknowledges the contribution of this research to tobacco control in Portugal and comprises an advocacy comment paper critically analysing the "Portuguese marasmus" regarding tobacco control and civil society engagement and HCPs' leadership. This is the last paper of the present research project. It was published as an Editorial in *Revista Portuguesa de Pneumologia* and is presented here:

-**Tobacco Control Progress in Portugal: the need for advocacy and civil society leadership**. Ravara SB, Miranda N, Calheiros JM, Berteletti F, Joossens L. Rev Port Pneumol. 2014;20(6):289-92. doi: 10.1016/j.rppneu.2014.09.003.

Chapter 3
Research reports

Research reports

3.1 Smoking behaviour predicts tobacco control attitudes in a high smoking prevalence hospital: A cross-sectional study in a Portuguese teaching hospital prior to the national smoking ban.

Ravara SB, Calheiros JM, Aguiar P, Taborda-Barata L. BMC Public Health. 2011;11:720 doi:10.1186/1471-2458-11-720. 2014 Impact factor: 2.26.

The on-line version of the article is available at: http://www.biomedcentral.com/1471-2458/11/720. Last accessed: 17th January 2016.

Ravara et al. BMC Public Health 2011, 11:720
http://www.biomedcentral.com/1471-2458/11/720

BMC Public Health

RESEARCH ARTICLE Open Access

Smoking behaviour predicts tobacco control attitudes in a high smoking prevalence hospital: A cross-sectional study in a Portuguese teaching hospital prior to the national smoking ban

Sofia B Ravara[1,2*], Jose M Calheiros[1], Pedro Aguiar[3] and Luis Taborda Barata[1,2]

Abstract

Background: Several studies have investigated attitudes to and compliance with smoking bans, but few have been conducted in healthcare settings and none in such a setting in Portugal. Portugal is of particular interest because the current ban is not in line with World Health Organization recommendations for a "100% smoke-free" policy. In November 2007, a Portuguese teaching-hospital surveyed smoking behaviour and tobacco control (TC) attitudes before the national ban came into force in January 2008.

Methods: Questionnaire-based cross-sectional study, including all eligible staff. Sample: 52.9% of the 1, 112 staff; mean age 38.3 ± 9.9 years; 65.9% females. Smoking behaviour and TC attitudes and beliefs were the main outcomes. Bivariable analyses were conducted using chi-squared and MacNemar tests to compare categorical variables and Mann-Whitney tests to compare medians. Multilogistic regression (MLR) was performed to identify factors associated with smoking status and TC attitudes.

Results: Smoking prevalence was 40.5% (95% CI: 33.6-47.4) in males, 23.5% (95% CI: 19.2-27.8) in females ($p < 0.001$); 43.2% in auxiliaries, 26.1% in nurses, 18.9% among physicians, and 34.7% among other non-health professionals ($p = 0.024$). The findings showed a very high level of agreement with smoking bans, even among smokers, despite the fact that 70.3% of the smokers smoked on the premises and 76% of staff reported being frequently exposed to second-hand smoke (SHS). In addition 42.8% reported that SHS was unpleasant and 28.3% admitted complaining. MLR showed that smoking behaviour was the most important predictor of TC attitudes.

Conclusions: Smoking prevalence was high, especially among the lower socio-economic groups. The findings showed a very high level of support for smoking bans, despite the pro-smoking environment. Most staff reported passive behaviour, despite high SHS exposure. This and the high smoking prevalence may contribute to low compliance with the ban and low participation on smoking cessation activities. Smoking behaviour had greater influence in TC attitudes than health professionals' education. Our study is the first in Portugal to identify potential predictors of non-compliance with the partial smoking ban, further emphasising the need for a 100% smoke-free policy, effective enforcement and public health education to ensure compliance and promote social norm change.

Keywords: Tobacco control, smoking, smoke-free policies, smoking ban, attitudes, healthcare professionals, hospital

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Ravara et al. BMC Public Health 2011, 11:720
http://www.biomedcentral.com/1471-2458/11/720

Background

Implementing a "100% smoke-free environment" policy, as proposed by the World Health Organization (WHO), is essential to reduce harm from smoking [1,2]. Hospitals should play an exemplary role in making smoke-free environments the social norm [3]. However, smoke-free policies (SFP) are not easy to implement and demand perseverance. Public acceptance and support, as well as strong administration commitment and effective enforcement are crucial to obtaining compliance [4-7]. In addition, support for and compliance with tobacco control policies can be influenced by the interaction of several psychosocial and cultural factors, such as socio-demographics, individual attitudes and beliefs, smoking behaviour and nicotine dependence, health beliefs and exposure to SHS, public health education campaigns, social and cultural norms concerning smoking, and tobacco industry marketing and regulation [8-16]. Although smoke-free hospital policies have been implemented in many European countries, exemptions and policy breaches remain frequent [3,17,18]. Hospital tobacco control policies and comprehensive smoking bans help reduce smoking prevalence [19-21] and policy breaches among staff [4,22]. Providing smoke-free environments has been proven not only to protect non-smokers, but also to encourage smokers to quit and participate in TC activities [23,24]. Recent research in countries with comprehensive SFP has shown that:

1. Hospitals, as workplaces, span the socioeconomic spectrum and provide case studies for studying smoking prevalence and behaviour in the adult population, the impact of tobacco control policies and compliance with smoke-free policies [25,26];
2. Evaluating smoke-free policy implementation in a hospital setting may serve as a guide to its sustainability in a broader national context [4];
3. Data is lacking concerning hospital staff smoking prevalence [25];
4. Smoking prevalence among health care providers (HCPs) remains high [27];
5. Implementing a total smoking ban in hospitals is particularly difficult and extending it to outdoor areas even more so [17,25];

Portugal has one of the lowest crude smoking prevalence rates in Europe (20.9%: 30.9% - males; 11.8%-females). It also has one of the highest never-smoking rates in Europe. Nevertheless, age-gender specific prevalence is high in young adults and the working population [28,29]. Since 1982, smoking has been banned on Portuguese healthcare premises. While some hospitals implemented smoke-free policies, enforcement tended to be lax and little change was observed in social norms [30,31]. Since 2008, a new smoking prevention law requires a complete smoking ban in all workplaces and on all non-mental healthcare premises [32]. There have now been several studies in a number of countries investigating attitudes to and compliance with bans on smoking in indoor public areas. But few have been conducted in healthcare settings and none to date in Portugal. Portugal is of particular interest because:

- current national smoking ban (NSB) is a partial one and is not in line with WHO recommendations for a "100% smoke-free" policy;
- timely public health education campaigns were not undertaken [33,34];
- awareness of SHS risks is low and effective smoke-free policy enforcement is lacking [28,35];
- little is known about the smoking behaviour and TC attitudes of Portuguese HCPs.

In October 2007, a Portuguese teaching hospital implemented a tobacco control programme before the national smoking ban came into force on 1 January 2008. Concurrently, staff smoking behaviour and attitudes were surveyed. The study was undertaken to assess among hospital staff:

- smoking prevalence and smoking behaviour
- tobacco control attitudes and beliefs
- factors associated with smoking behaviour and tobacco control attitudes and beliefs.

We also wanted to test if health care providers, especially those who should be role models and leaders on tobacco control, such as physicians and nurses [36], have the most positive attitudes to smoke free policies and tobacco control. In addition, the study also aimed to provide a baseline against which to measure attitudes and behaviour, and guide smoke-free policy sustainability, once the ban was implemented.

Methods

Setting

CHCB is a 340-bed university hospital, employing, according to the November 2007 payroll, 1, 112 salaried workers. The hospital serves a population of 65, 000 in a university city in central inland Portugal and is a major local employer.

Internal tobacco control strategy

Sale of tobacco products was banned in the hospital and an information campaign about the new national policy was conducted three months before the national ban. Enforcement of the new hospital policy received institutional and public publicity through the hospital newsletter

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and local media. Concurrently, smoking cessation programmes were offered to employees and patients. A brief smoking prevention campaign was undertaken simultaneously. As part of the "National No Smoking Day" and "COPD Day", public information campaigns in the hospital's main lobby attracted professionals, patients, visitors and the media. All these activities took place between October and December 2007. The tobacco control strategy aimed to raise smoking prevention awareness and to promote smoke-free compliance among hospital staff, the patients and the wider community.

Study design

An observational, questionnaire-based cross-sectional study was conducted of all salaried employees. A tailored version of the European Network of Tobacco-Free Health Care Services (ENSH) self-administered questionnaire was delivered to all department heads along with a request for cooperation in order to maximise staff compliance. The questionnaire included a cover letter explaining the study's aims and guaranteeing anonymity. Ethical approval for the study protocol and the survey implementation was obtained from the CHCB Hospital Research Ethics Committee. In order to ensure clarity and comprehensiveness of the questionnaire, the base questionnaire was piloted with a small group of 10 health workers (including participants of all the 5 subgroups of health workers) and revised according to their answers and comments. Questionnaires were returned to the smoking prevention department by internal mail, in sealed envelopes. The survey was conducted during November-December 2007.

Sample

All salaried employees on the payroll in November 2007 were eligible for the study. Out of 1.112 sampled employees, 589 (52.9%) responded: 65.9% females; mean age 38.3 ± 9.9 years (min = 20; max = 68).

Instrument survey, measures and definitions

Questionnaire

The original ENSH questionnaire was downloaded from the ENSH website, in October 2007. It was translated into Portuguese and then back into English to ensure accuracy. To ensure that all study objectives were met, in accordance with previously survey methodology [37] the original core questionnaire was supplemented with additional questions regarding smoking behaviour and "TC attitudes and beliefs". Information requested included demographics, personal smoking behaviour and smoking history and attitudes and beliefs concerning SHS and tobacco control policy. All data were self-reported. Information on smoking status, number of cigarettes smoked, smoking initiation age, intention to quit and previous attempts to quit was collected. The wording of questions and response options are shown in the additional file 1.

Smoking behaviour

The definitions used to describe smoking behavior are based on standard WHO definitions for tobacco use [38]. Respondents were classified as current smokers, ex-smokers and never-smokers. A current smoker is someone who at the time of the survey smokes any tobacco product either daily or occasionally and has smoked at least 100 cigarettes in his/her lifetime; an ex-smoker is someone who was a smoker but currently does not smoke at all, and reports having quit over than 6 months ago; an occasional smoker is someone who smokes but not every day; a non-smoker is someone who, at the time of the survey, did not smoke at all; a never-smoker is someone who has never smoked at all, or has smoked fewer than 100 cigarettes in his/her lifetime [38]. All answers regarding smoking behaviour were carefully reviewed to minimize misclassification. For bivariable analyses and logistic regression purposes, ex-smokers and never-smokers were treated as non-smokers. Nicotine dependence was evaluated on the basis of two items from "Fagerstrom's short-form test - "Heaviness of Smoking Index" (HSI). The sum of these two items is the HIS score, an objective measure of nicotine dependence [39].

TC attitudes and beliefs

Additional questions to address "TC attitudes and beliefs" were used to evaluate the following items:

1. Agreement with Hospital Smoke-Free Policy: HSFP (see additional file 1: questions 29-31).

2. Disagreement with SHS exposure in the hospital: SHSEH (see additional file 1: questions 32-34.1).

3. Attitudes and beliefs to the forthcoming national smoking ban: NSB (see additional file 1: questions 34.2-35.2).

Answers were assigned in a four-point scale and dichotomized (yes, no), depending on the content (see additional file 1). For data analysis, binary responses were coded as 1 (yes) and 0 (no). Answers on a four-point scale were aggregated and recoded in binary form as follows: strongly agree and agree (1); strongly disagree and disagree (0); always/almost always and often (1); sometimes and never/almost never (0). Each item regarding "TC attitudes and beliefs" comprised three questions. Answers were dichotomised as described above. A computed variable was created calculating the sum of the scores on each item. Values thus then varied between 0 and 3. These variables were then dichotomised as follows: 3 (1) and 0-2 (0). These three dichotomised variables represent the participants with the maximum score in all three items of each group versus the others. These were the main outcome measures of the bivariate and multivariate analysis, concerning "TC attitudes and beliefs".

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Data Analyses

Data analysis was performed using SPSS, version 15. Frequency distributions were used to describe the data. Bivariable analyses were used to measure associations between selected variables, with statistical significance based on the chi-squared test for independence and Mann-Whitney tests to compare means or medians. The MacNemar test was used to compare categorical variables among matched samples. Two-sided tests of significance were based on the 0.05 level. Multilogistic regression (MLR) was performed to examine factors associated with smoking status, specifically: smokers versus non-smokers (MLR1). Independent explanatory variables included in the MLR1 model were those previously described in the literature as major determinants of smoking [28] and significantly associated with smoking behaviour in the bivariable analysis, namely: gender, age group, and professional group. Education and income were accessed indirectly according to occupation i.e. professional group. Non-binary variables, such as age group and professional group were transformed into suitable dichotomised versions. The professional group categories were: less educated and lower income (auxiliaries), versus others; age categories were: under and over 55. A second MLR analysis was performed (MLR2) to identify factors associated with stronger agreement with a smoke-free hospital policy, positive attitudes and beliefs regarding the national smoking ban and disagreement with SHS exposure in the hospital. The dependent variables were the three dichotomised variables which represent the participants with the maximum score in all three items of each group versus the others. These composite variables were described above, on the questionnaire section. Independent explanatory variables included in the MLR2 model were those previously described in the literature as potentially influencing SHS and TC attitudes and beliefs and significantly associated with at least one of the three items of "TC attitudes and beliefs" in the bivariable analysis. This included age, gender, smoking status and professional group ("role models" specifically: nurses and physicians, versus others). We also tested as a separated MLR2 model: all HCPs versus non-HCPs, physicians versus all others, and nurses versus all others. We included "role models" and HCPs in the model, in order to test if HCPs, especially physicians and nurses, have the most positive attitudes to smoke free policies and tobacco control. A final model was built using a backward stepwise procedure, starting with all variables found statistically significant in the previous step, and removing any non significant interaction. Hosmer and Lemeshow goodness-of-fit test was used at each step to assess the fit of the model. Results are presented as odds ratio and 95% confidence intervals (CI).

Results

Participants

Table 1 presents participants' socio-demographic descriptive characteristics, smoking status, and level of participation by professional group (PG). Age was reclassified into age groups, according to Table 2.

Smoking prevalence and smoking behaviour

Overall smoking prevalence was 29.5% (95% CI: 25.8-33.2). The majority of smokers reported being daily smokers (74.3%). Smoking behaviour was significantly associated with occupation ($p = 0.024$; Table 1). When compared with females, males had a significantly higher smoking prevalence (males: 40.5%, 95% CI: 33.6-47.4); (females: 23.5%, 95% CI: 19.2-27.8); $p < 0.001$) and smoked significantly more (median: 15 cigarettes/day for males; 10 cigarettes/day for females; $p < 0.001$). However, both genders reported starting smoking at the same age (median age: 18.0 years). Age gender-specific smoking rates are shown in Table 2.

Most smokers (76.2%; 112) reported low levels of nicotine dependence; 21.8% (32) reported moderate dependence and only 3 smokers (2%) reported high levels. MLR showed that being younger than 55 was the most important predictor for being a smoker (OR: 3.78; 95% CI: 1.43- 9.97; $p = 0.007$), followed by being a male (OR: 2.32; 95% CI: 1.58-3.40; $p < 0.001$) and by being an auxiliary (OR: 2.15; 95% CI: 1.40-3.31; $p < 0.001$). Most smokers (66.2%) reported that they wanted to quit and 81.0% that they were encouraged to do so by their colleagues. The majority of smokers (65.8%) had already tried, 32.0% admitted that they might need assistance with their next attempt, but only 20.0% admitted readiness to quit.

Smoking in the hospital and TC behaviour

The great majority of smokers (70.3%) admitted smoking on hospital premises during working hours. The highest rates were reported by nurses (81.1%) and "other HCPs" (88.9%). Lower rates were found among administrative staff (40.9%) and physicians (42.9%). Besides occupation ($p = 0.05$), smoking in the hospital was associated with higher nicotine dependence (time of the first cigarette: $p = 0.003$; number of cigarettes per day: $p < 0.001$; HSI score: $p = 0.007$), and shift work ($p = 0.002$). Hospital staff reported smoking more often in the hospital (70.3%) than at home (43.7%) or in the car (53.8%); $p < 0.001$. Nicotine dependence was the only variable significantly related to smoking at home ($p = 0.001$) and in the car ($p < 0.001$).

TC attitudes and beliefs

Table 3 presents attitudes and beliefs concerning TC. The great majority of the responders (97.6%) believed

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Table 1 Descriptive characteristics and smoking status of the sample and level of participation by professional group (PG)

PG	a)	b)	Males c)	Females c)	Participation d)	Smokers	Never Smokers	Ex-Smokers
Office staff	100	17.2	23.0	77.0	59.5	23.5	57.1	19.4
Physicians	37	6.3	67.6	32.4	30.8	18.9	59.5	21.6
Nurses	226	38.8	29.3	70.7	72.0	26.1	56.3	17.6
Other HCPs	46	7.9	21.7	78.3	46.9	21.7	54.3	23.9
Auxiliaries*	125	21.4	38.7	61.3	48.0	43.2	46.4	10.4
Other non-HCPs	49	8.4	53.1	46.9	50.5	34.7	46.9	18.4
Total**	583	100.0	34.1	65.9	52.9	29.5	53.4	17.1

a) Total number of responders per PG; b) % of the participants sample; c) % within the responders by PG; d) % within hospital staff by PG.
*In Portugal auxiliaries do not receive specific professional health education. In general they have less than 10 years' education (in this hospital 60% have less than 7 years' education; 40% ≤ 4 years). Nurses have a minimum of 15 years' education and physicians at least 18 years. Auxiliaries have the lowest income and physicians the highest. ** 6 missing

that SHS is harmful and agreed that the hospital should be smoke free (91.8%). Most of them believed that tobacco smoke is the principal indoor pollutant (97.3%) and agreed with the forthcoming national smoking ban (93.9%). The great majority of smokers believed that SHS is harmful (97.0%). Although to a lesser extent than the non-smokers, most smokers supported the smoking bans (HSFP: 85.4%; NSB: 85.8%; $p < 0.001$). Although 76.0% of the staff reported being frequently exposed to SHS in the hospital, only 42.8% reported that SHS was unpleasant for them, and only 28.3% complained about SHS exposure. Most of the hospital staff (74.6%) thought that the national smoking ban would help smokers quit, but only 25.7% admitted complaining about SHS in public places. The proportion of participants with maximum score on hospital smoke-free policy agreement was significantly higher than those reporting disagreement with SHS exposure in the hospital ($p < 0.001$). MLR2 analyses (Table 4) showed that attitudes to hospital smoke-free policies and to the national ban, and also disagreement with SHS hospital exposure, were related to smoking status, but not to gender or age. Physicians agreed less with hospital smoke-free policies but not to a statistically significant extent. Only one physician reported high levels of nicotine dependence. This physician reported less positive attitudes to tobacco control (TC) policies and less disagreement to SHS exposure. In addition, disagreement with SHS hospital exposure was significantly related to being "role models". MLR2 analyses showed that smoking status was the most important predictor of TC attitudes and beliefs. Being a smoker was associated with less positive attitudes to hospital smoke-free policy and to the national ban, and with less disagreement with SHS hospital exposure. We also observed that smokers with the highest nicotine dependence levels reported the lowest support for smoke-free policies and the less

Table 2 Smoking behaviour by gender and age group (years)

Gender**	Age group	Smokers		Never-smokers		Ex-smokers		Total
		n	%*	n	%*	n	%*	
Males	20-34	39	50.0	38	48.7	1	1.3	78
	35-44	19	35.2	25	46.3	10	18.5	54
	45-54	16	37.2	10	23.3	17	39.5	43
	55-68	5	25.0	9	45.0	6	30.0	20
	Total	79	40.5	82	42.1	34	17.4	195
Females	20-34	29	18.2	105	66.0	25	15.7	159
	35-44	38	31.1	61	50.0	23	18.9	122
	45-54	21	29.2	40	55.6	11	15.3	72
	55-68	0	0.0	18	85.7	3	14.3	21
	Total	88	23.5	224	59.9	62	16.6	374
Overall Smoking Prevalence	Total 580	171	29.5	310	53.4	99	17.1	

*%within the age group
**4 missing data regarding gender & age group

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Table 3 Tobacco Control attitudes and beliefs

1. HSFP agreement							
			Smoking Status				
			Smokers		Non-Smokers		Statistics Tests
Agreement	N	%	n	%	N	%	$Chi^2 = 44.097$
Yes	422	79.6	95	62.1	324	87.6	df = 1
No	108	20.4	58	37.9	46	12.4	p < 0.001
Total	530	100.0	153	100	370	100	
2. Disagreement with SHS exposure in the hospital							
			Smoking Status				
			Smokers		Non-Smokers		Statistics Tests
Agreement	N	%	n	%	N	%	$Chi^2 = 32.017$
Yes	144	26.1	15	9.5	127	33.0	df = 1
No	407	73.9	143	90.5	258	67.0	p < 0.001
Total	551	100.0	158	100	385	100	
3) Attitudes and beliefs to the national smoking ban							
			Smoking Status				
			Smokers		Non-Smokers		Statistics Tests
Agreement	N	%	n	%	N	%	$Chi^2 = 10.035$
Yes	91	18.9	14	10	75	22.5	df = 1
No	390	81.1	126	90	259	77.5	p = 0.002
Total	481	100	140	100	334	100	

Agreement: n and % of the participants with the maximum score in all three items of each group of "TC attitudes and beliefs", versus all others. Yes: participants who reported stronger agreement with a smoke-free hospital policy, more positive attitudes and beliefs regarding the national smoking ban and stronger disagreement with SHS exposure in the hospital. No: all the others.

positive tobacco control attitudes (data not shown). However, their number is too small to use statistical tests. Being a physician or nurse was significantly associated with the strongest disagreement about SHS exposure in the hospital, but not with other indoor public places. Smokers who reported wanting to quit expressed greater hospital smoke-free policy acceptance compared with pre-contemplation smokers ($p < 0.05$), but did not report more positive attitudes to the national ban, neither stronger disagreement to SHS hospital exposure. Knowledge of SHS harmfulness was overwhelmingly reported and was not significantly related to age, gender, occupation, or to smoking status and nicotine dependence (data not shown).

Table 4 Tobacco Control attitudes and beliefs: MLR2

Dependent variable						
	HSFP agreement		SHSHE		NSB	
Independent Variable*	Wald p value	Odds ratio (95% C.I.)	Wald p value	Odds ratio (95% C.I.)	Wald p value	Odds ratio (95% C.I.)
Gender	0.19	0.73 (0.46-1.17)	0.81	0.95 (0.62-1.46)	0.59	1.15 (0.70-1.88)
Smoking status	< 0.001	4.29 (2.70- 6.79)	< 0.001	4.50 (2.52-8.04)	0.002	2.65 (1.43-4.92)
Professional group	0.46	0.84 (0.53-1.33)	0.01	1.65 (1.11-2.46)	0.58	1.14 (0.71-1.82)
Model explanation	79.9%	-	73.7%	-	81.1%	-
Hosmer and Lemeshow test	Chi value = 1.52; df = 5	p = 0.91	Chi value = 1.11; df = 5	p = 0.95	Chi value = 8.86; df = 6	p = 0.18

*Gender: male (1), female (0); Smoking status: non smoker (1), smoker (0);
Professional group: role models - nurses and physicians (1); all the others (0)
HSFP - Agreement with Hospital Smoke-Free Policy
SHSHE - Disagreement with Second Hand Smoke Hospital Exposure
NSB - attitudes and beliefs to the National Smoking Ban

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Discussion

Our study identified high smoking rates among hospital staff, especially among the less well educated and lower income groups. A strong occupation gradient was observed in smoking prevalence, the lowest rates being observed in physicians. This trend is consistent with other recent studies [25,26,40,41]. Smoking behaviour was related to age, gender, education, and income, in much the same way as occurs in the general Portuguese population [28,42]. The great majority of hospital staff, including smokers, supported and had positive attitudes to a hospital smoke-free policy and to the forthcoming smoking ban, as observed, in 2006, by the Eurobarometer survey [43]. Most smokers smoked on hospital premises and high exposure levels were reported. The majority of the staff did not report that SHS was unpleasant and only a minority complained about it, as observed in the general population [28]. Physicians' and nurses' TC behaviour and attitudes to hospital smoke-free policy and to the national ban did not correlate with their status as "role models". Being a smoker was the most important predictor of "TC attitudes and beliefs".

Smoking prevalence among hospital staff was high when compared with the general Portuguese population and even higher when compared with local population data [28]. In addition, smoking rates are higher than in countries where comprehensive TC policies have a longer history and effective enforcement [25,26,44-48]. However, when compared with other studies in southern Europe, overall smoking and female rates are lower and the crude male rate is higher [49-51]. This trend may be explained by the fact that Portugal is between phases 2 and 3 of the tobacco epidemic [42]. When compared with Italy and Spain, Portuguese females are less frequently smokers, while male rates started decreasing later than in those countries [42,52,53]. We must emphasise the high prevalence of non-daily smokers in our sample. According to Schiffman [54] non-daily smokers are becoming increasingly prevalent and more frequent among the younger population and females [55]. The lowest smoking rates were observed among physicians, in line with declining prevalence trends among physicians in Portugal [30] and other countries [56]. These trends [22,25,26,56,57], further illustrate the growing social gap in smoking prevalence and cigarette consumption [58]. As in other studies [59], smoking in the hospital was associated with higher nicotine dependence and shift work. Hospital staff perform their duties under stress and shift work overloads, and experience heavy emotional, social and physical demands [60]. This may partly explain why smoking in the hospital is related to shift work and occupation. As observed in other studies in southern Europe, female HCPs have a higher smoking prevalence rate than the overall female population. In some studies, female HCPs have higher smoking prevalence rates than males [49,51,61,62]. This may be associated with higher work stress levels and rapidly changing social roles [63], as well as tobacco industry strategies [64,65]. As in another recent study [25], nurses had the highest participation in the survey. This may indicate that nurses are more motivated to participate in smoking prevention programmes. Since nurses have a significant impact on smoking cessation among patients [66], team approach training programmes should always involve this group [67]. However, in yet other studies [25,61,62] nurses had high smoking prevalence rates. This may be a barrier to systematic proactive approaches to smoking cessation [68]. Physicians had the lowest collaboration in the survey. Thus, as responders are usually those most interested in the subject, we may assume that the non responders may have higher smoking rates and less positive attitudes. As in another study [4], physicians agreed less with the hospital smoke-free policy. In addition, despite reporting the lowest smoking rate among the HCPs, physicians' TC behaviour and attitudes to a smoke-free hospital and to the national ban did not correlate with their status as TC "role models". These findings illustrate the lack of interest and engagement of Portuguese hospital doctors in TC policies, as well as their limited understanding of its importance. This may contribute to the current lack of TC policies in Portugal, as has been clearly documented by Joossens and Raw [33,34]. We must also emphasise that physicians and nurses reported the highest levels of disagreement concerning SHS exposure in the hospital, but not for other indoor public places. These findings suggest that physicians' and nurses' normative beliefs concerning hospital TC policies differ than TC policies concerning other indoor settings. We conclude that smoking behaviour and Portuguese cultural norms and social beliefs influence support for and attitudes to TC policies more strongly than professional education and clinical experience. Given our study design and measurement limitations these results should be interpreted with caution. Our results nevertheless indicate that HCPs smoking prevalence remains high in Portugal. Our study also suggests that HCPs participants in this survey might not have received appropriate training in tobacco control. The high smoking prevalence, including smoking rates on hospitals premises and attitudes to SHS are not consistent with the public health burden of tobacco epidemics. As in another study [26], although most smokers wanted to quit and had already tried, only a few admitted that they might need help and very few admitted readiness to quit. Tailored smoking cessation programmes should be designed to raise HCPs' self-confidence and readiness to

quit, and promote assisted quitting. Stress management programmes should be implemented to educate and promote effective stress management. Hospital-based health education and smoking cessation programmes should be gender-specific, as females are the main providers of practical patient care in hospitals and their smoking prevalence is high. These programmes should also address socio-economic status and nicotine dependence. Smoking prevention and tobacco control should be an essential component of undergraduate curricula in all health science schools. Tailored, gender-specific cessation programmes should be implemented in these settings. Tobacco control programmes in Portugal need to be more comprehensive, including recognition that smoking prevalence among young adults, and among working populations and HCPs remains worryingly high. Our findings also highlight the fact that Portugal, while smoking less than other European countries, mainly because women started smoking later, will move into a difficult tobacco control situation unless comprehensive tobacco control best practices are implemented. Future declines in tobacco use in Portugal will likely depend on the development of a comprehensive national tobacco control programme. Effective policies to target lower socio-economic groups, as well as workplace and university based smoking prevention programmes must also be top priorities of a national tobacco control strategy. Our study showed a very high level of acceptance of smoking bans, despite high smoking prevalence and the pro-smoking environment. Smokers reported significantly lower levels of disagreement over SHS exposure. These findings are consistent with previous research [4,11-15,25,59]. Strong support for smoke-free policies, even among smokers, has been reported in several countries that implemented smoking bans, even in the presence of pro-smoking social norms and high prevalence [11,69]. Even among smokers, support for and compliance with smoke-free policies increase over time, especially in countries that adopt strong policies while promoting public health education, self-regulation and social norm change [7,26,69]. Positive hospital staff attitudes to the forthcoming ban suggest that if such a ban is implemented rigorously the level of compliance will be high but, without a comprehensive ban and effective enforcement, attitudes alone are not sufficient to achieve a smoke-free environment. Moreover, most staff reported passive responses to high SHS exposure. As in other studies, this illustrates an important barrier to successful policy implementation since staff will not enforce the hospital smoke-free policy and will not challenge smokers on the premises [17]. This may be a potential predictor of non-compliance with the smoking ban, especially if public health education and effective enforcement are lacking [33-35]. Previous research has identified that where there is high smoking prevalence and a pro-smoking environment, most smokers fail to comply with smoking ban [12,35]. Moreover, compliance with smoking bans was not related to smokers' attitudes, but it is predicted by tobacco dependence and normative beliefs [12,14]. Portugal implemented a partial smoking ban, full of ambiguities and exemptions [32]. A partial ban does not fully protect all citizens from SHS exposure and has limited strength to promote a wide social norm change and may contribute to health and social inequalities. Most of the staff did not report being annoyed by SHS, despite high SHS exposure. Vardavas et al, 2011 [8], observed that non-smokers reported that they would proactively enforce the law, to promote compliance. Besides age and education, being bothered by SHS was associated with this intention. Therefore, a key strategy for policy-makers is to raise awareness of SHS health hazards while empowering non-smokers through public media campaigns and by informing them of their rights [8]. Another key strategy is to implement a strong smoke-free policy and monitor support and compliance over the time. Finally, hospital smoking bans "may create the paradox that smoking actually becomes more visible" [26], especially if smoking prevalence is high and smokers can be seen by the community smoking in shelters and around hospital entrances [25]. This will contribute to perceived high smoking prevalence and social acceptance. When HCPs are seen smoking, it clearly counters their status as role models and smoking cessation promoters, undermining social norm change. We therefore agree with others [26,70,71] who have argued that a comprehensive ban on smoking outside hospitals is a crucial component of good smoke-free hospital policy.

Strengths and limitations

Our study is the first one in Portugal to focus on smoking behaviour and HCP attitudes to tobacco control prior to a national smoking ban. It was conducted in a high smoking prevalence hospital, with high SHS exposure levels. This study thus provides a baseline against which to measure smoking behaviour and attitudes now that the ban has been implemented. It also serves as a case study for the implementation of smoke-free policies in a pro-smoking environment. Given that our study focused on a single hospital, our conclusions cannot be extrapolated to Portuguese hospitals in general. And, while our study cannot be considered as representative of the national pattern, we nevertheless believe that our sample gives an indication of tobacco control standards in Portuguese hospitals prior to the implementation of the national ban. The cross-sectional design of our study leaves little scope for inferences as to causality. Also, since data were self-reported, social desirability bias cannot be excluded. The survey was, moreover, conducted just before the national ban was

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introduced; a period characterised by public debate and heightened awareness of SHS risks and the importance of smoke-free environments, reflecting a proximal effect of the introduction of smoke-free policies [72]. Furthermore, assessing smoking prevalence and attitudes using questionnaires may not reflect the actual situation. Sample selection bias and measurement errors may occur. Some reassurances as to accuracy are, however, provided by the fact that the ENSH questionnaire has been validated in many European countries and our additional questions validated by an earlier study. Since the response rate was above 50%, it is unlikely that our findings are biased by limited participation. Finally, the fact that few physicians participated in the survey means that this group is under represented.

Conclusions

Our study identified high smoking rates among hospital staff, especially among the lower socio-economic groups. Most staff reported passive behaviour, despite high SHS exposure. This, plus the high smoking prevalence observed may contribute to low compliance with the smoking ban and low participation in smoking cessation activities [13,73]. Smoking behaviour had greater influence in tobacco control attitudes than health professionals' education. Smoking prevention and tobacco control should be top priorities in all health science schools and healthcare services. Our study is the first in Portugal to identify potential predictors of non-compliance with the partial smoking ban, further emphasising the need for a 100% smoke-free policy, effective enforcement and public health education to ensure compliance and promote social norm change. Our study also leads to the conclusion that post-ban evaluation and multi-centre studies should be undertaken in Portugal to monitor smoking behaviour, tobacco control attitudes and compliance with the smoking ban.

Additional material

Additional file 1: CHCB Staff- Tobacco survey Questionnaire- English version. Microsoft word. This file contains the adapted version of the European Network of Tobacco-Free Health Care Services self-administered questionnaire. This version was administered on the survey.

List of abbreviations used

CI: confidence intervals; COPD: Chronic Obstructive Pulmonary Disease; ENSH: European Network of Tobacco-Free Health Care Services; HCPs: Health care providers; HIS: Heaviness of Smoking Index; HSFP: Hospital Smoke Free Policy; MLR: Multilogistic regression; NSB: national smoking ban; SFP: Smoke-Free Policies; SHS: Second-hand smoke; SHSEH: Second-hand smoke exposure in the hospital; TC: Tobacco Control; WHO: World Health Organization

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Authors' contributions

SBR and JMC designed the study and gathered the information, performed the statistical analysis, analysed and interpreted the data, and wrote the paper. PA performed the statistical analysis, analysed and interpreted the data, and critically reviewed the paper. LTB analysed and interpreted the data and critically reviewed the paper. All authors contributed, read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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3.2 Delivery and recording of smoking cessation advice in a Portuguese teaching hospital: the need for a systemic approach.

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ORIGINAL ARTICLE

Delivery and recording of smoking cessation advice in a Portuguese teaching hospital: the need for a systemic approach

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Abstract

Background: Smoking cessation should be a top priority in hospitals. In November 2007, a Portuguese teaching hospital carried out a survey to evaluate cessation attitudes, clinical practices and cessation training needs among hospital-based healthcare providers (HCPs). The study also aimed to identify factors associated with cessation attitudes and practices, self-confidence to intervene and awareness of training programs.

Method: This is a cross sectional questionnaire-based study including all HCPs.

Sample: The study sample covers 424 HCPs, of which 65.4% were females. Mean age of these HCPs was 38.7 ± 10.1 years and the overall response rate was 50.5%. For data analyses, chi-squared tests, McNemar tests and multiple logistic regression models were used.

Results: Most physicians and nurses reported "Asking" and "Advising" always or often. Other HCPs reported low frequencies of "Asking" and "Advising" ($p < 0.001$). Systematic "Asking" was reported less often than "Advising" ($p < 0.001$). Most HCPs did not record cessation practices, lacked specific training, and were not aware of their training needs. Reported self-confidence, positive attitudes and being a physician or non-smoker were the factors that influenced cessation practices the most.

Conclusion: The findings suggest that there is reason to doubt that cessation practices are being undertaken effectively. Hospitals should audit smoking status recording, delivery of effective cessation advice and post-discharge support. Cessation indicators should be mandatory in all healthcare settings. To achieve these goals, undergraduate and graduate cessation training must be given higher priority.

Keywords: *Smoking cessation, medical records, training, hospital*

Background

Tobacco use is the greatest single preventable cause of death and a major cause of morbidity and disability (World Health Organization (WHO), 2008). All healthcare providers (HCPs), especially physicians, should act as a role model by being a non-smoker themselves and

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should systematically integrate smoking cessation in clinical practice (WHO, 2004; Fiore et al., 2008). Initiating smoking intervention in the hospital and ensuring post-discharge follow-up support are effective in promoting smoking cessation. Moreover, hospital may be the best setting to quit smoking, as patients feel both more vulnerable and more motivated, especially when they see their disease as smoking related, and also benefit from the support of multiple HCPs. In addition, tobacco-free hospitals help smokers maintain abstinence, especially when smokers are treated with nicotine replacement therapy (Emmons & Goldstein, 1992; Munafo et al., 2001; Rigotti et al., 2008; Wolfenden et al., 2008). Nevertheless, although hospitalisation may provide a teachable moment to intervene and a window of opportunity for initiating smoking cessation interventions, inpatient smokers may be less likely to receive effective counseling and support (Emmons & Goldstein, 1992; McCarty et al., 2001; Bolman et al., 2002; Rigotti et al., 2008; Duffy et al., 2010). One of the main barriers to effective counseling is the lack of training in clinical skills and structured interventions (Monson, 2004; Patwardhan & Chewning, 2009). In addition, cessation counseling is influenced by HCPs' knowledge about cessation, their skills and their attitudes toward cessation (Doran et al., 1998) and also by their smoking status (Willaing & Ladelund, 2004). Support from multiple HCPs increases treatment effectiveness and smoking abstinence rates (Gorin & Heck, 2004; Fiore et al., 2008). In hospitals in particular, team-based cessation programs should always involve multiprofessional groups. However, relatively little is known about the attitudes of hospital-based HCPs towards their role in assisting smoking cessation. Few studies involving multiprofessional HCPs have targeted cessation practices, in hospital settings. In November 2007, a survey of smoking behaviour and tobacco control attitudes among all hospital staff was conducted in a Portuguese teaching hospital (Ravara et al., 2011). An additional questionnaire for all HCPs was undertaken to evaluate the following:

- attitudes towards smoking cessation counseling,
- self–reported attendance at cessation training (CT) programs and self–reported training needs,
- self–reported confidence to intervene in smoking cessation,
- self–reported cessation practices and record–keeping procedures,
- factors associated with cessation attitudes and practices, self–confidence to intervene and awareness of training program needs.

We also wanted to test if cessation practices were reported by different sub-groups of HCPs.

Method

Setting

Cova da Beira Hospital Centre (CHCB) is a 340-bed university hospital, employing, according to the November 2007 payroll, 1112 salaried workers.

Study design

In order to implement a tobacco control program and to engage all hospital workers, a questionnaire-based cross sectional study was conducted for all salaried employees. A tailored version of the Global Network for Tobacco-free Health Care Services (ENSH) self-administered questionnaire was delivered to all department heads during the period of November–December 2007. The questionnaire included a cover letter explaining the study's

aims and guaranteeing anonymity. Ethical approval for the study was obtained from the CHCB Hospital Research Ethics Committee.

Sample

Altogether, 434 HCPs participated in the survey. Ten HCPs were mistakenly delivered an incomplete questionnaire form and therefore were excluded from the study. Thus, the study sample covers 424 HCPs working in inpatient and outpatient settings: 37 physicians, 225 nurses, 124 auxiliaries and 38 other HCPs (OHPs). Among these, 65.4% were females; mean age was 38.7 ± 10.1 years (min = 22; max = 68). Overall response rate was 50.5%.

Questionnaire and measures

An additional 13-item questionnaire was administered to the HCPs in order to evaluate the following:

1. attitudes towards proactive cessation counselling (PCC) and to being role models (RMs) as non-smokers,
2. self-reported attendance and awareness in relation to undergraduate and graduate cessation training (CT),
3. self-reported confidence to intervene in cessation,
4. self-reported 2As (Ask and Advise) cessation practices,
5. self-reported record-keeping procedures, including 2As and tobacco use diagnosis.

Only 2As were surveyed because the survey was undertaken prior to the implementation of smoking cessation services and formal training. Smoking status was assigned on the basis of the information provided and participants were classified in accordance with the WHO guidelines (WHO, 1997). Answers to questions on cessation attitudes were ranked on a three-point scale. Answers to 2As were ranked on a four-point scale. Answers to record-keeping procedures were also ranked on a four-point scale; then "always" and "often" were aggregated and recoded as "Yes" and "Sometimes", respectively, and "never" was recoded as "No". Answers to items 2 and 3 were dichotomised (yes/no). Answers on three- and four-point scales were aggregated and recoded in a binary form (1/0), as indicated in the data analyses section.

Data analyses

Frequency distributions were generated for all variables. Bivariable analyses were performed using chi-squared tests and McNemar tests. Associations with all variables were tested. A two-sided p value of 0.05 was considered statistically significant. Multiple logistic regression (MLR) models were used to examine factors associated with the following:

1. HCPs' cessation attitudes towards PCC and to being RMs,
2. awareness of training programs needs,
3. self-confidence to intervene,
4. cessation practices: 2As and record-keeping procedures.

MLR-dependent variables in items 1 and 4 were transformed into suitable dichotomised versions as follows: (a) Most positive attitudes (PAs): I totally agree (1) versus less positive: I somewhat agree or I do not agree (0); (b) Practices: "always/almost always and often" (1)

versus "sometimes and never/almost never" (0). MLR binary-dependent variables in items 2 and 3 were coded as 1 (yes) and 0 (no). Independent variables in the regression model analysis included those studied by previous research or significantly associated with the dependent variables in the bivariable analysis, such as HCP subgroups (physicians or nurses/others), smoking status (smokers/non-smokers), attitudes toward cessation (positive/less positive), CT and self-confidence (yes/no). We also controlled for HCP demographics (gender and age). A backward elimination of independent explanatory variables at a 5% level of significance was performed. Results were presented as odds ratios (ORs) and 95% confidence intervals (CIs). Statistical analyses were performed with SPSS, version 17.

Results

Table I describes HCPs' smoking behaviour and survey collaboration.

Smoking prevalence was 41.2% in males (95% CI: 32.6–48.4) and 23.9% in females (95% CI: 18.5–28.5) ($p < 0.001$).

Smoking cessation attitudes are presented in Table II.

Proactive cessation counseling

Never smokers (NSs) and occasional smokers (OSs) reported significantly more PAs than daily smokers (DSs) and ex-smokers (ESs) (PAs: NSs + OSs: 59.9%; DSs + ESs: 48.2%; $p = 0.025$). MLR analyses showed that undergraduate CT was a predictor of more PAs (OR: 2.68; 95% CI: 1.52–4.72; $p = 0.001$), followed by being a physician (OR: 2.59; 95% CI: 1.14–5.89; $p = 0.024$) or nurse (OR: 1.98; 95% CI: 1.27–3.09; $p = 0.003$).

Role model

All HCPs had more PAs towards being RMs than towards PCC ($p < 0.001$). Being a DS (OR: 0.41; 95% CI: 0.25–0.69; $p = 0.001$) or being younger than 44 (OR: 0.54; 95% CI: 0.31–0.92; $p = 0.024$) were associated with less PAs.

Table I. HCPs' smoking behaviour and survey collaboration by PG

PG	Total number of responders per PG	Percentage within the responders	Percentage of males within the PG in the responders	Percentage of females within the PG in the responders	Percentage of participation within the hospital staff by PG	Percentage of smoking behaviour within the PG in the responders ($p = 0.007$)		
						Smokers	Never smokers	Ex-smokers
Physicians	37	8.5	67.6	32.4	30.8	18.9	59.5	21.6
Nurses	226	52.1	29.3	70.7	72.0	26.1	56.3	17.6
OHPs	46	10.6	21.7	78.3	46.9	21.7	54.3	23.9
Auxiliaries	125	28.8	38.7	61.3	48.0	43.2	46.4	10.4
Total	434	100.0	34.4	65.6	51.7	29.9	53.7	16.4

OHPs, other healthcare providers; PG, professional group. OHPs include pharmacists, psychologists, social workers, rehabilitation and other allied health staff.

Table II. Smoking cessation attitudes

	Totally agree		Somewhat agree		Disagree			Missing	
HCPs	*n*	%†	*n*	%†	*n*	%†	Total (*n*)	*n*	%‡
*Do you agree that proactive patient counseling to quit is part of the HCPs' role?**									
Physicians	29	78.4	6	16.2	2	5.4	37	0	0.0
Nurses	149	67.1	64	28.8	9	23.2	222	3	1.3
OHPs	15	42.9	17	48.6	3	8.6	35	3	7.9
Auxiliaries	33	33.3	39	39.4	27	27.3	99	25	20.2
Total	226	57.5	126	32.1	41	10.4	393	31	7.3
*Do you agree that HCPs should be role models as non-smokers?**									
Physicians	30	81.1	7	18.9	0	0.0	37	0	0.0
Nurses	154	69.7	59	26.7	8	3.6	221	4	1.8
OHPs	23	65.7	12	34.3	0	0.0	35	3	7.9
Auxiliaries	67	67.7	29	29.3	3	3.0	99	25	20.2
Total	274	69.9	107	27.3	11	2.8	392	32	7.5
$p < 0.001$									

HCPs, healthcare providers; OHPs, other healthcare providers.
*$p < 0.001$; †within the responders; ‡within the responders of each professional group.

CT program attendance and needs

Undergraduate CT was reported by 27.0% of doctors, 32.9% of nurses and 8.8% of OHPs ($p = 0.016$). Graduate CT was reported by 13.5% of doctors, 8.0% of nurses and 0.0% of OHPs. CT needs were reported by 41.7% of doctors, 36.5% of nurses and 35.3% of OHPs. DSs and ESs were less aware of the training needs than NSs and OSs (OR: 0.49; 95% CI: 0.29–0.84; $p = 0.009$).

Self-confidence to intervene in cessation

Self-confidence was reported by 59.5% of doctors, 70.8% of nurses and 50.0% of OHPs ($p = 0.033$). HCPs reporting undergraduate and graduate CT were more confident to intervene (undergraduate CT: 84.1% vs. 58.9%, $p < 0.001$; graduate CT: 90.5% vs. 63.7%, $p = 0.013$). MLR showed that undergraduate CT (OR: 2.82; 95% CI: 1.41–5.61; $p = 0.003$) and being a nurse (OR: 1.99; 95% CI: 1.08–3.67; $p = 0.03$) predicted self-confidence.

Cessation practices

Cessation practices are described in Tables III, IV and V. Systematic frequency refers to "always" frequency.

Ask

MLR identified multiple factors predicting reported "Ask" frequencies: (1) being a physician (OR: 4.11; 95% CI: 1.58–10.72; $p = 0.004$); (2) undergraduate CT (OR: 3.76; 95% CI: 2.02–7.00; $p < 0.001$); (3) being a male (OR: 2.19; 95% CI: 1.31–3.69; $p = 0.003$); (4) being self-confident (OR: 1.99; 95% CI: 1.19–3.32; $p = 0.009$); (5) positive PCC attitudes (OR: 1.95; 95% CI: 1.19–3.20; $p = 0.008$) and (6) smoking status (non-smokers: OR: 1.76; 95% CI: 1.02–3.05; $p = 0.04$).

Table III. Self-reported 2A frequencies

	Always/almost always		Often		Sometimes		Never/almost never			Missing	
HCPs	*n*	%†	*n*	%†	*n*	%†	*n*	%†	Total (*n*)	*n*	%‡
*Ask**											
Physicians	18	50.0	12	33.3	5	13.9	1	2.8	36	1	2.7
Nurses	56	25.8	82	37.8	67	30.9	12	5.5	217	8	3.6
OHPs	3	8.8	6	17.6	19	55.9	6	17.6	34	4	10.5
Auxiliaries	2	2.3	8	9.2	40	46.0	37	42.5	87	37	29.8
Total	79	21.1	108	28.9	131	35.0	56	15.0	374	50	11.8
*Advise**											
Physicians	21	60.0	10	28.6	2	5.7	2	5.7	35	2	5.4
Nurses	74	34.1	76	35.0	57	26.3	10	4.6	217	8	3.6
OHPs	5	14.7	8	23.5	14	41.2	7	20.6	34	4	10.5
Auxiliaries	21	23.9	6	6.8	41	46.6	20	22.7	88	36	29.0
Total	121	32.4	100	26.7	114	30.5	39	10.4	374	50	11.8

HCPs, healthcare providers; OHPs, other healthcare providers.
*$p < 0.001$; †within the responders; ‡within the responders of each professional group.

Table IV. Ask and advice self-reported record-keeping

	Outpatients								Inpatients							
	Yes		No		NA		Missing		Yes		No		NA		Missing	
HCPs	*n*	%†	*n*	%†	*n*	%†	*n*	%‡	*n*	%†	*n*	%†	*n*	%†	*n*	%‡
*Ask**																
Physicians	21	56.8	16	43.2	0	0.0	0	0.0	16	43.2	21	56.8	0	0.0	0	0.0
Nurses	41	21.1	144	73.8	10	5.1	30	13.3	70	35.7	123	62.8	3	1.5	29	12.9
OHPs	2	5.9	21	61.8	11	32.3	4	10.5	1	2.9	19	55.9	14	41.2	4	10.5
Total	64	24.1	181	68.0	21	7.9	34	11.3	87	32.6	163	61.0	17	6.4	33	11.0
*Advise***																
Physicians	11	29.7	26	70.3	0	0.0	0	0.0	4	10.8	33	89.2	0	0.0	0	0.0
Nurses	17	8.7	168	86.2	10	5.1	30	13.3	27	13.8	165	84.6	3	1.5	30	13.3
OHPs	2	5.9	21	61.8	11	32.4	4	10.5	1	2.9	19	55.9	14	41.2	4	10.5
Total	30	11.3	215	80.8	21	7.9	34	11.3	32	12.0	217	81.6	17	6.4	34	11.3

Note: Auxiliaries were excluded from these analyses as their activity does not include record-keeping.
HCPs, healthcare providers; NA, not applicable; OHPs, other healthcare providers.
*$p < 0.001$; **$p = 0.002$; †within the responders; ‡within the responders of each professional group.

Advise

Being a physician (OR: 5.71; 95% CI: 1.89–17.26; $p = 0.002$), positive PCC attitudes (OR: 3.42; 95% CI: 2.15–5.43; $p < 0.001$) and self-confidence (OR: 2.29; 95% CI: 1.43–3.69; $p < 0.001$) predicted self-reported "Advise" frequencies.

All HCPs reported systematic "Asking" less often than systematic "Advising" ($p < 0.001$).

Record-keeping procedures are shown in Tables IV and V.

Physicians reported documenting smoking status less often than "Asking", especially among inpatients ($p = 0.012$). Being a physician (OR: 5.48; 95% CI: 2.54–11.83; $p < 0.001$), followed by being a non-smoker (OR: 2.73; 95% CI: 1.38–5.39; $p = 0.004$) and

Table V. Tobacco use diagnosis self-reported record-keeping procedures

	Yes		No		NA		Missing	
HCPs	*n*	%*	*n*	%*	*n*	%*	*n*	%**
Physicians	6	16.2	31	83.8	0	0	0	0.0
Nurses	23	11.8	171	87.7	1	0.5	30	13.3
OHPs	1	2.9	23	67.6	10	29.4	4	10.5
Total	30	11.3	225	84.6	11	4.1	34	11.3

Note: Auxiliaries were excluded as their activity does not include record-keeping.
HCPs, healthcare providers; NA, not applicable; OHPs, other healthcare providers.
*Within the responders; **within the responders of each professional group.

positive PCC attitudes (OR: 2.53; 95% CI: 1.21–5.30; $p = 0.014$), predicted documenting outpatient smoking status. Being a non-smoker was the only factor significantly associated with documenting inpatient smoking status (OR: 2.50; 95% CI: 1.39–4.50; $p = 0.002$). Documenting tobacco use diagnosis and cessation advice was underreported by all HCPs. Smoking behaviour was the most important factor influencing tobacco use record-keeping (DS OR: 0.36; 95% CI: 0.15–0.86; $p = 0.021$), followed by gender (males: OR: 2.53; 95% CI: 1.13–5.65; $p = 0.024$) and positive PCC attitudes (OR: 2.71; 95% CI: 0.97–7.56; $p = 0.056$). Being a physician (OR: 2.67; 95% CI: 1.06–6.78; $p = 0.04$) and being aged 45–55 (OR: 2.98; 95% CI: 1.26–7.05; $p = 0.013$) significantly influenced cessation advice recordings in outpatient settings. Gender was the only factor associated with recording cessation advice in inpatient settings (males: OR: 2.29; 95% CI: 1.07–4.89; $p = 0.033$).

Discussion

Although most HCPs had PAs to cessation, most of the hospital framework was not involved in cessation, lacked specific training and were not aware of their training needs. Thus, our study highlights the need to integrate the delivery of multiprofessional team-based cessation care in hospital settings. All HCP reported systematic "Asking" less frequently than "Advising". Additionally, a significant percentage of physicians and nurses failed to report systematic 2As, as recommended in the guidelines (Institute for Healthcare Quality, 2002). National guidelines establish smoking cessation as a priority and highlight the need for systematically documenting smoking status and cessation interventions. Nevertheless, self-reported recording rates are very low. A recent hospital-based multicentre survey has shown that very few Portuguese chest physicians and nurses were engaged in smoking cessation activities (Pascoal & Ravara, 2009). In addition, a recent hospital-based survey in the United Kingdom reported the underuse of 3As (Ask, Advise, Act) by hospital clinicians: low identification of smokers, low cessation advice and failure to refer smokers to UK Stop Smoking Service (Khan & Smith, 2011). Another recent study in Germany also observed failure of cessation practices in a hospital setting (Raupach et al., 2011). Thus, hospital-based HCPs are not aware of or do not follow smoking cessation guidelines. Other studies have identified that HCPs may be reluctant to systematically ask if the patients smoke (Coleman et al., 2000; McEwen et al., 2001; Helgason & Lund, 2002). Additionally, it has been reported that HCPs may be more inclined to assist smokers willing to quit than they are to monitor smoking status and provide opportunistic advice (Coleman et al., 2000; Helgason & Lund, 2002; Balbé et al., 2008). So we may admit that smoking counseling happens especially when the patient raises

the question, or has an obvious tobacco-related disease, or when the smoker has been identified as such by OHPs in the clinical records. Our findings, as in other studies (Mant et al., 2000; Selak et al., 2006; Murray et al., 2008; Wye et al., 2010), show that monitoring smoking status and record-keeping procedures, including tobacco use diagnosis, are one of the weak links in cessation intervention. Identifying smoking status and recording increases the rate of clinical intervention, which has been shown to increase cessation attempts (Raw et al., 1998; Fiore et al., 2008). Automatic electronic medical records and decision-support systems could therefore, as facilitators of systematic interventions, improve hospital-based cessation support (Williams et al., 2005; Koplan et al., 2007). Implementing a tobacco measure in the national hospital quality-of-care standards, as is already the case in the United States, is also a crucial tool (Fiore et al., 2012). As record-keeping was seldom reported, although not having asked the further steps of the "5As", we may assume that HCPs often downplay effective cessation support, as recent research has shown (Schnoll et al., 2006; Balbé et al., 2009; Tong et al., 2010; Khan & Smith, 2011). Hospital quality assessments should audit smoking status documentation, delivery of effective cessation counseling and post-discharge support (Fiore et al., 2012). In addition, the use of health information technologies and tools, including electronic clinical records, and clinical outcomes assessment should be strongly encouraged, in order to reorient health services from individual treatment approaches to health promotion, quality of care evaluation and cost-effective public health services (Towle, 1998; Whitehead, 2004). Reporting self-confidence and PAs to proactive counseling and being a physician or a non-smoker were the factors that most influenced cessation practices. Physicians' collaboration rate in the survey was the lowest of all HCPs, so we may admit that the responders represent those with best practices and thus physicians' practice quality may be overestimated. Although physicians do play a key role in cessation (Fowler, 1997; Gorin & Heck, 2004), nurses and OHPs should be involved and trained in cessation, as they help to identify more smokers and reinforce physicians' counseling. This team approach may increase cessation attempts (Gorin & Heck, 2004; Fiore et al., 2008; Tong et al., 2010). Undergraduate and continuing medical education should promote inter-professional care and teamwork. We were somewhat surprised to find that most HCPs reported self-confidence and were not aware of their training needs, especially because the majority did not report having received any specific training on cessation. A recent study in Portugal also highlighted the lack of training on smoking prevention and cessation among hospital-based physicians and nurses (Ramos et al., 2010). Other studies have assessed high levels of self-confidence to intervene in smoking cessation among HCPs and also underlined the need for formal training (Pizzo et al., 2003; Hodgetts et al., 2004; Willaing & Ladelund, 2004; Perrin et al., 2006). A recent study in a German hospital reported 'severe misperceptions regarding the effectiveness of cessation methods. . . with "willpower" being thought to be most effective in achieving abstinence' (Raupach et al., 2011, p. 334). Thus, we believe that many HCPs may overestimate their skills and underestimate the need for scientific knowledge and training on cessation. We also conclude that the predominant subjective norm is that smoking is not considered a disease and cessation practices are not considered evidence-based medicine. This may be related to the lack of curriculum development on clinical preventive skills and health behaviour change in most medical and health science schools. Undergraduate training was the most important predictor of proactive counseling attitudes and self-confidence, which were among the factors that mostly influenced 2As. These findings support the notion that undergraduate core skills in preventive medicine and health behaviour change are top priorities, especially if we wish to shape attitudes and influence the subjective norm, and inculcate the core roles of preventive care.

In contrast, as McEwen and West (2001) reported, no significant association was observed between graduate training and cessation attitudes and behaviour. In our sample, graduate training was reported by a small number of HCPs and this may have contributed to non-significant associations. In addition, our study did not specify the type and quality of training, which are, in fact, difficult variables to categorise, especially in a self-reporting survey. Nevertheless, Willaing and Landelund (2004) did find a significant association between graduate training and cessation variables in a hospital setting. Kisuule et al. (2010) performed a pre-post study and concluded that training hospital-based HCPs had a significant positive effect on cessation practices. Moreover, lack of adequate training in cessation may also contribute to high smoking rates among hospital staff and thus negatively affect cessation counseling (Nardini et al., 1998; Pizzo et al., 2003; Willaing & Landelund, 2004). Therefore, continuing education should also be addressed and stimulated by hospital administrations and healthcare systems. Finally, as observed by Barengo et al. (2005), Kawakami et al. (1997) and Willaing and Landelund (2004), smokers reported less involvement with cessation and were less aware of training needs. Health education and cessation programs should be offered to hospital staff and health sciences students. CT programs should involve the whole healthcare team. Tobacco treatment experts should be responsible for regular training and continuing education of hospital-based HCPs. Health administrators should provide and enable adequate resources (Raw et al., 1998). It is very important that hospitals exchange information on these issues, aiming at setting up a nation-wide programme, involving multiprofessional HCPs associations, hospital administrations and the larger community.

Study limitations and strengths

Our study is a descriptive exploratory study in a single medical centre and therefore is not a national representative sample. However, most HCPs working in this hospital, especially nurses and physicians, have studied and worked in other major hospitals all over the country. We did not randomly sample HCPs. This and the 50.5% response rate are major limitations. Sample selection bias and non-response bias, especially among physicians, should be considered. Usually, responders represent the most interested on the subject and those with the best practices. Thus, we may even admit worse cessation performance among HCPs. Nevertheless, our study has one of the highest participation rates among Portuguese hospital-based surveys. Our study was a questionnaire-based cross sectional survey, not allowing for causal inferences. Measurement errors and socially desirable answers should also be considered. Despite these limitations, this study is one of the few to survey smoking cessation in a hospital setting involving multiprofessional HCPs.

Conclusions

The findings suggest that there is reason to doubt that smoking cessation practices are being undertaken effectively. Hospitals should audit smoking status recording, delivery of effective cessation advice and post-discharge support. Cessation indicators should become mandatory in all healthcare settings. Undergraduate and graduate cessation training must be given higher priority, in order to achieve these goals. Our findings also point clearly to the importance of further research on smoking cessation in hospital settings.

Declaration of interest

The authors report no conflicts of interest.

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3.3 Smoking behaviour trends among Portuguese physicians: are they role models? A conference-based survey.

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Short Communication

Smoking behaviour trends among Portuguese physicians: are they role models? A conference-based survey

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Introduction

Tobacco is the single most preventable cause of premature death and a leading cause of disease and disability.[1] One of the most powerful tobacco control tools is to decrease tobacco use by physicians and other healthcare providers (HCPs) and engage them in tobacco control activities. All HCPs, and specially physicians, can be positive role models as non-smokers and promote smoking cessation.[1–4] In recent decades, the worldwide rate of smoking among physicians has declined. Nevertheless, physicians smoking rates remain high in several developed and in developing countries, including Eastern and Southern Europe.[2,3] Although WHO has stressed the importance of surveying tobacco use among HCPs, few studies have compared smoking behaviour trends among physicians with the general population, according to gender, age and education. In addition, past research has reported difficulties in surveying physicians, since collaboration is often rather poor.[4] Portugal has been categorized as a country with medium/low tobacco control activity.[4] This limits the capacity of curbing the epidemic,[1] and recent studies have reported raising smoking rates among youth and females.[5] Moreover, while several studies have reported decreasing smoking trends among Portuguese physicians,[4] it is not clear if they are smoking less than the general population or whether this is a sustained trend. This study explores smoking behaviour among Portuguese physicians and addresses the research question: Do Portuguese physicians act as role models by smoking less than the general population or reporting willingness to quit? This was an exploratory questionnaire-based cross-sectional study conducted in 2009 during two major national medical conferences, and reproducing previous survey methodology.[3–7] Self-administered questionnaires were delivered and collected during the Stroke Society Annual Conference (all 450 physicians in attendance) and the GP Society Annual Conference (33% systematic random sample out of 1500 participants); targeting GPs, hospital-based specialists (Hs), and medical students/recent graduates (SRGs). Approval for the survey was obtained from the conference board committees and the Research Ethics Committee of the University-Hospital of Beira Interior. Overall response rate was 64%. Of the 608 participants, 58.4% were GPs; 32.4% Hs, 9.2% SRGs; 62.7% were females; mean age was 39.1 ± 12.9 years (95%CI: 39.5–42.9; range: 21–70). Smoking behaviour trends were compared between physicians and the more highly educated general population, using the same

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survey tools and data from a computer-assisted population-based telephone-interview survey conducted in 2012 (national-random sample stratified by residence/gender/age).[5] To compare physicians with the general population, the 'kunze ratio' was calculated,[3] i.e. the ratio of smoking prevalence among physicians to the prevalence in the general population, by gender and age (<45/≥45years). For quitting trends the quit rate (former smokers/ever smokers) by gender and age was compared; and calculated the quitting ratio, i.e. physicians' quitting rate/general population quitting rate.[7] Table 1 depicts physicians' smoking behaviour trends and comparisons with the general population.

Physicians' smoking behaviour general trends

The findings of this study suggest that smoking prevalence among Portuguese physicians has sharply decreased over the last decades. The overwhelming majority of young physicians reports being never smokers, in contrast to their elders, indicating reduced uptake of smoking. Analysis of physicians' quitting behaviour confirms that the majority of smokers quit in middle age, independently of gender. In addition, younger physicians report more occasional smoking than the general population, independently of gender, suggesting a switch to different consumption patterns. Nevertheless, the authors identified high smoking prevalence among Portuguese physicians and occasional smoking as an emergent trend, associated with low motivation to quit (30.7% of all smokers and 43.1% of daily smokers reported willingness to quit). In fact, the prevalence of smoking among Portuguese physicians has gradually declined over the past 40 years from considerably higher rates than the general population to around 20%.[3,4,8] Despite this downward trend, smoking rates seems to have flattened out since 2000. Moreover, smoking rates remain high, especially when comparing Portugal with countries where tobacco control progress and physicians' commitment to tobacco control are strongest.[2] Similarly, recent European studies have also reported high smoking prevalence among physicians, HCPs and medical students.[2,4,9]

Comparison with the general population, gender trends and emergent patterns

Comparison with the general population identified two distinct gender-related patterns: 1) young male physicians report a lower uptake of smoking than the general population, contrasting with their elders. Male physicians report similar tobacco consumption and lower quitting rates in both age groups. Moreover, they stop smoking later than the general population; 2) female physicians report a lower uptake of smoking and lower smoking rates than the general population in both age groups. They also report similar quitting rates and quitting-age trends to those of the general population. Older female physicians report lower cigarette consumption than the general population, while younger ones report similar consumption levels. It is, however, more difficult to interpret the smoking trend among female physicians. In Portugal, male physicians have consistently reported significantly higher smoking rates than female physicians.[8] Surprisingly, the trend among the general population is precisely the opposite with more highly educated women now smoking about the same as men.[5] This HCPs' gender-pattern also contrasts with other southern European countries, where smoking rates among female HCPs are about the same or higher than among males.[2] It should nevertheless be emphasized that smoking among women is steadily increasing in all age groups in Portugal,[5] what may eventually lead to higher smoking rates among female doctors. This calls for continuous close monitoring.

Concluding remarks and implications for tobacco control and medical education

High smoking rates among physicians are of concern because of the counter-example they set for patients and the general population. This substantially influences smoking social norms, specifically the perception that it is less harmful and relatively acceptable.[2,3] On the other hand, high smoking rates among physicians indicate that the smoking epidemic remains at an immature stage in Portugal. Consequently, smoking rates among the general population will not level off, unless comprehensive tobacco control policies are implemented.[2,3] Furthermore, smoking physicians will be less likely to intervene in smoking cessation and actively participate in tobacco control advocacy.[2–4] It is also worth noting that occasional smoking was identified as an emerging consumption pattern correlating significantly with unwillingness to quit. Although occasional smoking may reflect tobacco hazard awareness, this behaviour still endangers health, since there is no safe consumption level.[10] This false belief that occasional smoking is safe may perpetuate physicians' smoking and consequently reflect on society at large, undermining cessation and tobacco control progress. Moreover, recent research reports that occasional smoking is an emergent pattern of the general population and that it is difficult for these smokers to quit.[5,10] Overall, it has been found that the physicians continue to underestimate tobacco hazards and the importance of their example as non-smokers and role-models. In addition, most physicians, including students, report lack of cessation support in their workplaces (GPs: 51.3%; Hs: 65.3%; SRGs: 60.7%; $P < 0.001$). Moreover, as previously reported,[4] only a minority (20.5%) consider needing cessation support, suggesting that they underestimate how highly addictive tobacco is. Additionally, half of all physicians become regular smokers while at medical school and this has been the case for some time (52.8% aged <45 and 52.3% aged ≥45). These findings further emphasize the medical education gap concerning tobacco health hazards, tobacco dependency and the role of physicians in tobacco control. Moreover, this study points out that smoking is not being prevented among medical students and that this should be an important goal of medical education.

Main limitations

The main limitation of this study should be discussed as: sample-selection bias due to the convenience-sample

Table 1 – Physicians' smoking behaviour by age, gender and specialty, and tobacco consumption patterns. Physicians/general population comparisons.

Smoking behaviour		Smokers		Ex-smokers		Never-smokers		Total	Tobacco consumption cig per day			Consumption pattern*		
		n(%)	95%CI	n(%)	95%CI	n(%)	95%CI	n	Mean/Median	95%CI	MW P value		Daily n(%)	Occasional n(%)
Males**	<45 y	38(31.9)	23.5–40.3	6(5.0)	1.1–8.9	75(63.0)	54.3–71.7	119	13.5/15.0	11.2–15.9	<45 y/≥45 y			
	≥45 y	28(25.9)	17.6–34.2	43(39.8)	30.6–49.0	37(34.3)	25.4–43.3	108	13.5/13.5	9.2–17.8	0.783(males)	<45 y	31(39.7)	47(60.3)
	Total	66(29.1)	23.2–35.0	49(21.6)	16.3–27.0	112(49.3)	42.8–55.8	227	13.5/15.0	11.4–15.7		≥45 y	34(69.4)	15(30.6)
Females**	<45 y	40(16.0)	11.5–20.5	17(6.8)	3.7–9.9	193(77.2)	72.0–82.4	250	11.0/10	8.5–13.5	0.949(females)	Total	65(51.2)	62(48.8)
	≥45 y	21(16.0)	9.7–22.3	39(29.8)	22.0–37.6	71(54.2)	45.7–62.7	131	12.4/10	8.7–16.1	male/female			
	Total	61(16.0)	12.3–19.7	56(14.7)	11.1–18.3	264(69.3)	64.7–73.9	381	11.7/10	9.6–13.9	0.107*	Crude OR occasional smoker		
Both**	<45 y	78(21.1)	16.9–25.3	23(6.2)	3.7–8.7	268(72.6)	68.1–77.2	369				3.4 (95%CI: 1.6–7.3)		
	≥45 y	49(20.5)	15.4–25.6	82(34.3)	28.3–40.3	108(45.2)	38.9–51.5	239				Reference category: ≥45 y		
	Total	127(20.9)	17.7–24.1	105(17.3)	14.3–20.3	376(61.8)	57.9–65.7	608						
Specialty ±														
GPs		72(20.4)	16.2–24.6	73(20.7)	16.5–24.9	208(58.9)	53.8–64.0	353						
Hs		42(21.4)	15.7–27.1	30(15.3)	10.3–20.3	124(63.3)	56.6–70.1	196						
SRGs		12(21.4)	10.7–32.1	1(1.8)	1.7–5.3	43(76.8)	65.7–87.9	56						

Physicians/general population comparisons

Prevalence and quitting	Males			Females			Factors associated with physicians willingness to quit			
	<45 y	≥45 y	Total	<45 y	≥45 y	Total		aOR	95%CI	Wald P value
Kunze ratio	1.04	1.34	1.10	0.60	0.56	0.59				
Quit rates (%)							Being a daily smoker	3.35	1.45–7.74	0.005
Phy	13.6	60.5	42.6	29.8	60.5	47.8	Graduate training >5 h	2.54	1.07–6.06	0.035
Pop	42.9	71.1	55.2	28.6	56.1	42.2				
Phy/Pop quit ratio	0.77	0.85	0.77	1.04	1.08	1.13				

Quitting age (y)	Males	Females	MW P value male/female
Phy			
Mean/Median	39/39	31.9/28.5	
95% CI	35.8–42.2	29.1–34.7	0.001
Pop			
Mean/Median	32.6/30.0	34.2/32.0	
95% CI	29.6–35.7	30.2–38.2	0.495

aOR – adjusted OR derived from MLR adjusted for gender, age (<45 y/≥45 y), specialty (GPs vs Hs), consumption pattern (daily vs occasional), specific training in smoking prevention/cessation (graduate and undergraduate: yes/no), role model attitudes to being non-smokers (most positive vs less positive). CI – confidence intervals. GPs – General practitioners; Hs – Hospitalists; MLR – multiple logistic regression; MW – Mann–Whitney test; OR – odds ratio; Pop – general population with university degree; Phy – physicians; SRGs – medical students and recent graduates; y – years. ± 3 missing. **P < 0.001; *P = 0.001. Note: General population sample with university degree (n = 324); 54.3% female; mean age 41.2 ± 15.4 ys (95%CI: 38.1–40.1; range: 18–89 ys).

design. When comparing physicians' data with the general population, further bias should be admitted, as information gathering and collaboration rates differ among surveys and study populations are potentially different. The cross-sectional nature of the study does not allow assessing trends over time or causality. Questionnaires may suffer from measurement and social desirability bias, especially due to smoking underreporting among physicians. Non-response bias should be considered, since high nicotine dependence was not reported, suggesting that more dependent smokers did not return the questionnaire. Thus higher smoking rates among Portuguese physicians should be admitted. Similarly, occasional smokers may be over-estimated. Despite these limitations, this study is one of the few that has analysed smoking behaviour among Portuguese physicians and obtained satisfactory response rates. Additionally, this study is one of the few that has compared physicians' smoking trends with the higher education bracket of the general population, allowing a better estimate of whether physicians are role models. Finally, the authors used survey tools that have not been often used. Thus they should be disseminated in other countries to evaluate smoking behaviour trends among physicians/HCPs and to compare them with the general population.

Conclusions

Although the findings suggest that smoking prevalence among Portuguese physicians is decreasing, smoking rates remain high. Physicians' smoking behaviour trends do not significantly differ from those of the general population. Moreover, few physicians who smoke report willingness to quit. These findings do not correlate with expected status as role models. Preventing smoking in medical schools and promoting smoking cessation among HCPs should be top priorities. In addition, implementing comprehensive tobacco control policies and medical education on tobacco control remain major challenges.

Author statements

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Ethical approval

The study received ethics approval from the Research Ethics Committee of the University Hospital of Beira Interior University.

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Authors' contributions

SBR conceived the study and gathered the information, completed data entry, data analysis and drafting of the manuscript. All authors participated in the design of the study, analysed and interpreted the data, critically reviewed the original draft and read and approved the final manuscript. SBR and JMC coordinated the study design. PA coordinated the statistical analysis.

Competing interests

None declared.

List of abbreviations

CI	confidence interval
GPs	general practioners
HCPs	healthcare providers
Hs	hospital-based specialists
SRGs	medical students and recent graduates
WHO	World Health Organisation

Appendix A. Supplementary data

Supplementary data related to this article can be found online at http://dx.doi.org/10.1016/j.puhe.2013.08.015.

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Are physicians aware of their role in tobacco control? A conference-based survey in Portugal

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Abstract

Background: The crucial role of physicians in tobacco control (TC) is widely recognized. In 2008, Portugal implemented a non-comprehensive smoke-free policy (SFP). In 2009, a conference-survey was carried out to explore Portuguese physicians' engagement in tobacco control, by evaluating the following: 1) attendance at TC training and awareness of training needs; 2) participation in TC activities; 3) attitudes and beliefs regarding SFPs.

Methods: Questionnaire-based cross-sectional study conducted during two major national medical conferences targeting GPs, hospitalists, and students/recent graduates. Descriptive analysis and logistic regression were performed.

Results: Response rate was 63.7% (605/950). Of the 605 participants, 58.3% were GPs, 32.4% hospitalists, 9.3% others; 62.6% were female; mean age was 39.0 ± 12.9 years. Smoking prevalence was 29.2% (95% CI: 23.3-35.1) in males; 15.8% (95% CI: 12.1-19.5) in females, $p < 0.001$. While the overwhelming majority of physicians strongly agreed that second-hand smoke (SHS) endangers health, awareness of SFP benefits and TC law was limited, $p < 0.001$. A significant minority (35.5%) believed that SHS can be eliminated by ventilation systems. Most physicians lacked training; only a minority (9.0%) participated regularly in TC. Training was the most consistent predictor of participation in TC. General agreement with SFP was high; but significantly lower for indoor leisure settings, outdoors bans in healthcare/schools settings and smoking restrictions in the home/car, $p < 0.001$. Smoking behaviour strongly predicted support for smoking restrictions in restaurants and bars/discos, healthcare outdoors and private settings.

Conclusions: The findings suggest that Portuguese physicians are not aware of their role in tobacco control. Poor engagement of physicians in TC may contribute to the current lack of comprehensive policies in Portugal and Europe and undermine social norm change. Medical and professional continuing education on tobacco control should be made top priorities.

Keywords: Tobacco control, Smoking, Physicians, Doctors, Smoke-free policies, SHS, ETS, Training

Background

The tobacco epidemic continues to expand globally and remains a leading cause of morbidity and premature death [1]. The World Health Organization (WHO) estimates that tobacco use and exposure to second-hand smoke (SHS) will cause over 8 million deaths in 2030 unless urgent action is taken [2]. Tobacco remains, however, the most readily preventable cause of death. In order to curb the pandemic, WHO recommends the implementation of comprehensive tobacco control (TC) policies, including price policies, and smoke-free policies (SFPs); bans on tobacco advertising, promotion and sponsorship; health education on the hazards of tobacco use and access to tobacco dependence treatment; regulation of tobacco products and other evidence-based interventions. These are based on the WHO Framework Convention on Tobacco Control (WHO-FCTC) [2]. Currently, all EU countries have ratified the WHO-FCTC. Despite this commitment, most European countries have failed to implement comprehensive policies due to tobacco industry interference in policy-making and inconsistent advocacy; underfunding and poor enforcement of TC policies [3-6].

In fact, TC progress remains deadly slow in several European countries such as Portugal [3,6]. In January

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2008, Portugal enacted a TC law [7]. A non-comprehensive and poorly-enforced smoke-free policy (SFP) was implemented disregarding FCTC guidelines. Many exemptions apply, particularly in hospitality venues, and frequent breaches have been reported [8,9]. The role of healthcare professionals (HCPs) and its organizations has been highlighted by the WHO. Among HCPs, TC efforts should discourage tobacco use, disseminate TC training and promote smoke-free environments and other evidence-based strategies. Similarly, physicians should publicly lead TC advocacy and monitor policy impact over time [10,11]. The roles of physicians as both exemplars and leaders are, moreover, crucial to the TC movement and to social norm change. Note too that TC progress has been greater in countries where few physicians smoke and their commitment to public health policy is strongest [10,12]. Given this evidence, physicians' TC awareness and training should be top priorities. Although this matter is a TC and a research relevant goal, knowledge gaps persist. This may be partially explained by the fact that surveying physicians is particularly challenging. In survey research, physicians have been appointed as a professional group from which it is difficult to obtain collaboration. Low response rates reduce sample size and can allow non-response bias and uncertainty regarding the survey findings [13,14]. Several authors have consistently reported low response rates when surveying Portuguese physicians' smoking behaviour and TC attitudes and practices [15-18]. The Portuguese tobacco law highlights the need to engage all HCPs, and particularly physicians, with TC activities, including training [7]. To date, little information is available concerning this requirement's implementation. In 2009, a conference-survey was carried out to explore Portuguese physicians' smoking behaviour trends and their engagement in tobacco control [19]. The purpose of the present study was to explore Portuguese physicians' engagement in TC, by evaluating the following issues: 1) attendance at TC training and awareness of training needs; 2) participation in TC activities; 3) attitudes and beliefs regarding SFPs/SHS; and support for comprehensive SFPs. Additionally, the study aimed to identify factors associated with physicians' participation in TC and their support for comprehensive SFPs.

Methods

Study design, study population, site and sampling, ethical approval

This was an exploratory cross-sectional study, conducted in 2009 during two major national medical conferences using a purposive-sampling procedure, and following Nardini et al's methodology [20]. All data were self-reported. Self-administered questionnaires were delivered and collected during conferences targeting general practionners (GPs), hospital-based physicians or hospitalists, and undergraduate medical students and recent-graduates (SRGs). These conferences were the following:

1. Portuguese Stroke Society Annual Conference where questionnaires were distributed to all registered physicians (n = 450);
2. Portuguese GP Society Annual Conference where questionnaires were distributed to a systematic random sample of the attendees (33% out of 1500; n = 500).

GPs should be more engaged with tobacco control activities, according to national and international guidelines [7,21]. In order to contrast GPs with hospital-based physicians, and to include physicians from all over the country with a wide range of age and professional development, this setting was selected. The theoretical sample size was 500 physicians assuming an expected smoking prevalence of 22.0% [22], with a 95% confidence interval (CI) and a precision of 3.6%. A total of 950 questionnaires were delivered, assuming an expected response rate of 60% [20]. The questionnaire included a cover letter explaining the study's aims, the institutions involved, the researchers' contact details and guarantees as to anonymity. Approval for the survey implementation was obtained from both conferences board committees. The organizing committees were previously contacted, in order to sound about the characteristics of attendees (number, specialty, and region). The study was approved by the Beira Interior University-Hospital Research Ethics Committee.

Questionnaire and measures

Physicians' beliefs and attitudes to SFP were the main outcomes, as those measures are strongly associated with tobacco social norms [23]. Additionally, physicians' participation in TC was assessed. A validated questionnaire was adapted [16]. Additional items were developed addressing TC attitudes and beliefs and pilot tested among a small group of GPs, hospitalists and SRGs. The questionnaire collected standard information on socio-demographics and specialty. The second part of the questionnaire explored smoking behaviour, attitudes to being role-models (RMs) as non-smokers (RM attitudes) and smoking in private settings. The third part addressed TC practices, attitudes and beliefs, and training in smoking prevention/treatment. Smoking status was self-reported and categorized according to WHO guidelines for tobacco use [24]. Smoking in private settings was assessed by the following questions: Do you usually smoke 1) in the home 2) in the car? Answer: never (0); yes, only at an open window (1); yes, sometimes (1); yes regularly (1). Specific training in smoking prevention/cessation was assessed as undergraduate (UGT) or graduate

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(GT) and quantified in hours (h): (<5 h; 5–8 h; >8-12 h; >12 h). Physicians' TC practices were assessed by the following question: Do you participate in or have you ever participated in 1) smoking prevention/TC activities 2) smoking cessation activities? Answer: regularly (1); occasionally (1); never (0). Response categories were re-coded and dichotomized into "no" (0) and "yes" (1). TC attitudes and beliefs were assessed by four items:

1. Awareness of training needs. Question: Do you consider that you need specific training in smoking prevention/treatment?
2. SHS and SFP beliefs. The wording of questions is shown in the Results section (see tables).
3. Smoking restrictions in private settings. Questions: Do you allow smoking 1) in your home 2) in your car?
4. Support for SFP in public settings. Question: Please state your agreement regarding smoking restrictions in the following settings.

Response options to item 1 and 3 were dichotomized (yes/no). Answers to items 2 and 4 were scored on a three-point and a four-point scale, depending on the contents; answer categories and re-codification is shown in data analysis and Results sections (see tables).

Data analysis

Categorical variables are presented as absolute and relative frequencies with 95% CI, while quantitative variables are presented as mean and standard deviation (SD). Bivariable analyses were conducted using chi-square, McNemar, and Man-Whitney tests, and crude odds ratio (OR) where suitable. All associations between variables of interest were tested. Statistical analyses were conducted using SPSS-19 statistical software. A two-sided p value < 0.05 was considered to be statistically significant. Multiple logistic regression analysis (MLR) was conducted to investigate factors associated with training needs awareness (1-yes/0-no), participation in TC activities (1-yes/0-no) and strong support for SFPs (1-strongly agree/0-others). Never smokers and ex-smokers were aggregated as non-smokers. The following independent variables were tested in the bivariable analysis and included in the MLR-models: gender (male/female), age (<45/≥45 years), specialty (GPs/hospitalists), GT/UGT attendance (1-yes/0-no); RM attitudes as non-smokers (1-most positive/0-others), SHS beliefs (SHS is the major indoor pollutant: 1-strongly agree/0-others; ventilation is effective for eliminating SHS: 1-strongly disagree; disagree/0- others); smoking behaviour (smokers/non-smokers) and having a smoke-free home/car (allowing smoking in the home/car: 0-yes/1-no). A backwards stepwise procedure was set at the 0.05 significance level. Results were presented as adjusted ORs (aORs) with 95% CIs.

Results

Response rate and socio-demographics

Overall response rate was 63.7%: 605/950. Of the participants, 62.6% (379) were female; 58.3% (353) GPs, 32.4% (196) hospitalists, and 9.3% (56) medical students and recent graduates; mean age was 39.0 ± 12.9 years (range: 21–70). Hospitalists include 3 main specialities: internal medicine (n = 90);, neurology (n = 54); rehabilitation medicine and others (n = 52). GPs were significantly older than hospitalists (mean age ± SD: 42.1 ± 12.6 versus 37.7 ± 12.2 years; $p < 0.001$).

Smoking behaviour and smoking restrictions in private settings

Smoking behaviour trends were analysed elsewhere [19]. Smoking prevalence was 29.2% (CI: 23.3-35.1) in males; and 15.8% (CI: 12.1-19.5) in females, $p < 0.001$. Current smoking was similar among GPs, hospitalists and SRGs [19]. Of the smokers, 52.4% (95% CI: 43.7-61.1) admitted smoking in the home and 46.8% (95% CI: 38.1-55.5) in the car (26.2% did not answer). Smoking restrictions in the home were significantly less reported than in the car: 76.5% (95% CI: 73.12-79.88) versus 84.0% (95% CI: 81.08-86.92); $p < 0.001$; (2.8% and 3.1% respectively did not answer).

Training in smoking prevention/cessation

Participants' attendance at UGT or GT is shown in Table 1. The great majority of physicians reported little or no UGT, particularly the older ones. Of those who reported UGT, 56.6% (95% CI: 49.2-63.9) have received less than 5 hours; 15.0% (95% CI: 9.7-20.3) more than 12 hours (not shown). About half of GPs reported GT, contrasting with hospitalists. Of those participants reporting GT, 40.6% (95% CI: 34.4-46.8) received less than 5 hours; 29.5% (95% CI: 23.8-35.2) more than 12 hours (not shown). Awareness of training needs was more frequently reported by GPs, non-smokers, under-45s, those reporting GT and females (Table 1). Workplace training programmes were reported more often by GPs than hospitalists (OR: 3.6; 95% CI: 2.4-5.4; $p < 0.001$) (not shown).

Tobacco control activities

Table 2 presents physicians' participation in TC activities. Of the responders, around 9.0% reported participating regularly in TC activities [smoking prevention: n = 53 (8.8%; CI: 6.5-11.1%); smoking cessation: n = 33 (5.5%, CI: 3.3-6.7%)]. GPs reported being involved in TC more often than hospitalists, $p < 0.001$. Participation in TC activities

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Table 1 Tobacco control training attendance; awareness of training needs and associated factors

Training	Yes n(%)	95% CI	No n(%)	95% CI	Miss n(%)	Total(n)	p value	Crude OR	95% CI	p value
UGT <45 ys	155(42.0)	37.0-47.0	212(57.5)	54.5-64.5	2(0.5)	369		*UGT*		
UGT ≥45 ys	18(7.6)	4.2-11.0	217(91.9)	88.4-95.4	1(0.4)	236		8.8	5.2-14.8	<0.001
UGT Overall	173(28.6)	25.0-32.0	429(70.9)	67.3-74.5	3(0.5)	605	<0.001	*Refer:* ≥45 ys		
GT-GPs	188(53.3)	48.1-58.5	164(46.5)	41.3-51.7	1(0.3)	353		*GT*		
GT-Hs	42(21.4)	15.7-27.1	152(77.6)	71.8-83.4	2(1.0)	196		4.2	2.8-6.2	<0.001
GT-overall	230(41.9)	37.8-46.0	316(57.6)	53.5-61.7	3(0.5)	549	<0.001	*Refer: Hs*		
Training Awareness	***Yes n(%)***	***95% CI***	***No n(%)***	***95% CI***	***Miss n(%)***	***Total(n)***	***Ass factors***	**aOR**	**95% CI**	**P value**
GPs	239(67.7)	62.8-72.6	112(31.7)	26.9-36.6	2(0.6)	353	GP	4.2	2.7-6.6	<0.001
Hs	87(44.4)	37.4-51.4	101(51.5)	44.5-58.5	8(4.1)	196	Non-smoker	2.7	1.7-4.3	<0.001
SRGs	39(69.6)	57.6-81.7	17(30.4)	18.4-42.5	0(0)	56	<45 ys	2.3	1.5-3.4	<0.001
Overall	365(60.3)	56.4-64.2	230(38.0)	34.1-41.9	10(1.7)	605	GT	2.0	1.3-3.0	0.001
							Female	1.5	1.0-2.2	0.035

Ass: associate; CI: confidence interval; GPs: General practitioners; GT/UGT: graduate/undergraduate training; Hs: Hospitalists; miss: missing values; OR: odds ratio; SRG: medical students/recent graduates; ys: years; aOR: OR adjusted for gender, age (<45/≥45 years), specialty (GP/Hs), smoking behaviour (smoker/non-smoker), GT/UGT (yes/no) and RM attitudes (most positive/others).

was predicted by reporting GT or more favourable RM attitudes, being a GP or under 45 (see Table 2).

Tobacco control beliefs

Table 3 depicts awareness of the TC law; perception of compliance with SFP; and SFP/SHS beliefs; contrasting smokers with non-smokers. Most physicians strongly agreed that SHS is harmful (88.8%), although only half strongly reported being the major indoor pollutant (51.2%), $p < 0.001$; about half totally agreed that SFPs could reduce tobacco consumption (52.5%) and disease burden (52.9%), $p < 0.001$; over 1/3 were fully aware of the TC law (35.9%), $p < 0.001$; in addition, 35.5%, $p < 0.001$, totally agreed that SFPs could help smokers to quit; and 33.7% believed that SHS could be eliminated by ventilation. Smokers believed more often that ventilation could eliminate SHS and were less likely to report low compliance with the ban. Reporting favourable RM attitudes or extensive GT (>5 hours) and being a non-smoker (Tables 2 and 3) or female were significantly and positively associated with some TC beliefs, but not all (not shown).

SFP support

Table 4 depicts support for SFP in public settings by smoking behaviour. Strong support for SFP were reported, respectively in healthcare premises (94.7%), schools (94.4%), public administration buildings (91.4%), and workplaces (89.9%); but significantly less support was observed in leisure settings such as restaurants (70.2%), shopping malls (64.1%), and bars and discos (55.0%), $p < 0.001$. In addition, strong support for outdoors bans was lower, respectively in healthcare settings (58.7%) and schools (52.6%), $p < 0.001$. Being a non-smoker was significantly associated with stronger support for SFP in all settings, with exception of healthcare indoors. Table 5 shows factors associated with

Table 2 Prevention and cessation activities participation and associated factors (N = 602)*

Prevention/TC	Yes n; %	95% CI	No n; %	95% CI	Total	*Ass factors*	OR; 95% CI	p value	aOR;95% CI	p value	MLR model
GPs	200; 56.7	51.5-61.9	153; 43.3	38.1-48.5	353	GT	6.0; 4.2-8.7	<0.001	5.0; 3.4-7.5	<0.001	*72.4%; p < 0.001*
Hs	45; 23.2	17.3-29.1	149; 76.8	70.9-82.7	194	GP	4.3; 2.9-6.4	<0.001	2.8; 1.8-4.3	<0.001	
SRGs	19; 34.5	21.9-47.1	36; 65.5	52.9-78.1	55	RM	1.7; 1.2-2.4	0.001	1.6; 1.1-2.4	0.014	
Total	264; 43.9	39.9-47.9	388; 56.1	52.1-60.1	602						
Cessation	**Yes n; %**	**95% CI**	**No n; %**	**95%CI**	**Total**	***Ass factors***	**OR; 95% CI**	**p value**	**aOR;95% CI**	**p value**	**MLR model**
GPs	150; 42.5	37.3-47.7	203; 57.5	52.3-62.7	353	GT	4.3; 3.0-6.2	<0.001	4.1; 2.7-6.2	<0.001	73.1%; p < 0.001
Hs	27; 13.9	9.0-18.8	167; 86.1	81.7-91.3	194	GP	4.6; 2.9-7.3	<0.001	3.8; 2.3-6.3	<0.001	
SRG	19; 34.5	21.9-47.1	36; 65.5	52.9-78.1	55	≤45 yrs	1.3; 0.9-1.8	0.180	2.2; 1.4-3.4	<0.001	
Total	196; 32.6	28.9-36.3	406; 67.4	63.7-71.1	602	RM	1.9; 1.3-2.6	<0.001	1.8; 1.2-2.6	0.007	

Ass: associated; CI: confidence interval; GPs: General practitioners; GT/UGT: graduate/undergraduate TC training; Hs: Hospitalists; yrs: years; MLR: multiple logistic regression; OR: odds ratio; RM: attitudes to being role model as a non-smoker; SRG: medical students/recent graduates; TC: tobacco control; aOR: OR adjusted for gender, age (<45 ys/≥45 ys), specialty (GP/Hs), smoking behaviour (smoker/non-smoker), receipt of GT/UG (yes/no) and RM (most positive/others). *3 (0.5%) missing.

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Table 3 Second-hand smoke and smoke-free policy beliefs by smoking behaviour

	Totally agree		Partially agree		Disagree					
SFP beliefs	*NS*	*Smokers*	*NS*	*Smokers*	*NS*	*Smokers*	p-value		OR; 95% CI	Total; miss
Comprehensive SFP:	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)				N;n (%)
Helps smokers reduce consumption	250 (52.2)	65 (51.6)	196 (40.9)	50 (39.7)	16 (3.3)	8 (6.3)	0.318			585; 20 (3.3)
Helps smokers quit	173 (36.1)	42 (33.3)	221 (46.1)	57 (45.2)	71 (14.8)	22 (17.5)	0.712			586; 19 (3.1)
Reduces TR disease/mortality	255 (53.2)	65 (51.6)	189 (39.5)	44 (34.9)	26 (5.4)	13 (10.3)	0.116			592,13 (2.1)
I am aware of SFP law	151 (31.5)	66 (52.4)	290 (60.5)	54 (42.9)	3 (2.4)	6.3 (5.5)	<0.001			594; 11 (1.8)
Current SFP is being complied with	80 (16.7)	32 (25.4)	302 (63.0)	64 (50.8)	84 (17.5)	27 (21.4)	0.025		0.59; 0.37-0.94*	589; 16 (2.6)
	Strongly agree		**Agree**		**Disagree**			**Strongly dis**		
SHS beliefs	*Non-smokers*	*Smokers*	*Non-smokers*	*Smokers*	*Non-smokers*	*Smokers*		*Non-smokers*	*Smokers*	OR; 95% CI; p-value	Total;miss
SHS:	n (%)	n(%)	n (%)	n (%)	n (%)	n (%)		n (%)	n (%)		N;n (%)
Endangers health	436 (91.0)	101(80.2)	38 (7.9)	24 (19.0)	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	2.73; 1.57-4.75*	599; 6 (1.0)
										p < 0.001	
Is the major indoor pollutant	257 (53.7)	53 (42.1)	209 (43.6)	61 (48.4)	10 (2.1)	7 (5.6)		0 (0.0)	1 (0.8)	1.53; 1.022.28*	598; 7 (1.2)
										p = 0.037	
Ventilation is effective for eliminating SHS	21 (4.4)	10(7.9)	123 (25.7)	50 (39.7)	256 (53.4)	55 (43.7)		69 (14.4)	9 (7.1)	0.47; 0.32-0.71*	593; 12 (2.0)
										p < 0.001	

CI: Confidence intervals; NS: non-smokers; OR: crude odds ratio; SHS: second-hand smoke; SFP: smoke-free policy. TR: tobacco-related. *Reference: smokers.

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Table 4 Support for comprehensive smoke-free policies in public settings by smoking behaviour

Suport	Strongly agree			Agree		Disagree		Strongly disagree		Total	Missings	Statistical tests
	Non-smokers	*Smokers*		*Non-smokers*	*Smokers*	*Non-smokers*	*Smokers*	*Non-smokers*	*Smokers*	N		
Settings	**n; %**	**n; %**	**OR*; 95% CI p-value***	**n; %**	**n; %**	**n; %**	**n; %**	**n; %**	**n; %**		**n; %**	**McNemar p-value**
Wplaces	447; 93.3	97; 77.0	4.61; 2.59-8.21 p < 0.001	25; 5.2	23; 18.3	1; 0.2	3; 2.4	1; 0.2	1; 08	598	7;1.2	0.345
Public adm	450; 93.9	103; 81.7	3.36; 1.81-6.25 p < 0.001	24; 5.0	19; 15.1	1; 0.2	1; 0.8	1; 0.2	0; 0.0	599	6; 1.0	*Refer*
Health I	458; 95.6	115; 91.3	2.00; 0.91-4.37 p = 0.081	15; 3.1	5; 4.0	2; 0.4	3; 2.4	3; 0.6	2; 1.6	603	2; 0.3	0.009
Health O	312; 65.1	43; 34.1	3.45; 2.27-5.24 p < 0.001	101; 21.1	29; 23.0	60; 12.5	37; 29.4	3; 0.6	12; 9.5	597	8; 1.3	<0.001
School I	459; 95.8	112; 88.9	2.89; 1.34-6.23 p = 0.005	14; 2.9	10; 7.9	1; 0.2	2; 1.6	2; 0.4	0; 0.0	600	5; 0.8	<0.001
School O	274; 57.2	44; 34.9	2.47; 1.63-3.72 p < 0.001	108; 22.5	24; 19.0	77; 16.1	39; 31.0	12; 2.5	15; 11.9	593	12; 2.0	<0.001
Rest	371; 77.5	54; 42.9	4.54; 2.98-6.89 p < 0.001	88; 18.4	42; 33.3	14; 2.9	24; 19.0	1; 0.2	2; 1.6	596	9; 1.5	<0.001
Bars/Disc	297; 62.0	36; 28.6	4.06; 2.64-6.24 p < 0.001	140; 29.2	38; 30.2	35; 7.3	39; 31.0	2; 0.4	10; 7.9	597	8; 1.3	<0.001
Shopping malls	329; 68.7	59; 46.8	2.41; 1.61-3.61 p < 0.001	130; 27.1	48; 38.1	16; 3.3	13; 10.3	2; 0.4	3; 2.4	600	5; 0.8	<0.001

95% CI: 95% confidence intervals; Disc: Discos; I: indoors; *OR: crude odds ratio (regarding strongly agree against the others category responses, reference: smokers); O: outdoors; Public adm: public administrations buildings; Refer: Reference category for comparison (McNemar test); Rest: restaurants; Wplaces: Workplaces. Non-smokers: never-smokers + ex-smokers.

Table 5 Factors associated with strong support for comprehensive smoke-free policy in public settings

Settings	Workplaces	Public adm	Healthcare I	Healthcare O	Schools I	Schools O	Restaurants	Bars/discos	Malls
Ass factors	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**	**OR; 95% CI p-value**
Non-smoker	2.1; 1.1-4.1 p = 0.032	-	-	2.2; 1.4-3.5 p = 0.001	-	1.7; 1.1-2.8 p = 0.031	2.6; 1.6-4.2 p < 0.001	2.6; 1.6-4.1 p < 0.001	-
SF Home	3.6; 1.8-6.9 p < 0.001	2.8; 1.4-5.5 p = 0.003	3.3; 1.5-7.2 p = 0.003	2.9; 1.9-4.6 p < 0.001	2.7; 1.2-6.2 p = 0.021	2.1; 1.3-3.4 p = 0.002	3.1; 1.9-4.9 p < 0.001	2.5; 1.6-3.9 p < 0.001	2.4; 1.5-3.7 p < 0.001
RM attitudes	6.0; 2.3-15.9 p < 0.001	2.2; 1.0-4.7 p = 0.045	-	2.3; 1.6-3.3 p < 0.001	7.3; 1.7-32.1 p = 0.008	2.0; 1.3-2.9 p = 0.001	1.8; 1.2-2.8 p = 0.006	1.7; 1.2-2.5 p = 0.005	1.9; 1.3-2.8 p = 0.001
SHS-Pollutant	2.4; 1.2-4.9 p = 0.015	3.8; 1.7-8.2 p = 0.001	2.5; 1.1-5.9 p = 0.035	-	5.0; 1.6-15.1 p = 0.005	1.9; 1.3-2.8 p < 0.001	1.7; 1.1-2.6 p = 0.012	1.5; 1.0-2.1 p = 0.030	1.7; 1.2-2.4 p = 0.007
SHS Ventilation	-	2.1; 1.1-4.1 p = 0.026	-	1.6; 1.1-2.3 p = 0.016	-	-	1.8; 1.2-2.7 p = 0.007	1.6; 1.1-2.4 p = 0.011	1.9; 1.3-2.7 p = 0.001
G Training	2.7; 1.3-5.7 p = 0.010	2.1; 1.0-4.5 p = 0.051	-	-	3.3; 1.2-9.3 p = 0.026	-	-	-	-
UG Training	-	-	5.1; 1.2;22.1 p = 0.028	-	5.0; 1.1;22.1 p = 0.034	-	-	-	-
Female	2.4; 1.2-4.6 p = 0.010	-	-	-	2.9; 1.2-6.7 p = 0.015	-	-	-	-
Being a GP						1.7;1.1-2.4 p = 0.011			

Adm: administration; ass: associated; CI: confidence interval; G:graduate; I: indoors; O: outdoors; RM: role model; SHS- second-hand smoke; SF-smoke-free; UG: undergraduate; aOR: adjusted OR for age, gender, specialty, smoking behavior, SF car, SF home, SHS believes, RM attitudes to being non-smokers, undergraduate/graduate training.

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strong support for comprehensive SFPs in public settings. Reporting a smoke-free home was the most consistent predictor of strong agreement with SFPs, followed by reporting SHS beliefs, favourable RM attitudes and being a non-smoker. Smoking behaviour was one of the main predictors of SFP support within restaurants and bars/discos, healthcare outdoors (Table 5); and smoking restrictions in the home/car (not shown).

Discussion

This exploratory study suggests that few Portuguese physicians are engaged in tobacco control. While the overwhelming majority strongly agree that SHS endangers health, strong awareness of SFP public health benefits and the current TC law is limited; a significant minority believes that SHS can be eliminated by ventilation systems. Furthermore, most physicians lacked specific TC training and only a minority participated regularly in smoking prevention or cessation activities. General agreement with SFPs was high, but significantly lower for indoor leisure settings, outdoors bans and private smoking restrictions. Moreover, participants reported high smoking rates. Among smokers, smoking in the home or car was common. GPs were more involved in TC activities, including training, than hospitalists. Younger physicians reported UGT more often and being more aware of training needs than the older ones; they also reported participating more often in cessation activities. Among physicians, 2/3 recognize that they should receive training on TC, but less than 1/3 received undergraduate training and less than half reported graduate training. Training was the most consistent predictor of participation in TC activities, followed by being a GP. As underscored by other authors [16,17,25-31], these findings highlight the need for engaging medical and professional continuous education, as well as medical associations, with TC; and to disseminate TC training both in medical schools, and in primary care and hospital settings. Recently, Do and Bautista have surveyed TC attitudes among a world-wide large sample of medical students. They have observed that only 25% of students have received undergraduate training on TC [30]. On the other hand, two recent national surveys have observed that around half of the Portuguese GPs and a minority (4.9%) of hospitalists have received graduate training in TC; only a minority of physicians have received extensive GT or participate in cessation programmes [17,18]. Whereas physicians receive special training to provide effective and safe health care to populations, there is a need for specific training on smoking cessation to guarantee systematic and effective cessation counselling and support [21,25]. Similarly, specific TC training is crucial to engage physicians and other HCPs in advocacy and policy-making [10,11,28,30]. It is also worth noting that training influenced few items in SFP support and SHS/SFP beliefs, suggesting that those concerned received inadequate training on TC policy. This finding also has been reported by several authors, both nationally and internationally [16,17,28,30]. In fact, following the preparation of Portugal's TC law, HCPs' training and engagement in smoking cessation expanded to different healthcare settings. Nevertheless, training and awareness of TC policy and capacity building are seldom included in these programmes [32]. When comparing physicians' overall support in public settings, acceptance was significantly higher where the ban is long-standing and has fewer exemptions; and also for role-model professional workplaces, i.e. healthcare and school settings. These findings are consistent with past research that has concluded that support is stronger where bans have been implemented for a longer time and where there are fewer exemptions [33,34]; and that additionally, workplaces rules and beliefs influence support for SFP [35]. Furthermore, cross-country research has consistently shown that smoke-free bars and pubs are significantly less well accepted than smoke-free workplaces and restaurants [36]. This same trend was observed in this study; moreover, physicians reported slightly less support for smoke-free restaurants and bars than the general population [36]. Likewise, a recent wide cross-country survey has observed that European medical students were among those reporting less favourable attitudes regarding smoking bans in restaurants and bars [30]. It should be emphasized that since there is no safe level of SHS exposure, strong SFP support should apply for all settings. These findings clearly indicate that physicians are not particularly aware of public health science or more specifically of the fact that only comprehensive SFPs protect populations against SHS. Moreover, the great majority of physicians reported low compliance with the partial ban; suggesting that they should be more aware of the need for a comprehensive policy. Factors associated with stronger support for SFPs followed the same pattern as for general population. Being a non-smoker strongly predicted support for smoking restrictions in outdoors, leisure and private settings. These settings were, in turn, those with lower physicians' support. As reported by other studies [16,17,28,37,38], these findings clearly indicate that smoking among physicians is still a major barrier to social norm change. On the other hand, reporting a smoke-free home was the most consistent factor associated with strong SFP support. In fact, regulation of smoking in the home is a strong predictor of self-enforcement and compliance with SFPs and social norm change, even among smokers [39,40]. Furthermore, younger physicians did not consistently report stronger support for SFPs, which may suggest that they are not trained on TC policy and that the social norm did not change after the implementation of the partial ban. In sum, all these findings suggest that physicians' attitudes to SFP are not influenced by evidence-based

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public health science. This, in turn, is in line with previous studies [16,17,28]. Physicians' attitudes and behaviours do, however, clearly influence their clinical and public health practice [12,20,26,27]. In Portugal, the great majority of physicians are not active in leading public health policy and TC advocacy. The Portuguese Medical Association is not engaged in tobacco control; an official policy on tobacco use and advocacy is lacking [41,42]. Meanwhile, many HCPs and physicians continue to smoke [15,16,19,32]. When physicians are noticed smoking in public, this reinforces smoking visibility and social acceptance, undermining social norm change [16,19,29]. In addition, smoking physicians are less likely to provide cessation support or to actively advocate for tobacco control policies [30]. By contrast, when smoking physicians and HCPs are enrolled in a cessation programme, this promotes their advice on tobacco cessation [43]. Similarly, physicians' training in TC is associated to willingness to quit [19]. Thus to promote tobacco control, especially in countries where tobacco use is prevalent among HCPs, it is crucial to implement cessation programmes targeting medical/health sciences students, physicians and other healthcare workers, both in medical/health sciences schools and healthcare settings [16,19,28-31,44]. These programmes should be funded and evidence-based; they should be linked to comprehensive TC training focusing on tobacco health hazards, the role of physicians/HCPs in TC, policy and capacity building and not only tobacco cessation skills. An effective health promotion/TC national strategy should prioritise comprehensive, integrated and adequately-funded TC programmes led by TC experts and actively engaging medical/health sciences schools, medical associations and HCPs networks/societies, hospital managers and healthcare systems [10,16,19,28-31,44-47]. These programmes have a key role to play, and should contemplate the following:

- Promote and enforce SFPs, including smoke-free university/hospital campus;
- Disseminate TC training among HCPs, emphasising the key role of HCPs and physicians as non-smoking exemplars and TC advocates;
- Strengthen participation of and partnership with non-governmental organisations and civil society
- Raise public awareness regarding tobacco addiction, tobacco use and SHS health hazards, and the benefits of tobacco cessation
- Promote and adequately support smoking cessation [10,46].

Strengths and limitations

This study has both strengths and limitations. The main limitation includes the non-random selection of physicians who have attended two national conferences; and the low sample size when considering medical specialties sub-groups. This affects the representativeness and generalisability of the study findings. Thus sample selections bias should be stressed. Nevertheless, the target population is difficult to survey, especially in Portugal. On the other hand, it is particularly challenging to obtain a representative sample of physicians including the different specialties and healthcare settings. Nationwide physicians' databases were not available when the study was planned. Conference surveys with high response rates and low sample selection bias are described in the literature [20]. Attendees of national medical associations' conferences are usually representative of their members; these scientific events bring together physicians from all over the country with a wide range of age and professional development [20]. This justifies the study design.

However, whereas attendees of national medical associations' conferences are usually representative of their members, they are not representative of the whole population of Portuguese physicians. In particular, these two conferences targeted only GPs and hospitalists, mainly neurologists, internal medicine and rehabilitation medicine doctors. Theoretically, physicians attending medical conferences would be those more motivated to or involved in research and education. However in Portugal, medical conferences are highly sponsored by the pharmaceutical industry, which in turn tends to invite clinicians more engaged with pharmaceutical prescription. We may consider that these physicians are less involved with public health. Nevertheless, WHO clearly emphasises that all healthcare providers and specially physicians should be engaged with smoking cessation and TC [10]. On the other hand, because of the study's cross-sectional design, causality cannot be established. The study relies on self-reported responses, thus social desirability bias should be stressed. Given the response rate, non-response bias should be allowed. Furthermore, responders generally include those more interested in the subject. Thus, it should be assumed that physicians' tobacco use is underestimated, and that physicians' involvement in TC is probably even more limited. In spite of these limitations, this survey is one of the few that explored physicians' involvement in TC in Portugal and obtained good response rates. When compared with national and international surveys similar trends were observed. Finally, the good response rate suggests that a well-planned conference-based survey may be an innovative and good approach to survey physicians in countries where this is particularly difficult.

Conclusions

The findings suggest that Portuguese physicians are not aware of their role in tobacco control. Furthermore, physicians' smoking prevalence is high. This highlights the

need for engaging medical schools and medical professional organisations with tobacco control and physicians' smoking prevention. Poor engagement of physicians in tobacco control may contribute to the current lack of comprehensive policies in Portugal and Europe, and undermine social norm change. Medical associations/organisations should acknowledge their leadership role and assume a core responsibility in promoting smoke-free environments and tobacco control best practices. To achieve this, medical and continuing education on tobacco control should be made top priorities. Training should be adequately-funded, led by TC experts and include tobacco health hazards, emphasis on the role of physicians in TC, capacity building, benefits of tobacco cessation and cessation skills.

Abbreviations

CI: Confidence interval; FCTC: Framework Convention on Tobacco Control; GPs: General practioners; GT: Graduate training in smoking prevention/treatment; HCPs: Health care providers; OR: Odds ratio; aORs: Adjusted ORs; MLR: Multiple logistic regression; RM: Role model; SD: Standard deviation; SFP: Smoke-free policy; SHS: Second-hand smoke; SRGs: Students and recent graduates; TC: Tobacco control; UGT: Undergraduate training in smoking prevention/treatment; WHO: World Health Organisation.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

SBR conceived the study and gathered the information, completed data entry, data analysis and drafting of the manuscript. All authors participated in the design of the study, analysed and interpreted the data and critically reviewed the original draft. SBR and JMC coordinated the study design. PA coordinated the statistical analysis. All authors read and approved the final manuscript.

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Compliance and enforcement of a partial smoking ban in Lisbon taxis: an exploratory cross-sectional study

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Abstract

Background: Research evaluating enforcement and compliance with smoking partial bans is rather scarce, especially in countries with relative weak tobacco control policies, such as Portugal. There is also scarce evidence on specific high risk groups such as vehicle workers. In January 2008, Portugal implemented a partial ban, followed by poor enforcement. The purpose of this study was to explore the effectiveness of a partial smoking ban in a pro-smoking environment, specifically transportation by taxi in the city of Lisbon. Ban effectiveness was generally defined by ban awareness and support, compliance and enforcement.

Methods: Exploratory cross-sectional study; purposive sampling in selected Lisbon streets. Structured interviews were conducted by trained researchers while using taxi services (January 2009-December 2010). Participants: 250 taxi drivers (98.8% participation rate). Chi-square, McNemar, Man Whitney tests and multiple logistic regression were performed.

Results: Of the participants, 249 were male; median age was 53.0 years; 43.6% were current smokers. Most participants (82.8%) approved comprehensive bans; 84.8% reported that clients still asked to smoke in their taxis; 16.8% allowed clients to smoke. Prior to the ban this value was 76.9% ($p < 0.001$). The major reason for not allowing smoking was the legal ban and associated fines (71.2%). Of the smokers, 66.1% admitted smoking in their taxi. Stale smoke smells were detected in 37.6% of the cars. None of the taxi drivers did ever receive a fine for non-compliance. Heavy smoking, night-shift and allowing smoking prior the ban predicted non-compliance.

Conclusions: Despite the strong ban support observed, high smoking prevalence and poor enforcement contribute to low compliance. The findings also suggest low compliance among night-shift and vehicle workers. This study clearly demonstrates that a partial and poorly-enforced ban is vulnerable to breaches, and highlights the need for clear and strong policies.

Keywords: Tobacco control, Second-hand smoke, Smoking partial ban, Smoke-free policy, Compliance, Enforcement, Taxi, Smoke-free cars

Background

Worldwide, tobacco remains a leading preventable cause of death, killing nearly 6 million people each year, including more than 600,000 who had been exposed to second-hand smoke (SHS) [1]. Enacting 100% smoke-free policies (SFPs) is the only effective way to eliminate SHS and its consequences [2]. Examples from countries where comprehensive SFPs have been adopted, with few exemptions and no allowance for smoking areas in hospitality venues, teach us that good compliance and self-regulation can be achieved [1-6]. Good smoke-free policies become self-enforced over time, relying on self-regulation and changes in social norms. These changes occur when comprehensive SFPs are fully implemented, while media campaigns and ongoing community education efforts promote public awareness and support. In addition, planned implementation, strong and comprehensive enforcement

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and monitoring over time, especially during the first years after bans come into force, are critical to achieving public acceptance and compliance, self-regulation and social norm change [2-9]. This may be particularly needed in "Mediterranean tolerant" countries and in pro-smoking environments [10-12]. While smoking bans have raised awareness of SHS exposure in many public places, this may be not the case in particular enclosed settings such as motor vehicles. Smoking in cars and motor vehicles is particularly harmful, due to dangerously high concentration of pollutants in these confined enclosed spaces [13-16]. Furthermore, smoking in cars is also a risk factor for traffic accidents [17]. Studies evaluating the effectiveness of comprehensive SFPs are common, but research evaluating enforcement and compliance with partial bans is rather scarce, especially in countries with relative weak tobacco control policies, such as Portugal. There is also scarce evidence that specific high risk groups may comply less with the ban. Although many European countries have ratified the Framework Convention on Tobacco Control, tobacco control progress in Europe has been disappointingly slow [1,18]. There is, therefore, a need for background research evaluating the impact of partial bans. In January 2008, Portugal implemented a partial ban, full of ambiguities and exemptions, followed by poor enforcement [12,19,20]. Smoking areas are allowed in hospitality venues and shopping malls and many exemptions are accepted. Patchy compliance has been reported and smoke-free hospitality venues are fast changing into smoking areas due to:

- poor enforcement [19,21,22].
- low awareness of second-hand smoke hazards [12,23].
- the general impact of the ongoing economic crisis and fear among business owners of losing customers [21,22].

Nevertheless, few independent studies are currently evaluating compliance with the ban in Portugal. Past research predicted low compliance in high smoking prevalence and pro-smoking environments [10,12]. We hypothesized that a partial and poorly-enforced ban would have limited power to generate public awareness and self-regulation, resulting in poor compliance over time, especially in pro-smoking environments. Recent studies have identified breaches of the smoking ban in public transports and work vehicles, and high smoking prevalence among taxi drivers [24,25]. Few studies have assessed compliance and enforcement with smoking bans in taxis or other work vehicles, or factors associated with this behaviour. Under current Portuguese law, smoking is banned in workplaces and public transports. The purpose of this study was to explore the effectiveness of the Portuguese partial ban in a pro-smoking environment, specifically public transportation by taxi in the city of Lisbon. We hypothesized that both taxi users and taxi drivers might see taxis as less public than other public places and that enforcement would be both more difficult and less frequent. Effectiveness of the ban was generally defined by ban awareness and support; compliance and enforcement. We also aimed to identify factors associated with ban support and compliance.

Methods

Study design, site, study population and sampling

An exploratory cross-sectional study was carried out using interviewer-administered questionnaires and direct observation. Research methods had to take into account a limited budget and time constraints. During the study period there were 3.450 taxi licenses in Lisbon. Our study population was taxi drivers. Systematic direct observation evaluated the display of the required smoking ban signs in taxis and direct and indirect signs of tobacco consumption. Face-to-face structured interviews were conducted between January 2009 and December 2010 by trained researchers while using taxi services in Lisbon city. A previous study had highlighted the difficulty of obtaining a random sample of vehicles in a busy city [24]. Considering the study aims and this limitation, a purposive sampling was applied. We sought to include circulating taxis arriving from different places of Lisbon. We selected a subset of 20 streets in Lisbon centre, accordingly to the geographic area, using a map of the main streets of Lisbon centre (5 in each main directional axis of the city: North, South, East, and West). These were main and busy traffic streets that intersect the city axes. Circulating taxis travelling along these streets are not local traffic; instead they arrive from all parts of the city. Taxi drivers were only paid the taxi fare, independently of their acceptance to collaborate on the survey. The procedure for approaching the taxis on the streets was a systematic way, i.e. the interviewers systematically stopped the first taxi available that was circulating on the selected streets, until they reached their quota for that day, accordingly to the city area and time sampling frame. We excluded taxis waiting at taxis ranks. After stopping the taxi, interviewers indicated the driver their destination as "opportunistic natural clients". If the taxi driver would refuse to be interviewed, researchers would complete their taxi ride until they had reached their destination, as had been previously settled. For time sampling, we assumed that weather and other seasonal conditions, and also work-schedule shifts, might influence the study's outcomes. Field work was therefore conducted between 7 a.m. and 3 a.m. and during all seasons of the year. We calculated a sample frame by randomly selecting days of the week, weeks and work-

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schedule shifts. We aimed to conduct the study as naturally as possible to minimise bias, especially social desirability bias. We also wanted to maximise empathy and taxi driver collaboration. With these aims in mind, we used pen and paper to collect field data. Recruitment was halted when no new relevant information could be elicited [26]. The final sample included 250 taxi drivers (98.8% participation rate): 249 male, median age 53.0 years. Of those 3 taxi drivers that refused to participate, signs of tobacco consumption were observed in only one taxi. The questionnaire was based on 30 initial semi-structured interviews, using a list of specific questions and topics to be discussed. This preliminary field work was conducted by the main researchers who also analysed together and categorised the contents as pre-coded answers. To ensure feasibility and flexibility, and to add verbatim quotation, the final questionnaire comprised a combination of 18 closed-ended and 4 open-ended questions. Spontaneous comments were systematically recorded by the researchers and analysed as verbatim quotations. Field testing was performed with a small sample of 10 taxis. On average, the interviews lasted 15 to 20 minutes. All participants gave their verbal consent to collaborate, after the researchers had explained the study aims, the institutions involved, and warranted anonymity. The study protocol was approved by the University of Beira Interior Research Ethics Committee.

Questionnaire, measures and outcomes

The questionnaire contained standard items on socio-demographics and work-shift schedule, and taxi sharing with colleagues. Questions on smoking behaviour included smoking status and smoking behaviour inside the taxi (colleague included), tobacco consumption (cigarettes per day), willingness to quit and cessation support. The questions "have you ever smoked?", "do you currently smoke?", and "when did you quit?" were used to access smoking status. Participants were classified as never-smokers, smokers, and ex-smokers (having quit more than 1 year ago). Participants were also asked if they had ever attended a session addressing the ban (including SHS health hazards, and those associated with smoking in vehicles) or cessation support. Additionally, the questionnaire addressed SFP awareness and support; ban compliance and enforcement.

SFP awareness and support

SFP awareness was accessed by observing the display of required smoking ban signs and by two open-ended questions to address the understanding of SFPs or SHS beliefs:

- Do you know the main reasons for smoking restrictions in indoor public spaces, including public transportation?
- Do you allow clients to smoke in your taxi? If not, what are the major reasons? These two questions were asked twice to access behaviour before and after the smoking ban came into force.

We also asked about smoking restrictions in the driver's home and car.

SFP support was evaluated by asking:

- Do you agree with total smoking bans in any indoor public spaces (public buildings, workplaces, restaurants, cafes, shops, etc., and public transport including taxis)?

This item was accessed using a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). For data analysis, ban support was calculated aggregating "agree" and "strongly agree", and strong ban agreement included only "strongly agree".

Ban compliance and enforcement

Ban compliance was evaluated by self-reported compliance and direct and indirect signs of tobacco consumption such as observing smoking in the taxi and detection of smoke smell, cigarette butts or ash. Self-reported compliance was analysed in two ways:

- Compliance: drivers report that they do not smoke in the taxi.
- Self-enforcement: drivers report that they do not allow clients smoke in the taxi.

We also inquired about clients' compliance, i.e. if clients ask to smoke in the taxi.

Questions: Do clients ask you to smoke in the taxi? If they ask you what is your answer? Do you smoke in the taxi?

Enforcement was evaluated by self-reported fine application or overhaul.

Data analyses

Data was analysed using the SPSS statistical package (version 17). Descriptive analysis was performed by calculating the absolute and relative frequencies and the crude odds ratio (OR). Bivariable analyses were conducted using chi-square tests to compare categorical variables, and t tests, or Mann–Whitney tests, to compare means or medians. McNemar tests were used to compare matched samples. A two-sided p value of 0.05 was considered statistically significant. Multiple logistic regression analysis (MLR) was performed to identify factors associated with ban support, self-enforcement and compliance. Self-enforcement and compliance were coded as 1 (yes) and 0 (no). Strong ban agreement was

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the dependent variable in MLR ban support: stronger agreement (1), versus less or no agreement (0). MLR independent variables included those already identified in the literature [3,10,12,13,27] or significantly associated with the dependent variables in the bivariable analysis, such as: age-group, smoking status, tobacco consumption, shift work, ban support, SHS beliefs (reporting health protection as the main reason for the ban), private smoking restrictions (home and car) and participants' norms prior the ban (allowing clients smoking in the taxi prior the ban). A backward elimination of explanatory variables at a 5% level of significance was performed. Results are presented as ORs and 95% confidence intervals (CI). During the interviews, spontaneous comments and open-ended data were written out in full in the respondents' own words. This material was then read through and analysed together by the main researchers at the office. Quotation contents analysis relied on the agreement of the main researchers [26].

Results

Participants, smoking behaviour and cessation support

Table 1 describes general characteristics of the sample and smoking behavior by age and gender. Overall smoking prevalence was 43.6% (95% CI-34.4–46.6). When questioned about other colleague's smoking behaviour, 43.8% of those who shared a taxi with a colleague answered that their colleague was a smoker and 7.3% did not know. Smoking behaviour was significantly associated with shift-work (smokers: dayshift-30.4%; nightshift- 67.6%; both-41.8%; $p < 0.001$). Current smokers reported smoking on average 25.5 ± 3.0 cigarettes per day (median = 20); and ex-smokers 37.5 ± 5.2

Table 1 General characteristics of the sample and smoking behavior by age and gender *

Gender	n	%						
Male	249	99.6						
Female	1	0.4						
Nationality								
Portuguese	246	98.4						
Non-Portuguese	4	1.6						
Work-shift								
Day	115	46.0						
Night	68	27.2						
Both	67	26.8						
Education**								
4–6	135	54.0						
7–9	65	26.0						
10–11	26	10.4						
12	23	9.2						
Higher Education	1	0.4						
Taxi sharing with colleague								
Yes	178	71.2						
No	72	28.8						
Total	250	100						
Age-Group	**Smokers**		**Ex-smokers**		**Never-smokers**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
25–44	30	60.0	9	18.0	11	22.0	50	100
45–54	42	51.2	23	28.0	17	20.7	82	100
55–64	30	35.3	36	42.4	19	22.4	85	100
65–76	7	21.9	14	43.8	11	34.4	32	100
Total	109	43.8	82	32.9	58	23.3	249	100
Females								
45–54	0	0.0	0	0.0	1	100.0	1	100
Total	**109**	**43.6**	**82**	**32.8**	**59**	**23.6**	**250**	**100**

* $p = 0.005$. ** Education in schooling years. In Portugal, since 1986, compulsory education is 9 years. Before 1986 it was 4–6 years.

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(median = 35), $p < 0.001$. Of the smokers, 52.3% reported they did not want to quit. All ex-smokers, except one, had quit "cold turkey", usually after a tobacco-related illness or life threatening event. Two participants reported having used over the counter NRT. None of the participants had ever attended a smoking prevention session addressing the ban, SHS health hazards, or cessation support.

SFP awareness and support

All taxis displayed the required signs, concerning the legal ban. Table 2 shows ban support and factors associated with this behaviour. Most participants (82.8%) approved smoking bans in indoor public places. In addition, of those who lived in their own house or owned a car, 55.6% reported a smoke-free (SF) home, and 53.6% a smoke-free car. Support for the ban was significantly associated with smoking status and private smoking restrictions. Day-shift participants reported stronger ban support. In addition, those who indicated health protection as the main reason for the ban reported the strongest ban agreement. Heavy smokers reported less positive attitudes, compared to lighter smokers. Education did not influence ban support (data not shown). MLR showed that being a non-smoker predicted strong ban support, followed by reporting health believes and by reporting a smoke-free car. Table 3 presents self-reported main reasons for the understanding of the ban.

Ban compliance and enforcement

Tables 4 and 5 present self-enforcement and compliance respectively, and factors associated with this behaviour.

Table 2 Ban support and associated factors

Ban support		Strongly agree/ agree		Strongly disagree/ disagree		Total		Crude OR	95%CI	p value	Adjusted OR	95%CI	p value	MLR (Strong ban support)
		n	%	n	%	n	%							
Smoking behaviour	N-Smokers	133	94.3	8	5.7	141	100	7.86	3.47–17.84	<0.001	6.27	3.05–12.86	<0.001	**Model explanation**
Ref	Smokers	74	67.9	35	32.1	109	100							77.8%
	Total	207	82.8	43	17.2	250	100							
Smoke-free Home *	Yes	117	90.7	12	9.3	129	100	3.82	1.84–7.95	<0.001	*ns*			**Hosmer and Lemeshow test**
Ref	No	74	71.8	29	28.2	103	100							p = 0.296
	Total	191	82.3	41	17.7	232	100							
Smoke-free Car **	Yes	115	95.8	5	4.2	120	100	11.17	4.17–29.91	<0.001	2.39	1.16–4.90	0.018	**Model p value**
Ref	No	70	67.3	34	32.7	104	100							<0.001
	Total	185	82.6	39	17.4	224	100							
Cigarettes per day	≤20	19	45.2	23	54.8	42	100	2.63	1.15–6.02	0.20	*ns*			
Ref	>20	16	23.9	51	76.1	67	100							
	Total	35	32.1	74	67.9	109	100							
Strong ban support		Yes		No				Crude OR	95%CI	p value	Adjusted OR	95%CI	p value	
		n	%*	n	%	n	%							
Shift work	Day	72	62.6	43	37.4	115	100	3.50	1.86–6.59	<0.001	*ns*			
Ref	Night	22	32.4	46	67.6	68	100							
	Total	94	51.4	89	48.6	183	100							
Health beliefs	Yes	78	73.6	28	26.4	106	100	4.38	2.53–7.56	<0.001	3.71	1.85–7.43	<0.001	
Ref	No	56	38.9	88	61.1	144	100							
	Total	134	53.6	116	46.4	250	100							

OR Odds ratio, *MLR* Multiple logistic regression, *Ref* Reference category for comparison; ns: non-significant; * not-applicable: "I live in a rented room" (n = 18); ** not-applicable "I do not have a private car" (n = 26). Adjusted OR derived from MLR model adjusted for driver's smoking behaviour, Smoke-free car, Smoke-free home, tobacco consumption, shift work, health believes.

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Table 3 Self-reported main reasons for the understanding of the ban

Understanding of the ban	n	%
• Health/To avoid Diseases	98	39.2
• Respect non-smokers	92	36.8
• To reduce consumption	6	2.4
• Health + Respect non-smokers	8	3.2
• Do not know	31	12.4
• Environmental and pollution control	5	2.0
• Others*	10	4.0
Total	250	100.0

*Other reasons: EU imposition, political reasons, "fashion", "fundamentalism".

Of the smokers, 66.1% admitted smoking in their taxi. When questioned about other colleague's smoking behaviour, 71.0% of those drivers that shared a taxi with a smoking colleague reported that colleagues that smoked did so inside their taxis (24.4% did not know). 84.8% of the drivers reported that clients still asked to smoke in their taxis (9.6% often; 30.4% sometimes; 44.8% seldom; 15.2% never); 16.8% allowed clients to smoke in their vehicles. Prior to the ban this value was 76.9% ($p < 0.001$). The major reason for not allowing smoking was the legal ban and associated fines (71.2%). See Table 6. Allowing smoking in private settings was significantly more frequent than inside taxis ($p < 0.001$). Stale smoke smells were detected in 37.6% of the cars and were significantly associated with the driver being a smoker ($p < 0.001$), or having a colleague who smoked ($p < 0.001$), and reporting smoking in the taxi ($p < 0.001$). Prior to stopping the taxi for the service, researchers observed 5 participants smoking inside the taxi. Another participant smoked during the taxi service. This was the only vehicle in which ashes were observed. In total, we observed 6 (2.4%) participants smoking in the taxi. None of the taxi drivers did ever receive a fine for non-compliance or was stopped by the police. Self-enforcement was reported more often than compliance ($p < 0.001$), even among smokers ($p = 0.001$). Ban support was significantly associated with self-enforcement, but not with compliance. Smokers more frequently allowed clients

Table 4 Self-enforcement and associated factors

Self-enforcement		Yes		No		Total		Crude OR	95%CI	p value	Adjusted OR	95%CI	p value	MLR
		n	%	n	%	n	%							
Smoking behaviour	N-Smokers	131	92.9	10	7.1	141	100	5.44	2.54–11.69	<0.001	3.94	1.77–8.75	0.001	**Model explanation**
Ref	Smokers	77	70.6	32	29.4	109	100							82.9%
	Total	208	83.2.	42	16.8	250	100							
Smoking Drivers' Compliance	Yes	35	94.6	2	5.4	37	100	12.50	2.79–56.02	<0.001	ns			**Hosmer &Lemeshow test**
Ref	No	42	58.3	30	41.7	72	100							P value = 0.264
	Total	77	70.6	32	29.4	109	100							
Smoke-free Car *	Yes	111	92.5.	9	7.5	120	100	4.54	2.03–10.17	<0.001	ns			**Model p value**
Ref	No	76	73.1	28	26.9	104	100							<0.001
	Total	187	83.5	37	16.5	224	100							
Allowing smoking prior to the ban**	No	48	96.0	2	4.00	50	100	6.41	1.49–27.69	0.005	4.79	1.08–21.16	0.039	
Ref	Yes	131	78.9	35	21.1	166	100							
	Total	179	82.9	37	17.1	216	100							
Age	≥55	104	88.9	13	11.1	117	100	2.23	1.10–4.53	0.024	ns			
Ref	<55	104	78.2	29	21.8	133	100							
	Total	208	83.2	42	16.8	250	100							
Ban support	Yes	179	86.5	28	13.5	207	100	3.09	1.46–6.55	0.002	ns			
Ref	No	29	67.4	14	32.6	43	100							
	Total	208	83.2	42	16.8	250	100							

OR Odds ratio, *MLR* Multiple logistic regression, *Ref* Reference category for comparison; ns: non-significant; *not-applicable: "I do not have a car" (n = 26); **not-applicable: "I did not work as a taxi driver prior the ban" (n = 34); Adjusted OR derives from MLR adjusted for drivers' smoking behaviour, allowing smoking prior to the ban, smoke-free car, age, ban support.

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Table 5 Compliance and associated factors

Compliance		Yes		No		Total		Crude OR	95%CI	p	Adjusted OR	95% CI	p	MLR
		n	%	n	%	n	%							
Cigarettes per day	>20	3	7.1	39	92.9	42	100	0.08	0.02–0.27	<0.001	0.045	0.01–0.38	0.004	**Model explanation**
Ref	≤20	34	50.7	33	49.3	67	100							77.6%
	Total	37	33.9	72	66.1	109	100							
Allowing smoking* prior to the ban	Yes	21	25.9	60	74.1	81	100	0.18	0.05–0.64	0.004	0.15	0.02–0.88	0.036	**Hosmer and Lemeshow test**
Ref	No	8	66.7	4	33.3	12	100							p = 0.950
	Total	29	31.2	64	68.8	93	100							
Smoke-free car**	Yes	13	56.5	10	43.5	23	100	4.12	1.55–10.97	0.003	ns			**Model p value**
Ref	No	18	24.0	57	76.0	75	100							<0.001
	Total	31	31.6	67	68.4	98	100							
Shift work	Night	11	23.9	35	76.1	46	100	0.30	0.12–0.77	0.011	0.20	0.05–0.79	0.021	
Ref	Day	18	51.4	17	48.6	35	100							
	Total	29	36.3	52	63.8	81	100							
Health beliefs	Yes	16	48.5	17	51.5	33	100	2.47	1.06–5.76	0.035	ns			
Ref	No	21	27.6	55	72.4	76	100							
	Total	37	33.9	72	66.1	109	100							

OR Odds ratio, *MLR* Multiple logistic regression, *Ref* Reference category for comparison; ns: non-significant; **not-applicable: "I did not work as a taxi driver prior the ban" (n = 16); *not-applicable: "I do not have a car" (n = 11); adjusted OR derived from MLR adjusted for driver's tobacco consumption, allowing smoking prior to the ban, Smoke-free car, shift work, health believes.

to smoke in their taxi (29.4%) than ex-smokers (4.9%) or never smokers (10.2%), ($p < 0.001$). The same trend was reported by younger taxi drivers. Participants that reported not allowing smoking prior the ban also reported consistent self-enforcement. Moreover, having a SF car was associated with consistent self-enforcement and compliance. Finally, drivers who reported smoking in the taxi allowed clients to smoke more often. Education did not influence self-enforcement, or compliance (data not shown). MLR showed that being a non-smoker and reporting not allowing smoking prior the ban predicted self-enforcement. Heavy smokers reported smoking in the car more often than lighter smokers. Night-shift participants also reported the same behaviour. Compliance was also significantly associated with reporting a smoke-free car, not allowing smoking prior the ban and reporting health protection as the main reason for the ban. MRL showed that being a heavy smoker, working at night, and allowing smoking prior the ban predicted non-compliance.

Table 6 Reasons for not allowing clients smoking in the taxi

Before the ban	**n**	**%**
SHS annoyance	19	36.0
To avoid diseases/own health	11	26.0
SHS annoys clients & damages the car	19	36.0
It is forbidden	1	2.0
Total	**50**	**100.0**
After the ban	**n**	**%**
SHS annoyance & legal ban	29	13.9
To avoid diseases/own health & legal ban	16	7.7
SHS annoys clients, damages the car & legal ban	15	7.2
The legal ban and associated fines	148	71.2
Total	**208**	**100.0**

Quotation contents analysis

Relevant recurrent themes included: "It's very difficult to quit... and ... to abstain from smoking in the taxi...due to work-related stress". "We're aware that many colleagues are heavy smokers...and that they frequently smoke in their taxis... when they're alone... but they're not fined, so they continue to smoke". "The ban cannot be effective because of poor enforcement and lack of sanctions", "the authorities

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are at fault cause they don't apply the fines. . .", "it was difficult to forbid smoking before the ban. . . we couldn't risk losing clients.... SFPs are a good thing indeed". "Usually I don't allow smoking in the taxi, but in special occasions, I do: on longer trips. . .at night. . . when enforcement is less probable . . ."when clients are very nervous or disturbed. . . we shouldn't displease our clients". "Tobacco smoke annoys clients . . . and ruins the upholstery of the car" "Clients ask more often to smoke at night. . . when they've drunk alcohol, or young people ask to smoke quite often". We also observed that a smoke-free home depends specially on the family environment (others smokers, pressure from spouses, children or asthmatic relatives).

Discussion

All taxi drivers were aware of the smoking ban. Most of them reported ban support, understood this public health policy, and did not allow clients to smoke. In addition, a considerable proportion of participants reported smoking restrictions in their own private settings, although less often than mandatory legal restrictions. Nevertheless, while most taxi drivers approve the ban, the majority of smokers do not comply with it. In addition, most participants reported that clients still asked to smoke inside the taxi, and a significant minority allowed clients to smoke. Stale smoke smells were detected in a significant number of vehicles. Moreover, enforcement by the authorities was never reported. Our study shows that the majority of taxi drivers support comprehensive SFPs, highlighting that these policies are indeed highly popular, even among smokers, and in pro-smoking environments [3-5,9,10,12]. However, a significant proportion of participants admitted smoking in the car, as in other studies [12,13,28,29]. Furthermore, compliance was strongly predicted by smoking behaviour and not by attitudes to SFPs, as previous research has shown in other enclosed settings [10,12]. While the main reason for not allowing clients smoke in the taxi was the legal ban and associated fines, compliance was influenced by smoking behaviour, work-shift and participants' norms prior the ban. Recent observational studies have estimated prevalence of tobacco consumption and SHS exposure in vehicles. Prevalence was significantly lower than our study, and also lower in taxis than other commercial vehicles or private cars. However, observational studies usually report less SHS exposure than questionnaire-based surveys [24,30-32]. Moreover, our findings show that usually taxi drivers smoke in the taxi when they are alone. In year 2006, 57% of the Portuguese smokers declared smoking in the car [28]. A recent population-based study in Portugal observed that 64% of daily smokers reported smoking in their private cars [29]. In our study, taxi drivers reported smoking in the car about the same frequency. Vehicles that correspond to workplaces or public transports are required to be smoke-free under the Portuguese law. It is also worth noting that participants reported that young people often ask to smoke in the taxis. All these findings suggest that social smoking norms suffered little change after the ban. In addition, we may conclude that the ban is not effective in this particular setting. Quotation contents analysis suggests that pressure from clients also influences compliance. This may contribute to further breaches associated with partial bans and economic recession. Self-reported reasons for not allowing smoking included SHS annoyance, health beliefs, and work-related beliefs and rules. Ban support was influenced by SHS health beliefs, and was significantly associated with self-enforcement. Self-enforcement dramatically improved after the ban came into force, and was more frequently reported than compliance, even among smokers. All these findings are consistent with other studies and point out the importance of public health media campaigns, to promote public awareness and acceptance, educating about SHS health hazards and empowering citizens to enforce the law [3-5,9,12,27,33,34]. Health hazards concerning SHS exposure in vehicles should be emphasised. In addition, our study highlights the need to promote smoke-free cars and enforce bans in taxis and other commercial vehicles, in line with recent research [13,24,30-32]. This communication strategy should take into account normative beliefs and workplace rules and beliefs [33,34], as enforcement in vehicles may be difficult and less feasible [35]. Regarding education, our sample was rather homogeneous, revealing very low education levels. This may explain why education did influence neither ban support, nor compliance. Moreover, Hitchman et al have also observed that smoking in cars was not related to education [13]. There is evidence from the literature that ban support increases over time, after the implementation of a smoking ban. In addition, compliance may worsen over time when a partial and poorly enforced ban is implemented [2,7,19,36]. Thus we expected to observe some change over time, concerning support and compliance with the ban. Nevertheless, we did not observed any effect over the study time period. This may be explained as our study has begun one year after the ban came into force. Generally, the major changes occur in the first year of the implementation [2]. In addition, we may admit that this effect happened more often in other settings such us hospitality venues, and especially after the recession period [19,22]. When questioned about their understanding of the ban, one of the main reasons was: "respect for non-smokers". This finding is rather peculiar and may be influenced by no-smoking signs. In Portugal, no-smoking signs required by law do not include "no smoking" or "smoking is against the law", instead they indicate "smokers" (blue signs) or

"non-smokers" (red signs) [37]. This undermines the message of law breaching, while splits smokers and non-smokers, and may cause conflicts and arguments for "smokers' rights". Smoking prevalence was high. Most of the smokers reported being heavy smokers and did not want to quit, which indicates high tobacco dependence [38]. Nevertheless, participants did not report any cessation support by occupational health services. Our findings suggest that there is a need for comprehensive tobacco control policies targeting workplaces and specifically high risk groups, such as heavy smokers, low socio-economic status, and night-shift and vehicles workers. Partials bans do not target high risk groups in vulnerable settings. Workplace-based tobacco control programmes should become a priority and might contribute to ban support and compliance, including self-enforcement. Occupational health and human resources services should play a major role regarding SFP awareness and cessation. In general population, non-smokers are the majority. Promotion of citizens' enforcement, and non-smokers' assertiveness, through social environments and networks, should be encouraged [27,34]. Our findings show that a partial and poorly-enforced ban is vulnerable to breaches. The Portuguese smoking ban implementation was followed by popular media debates using "pro & cons" discussion style, instead of SFP evidence-based arguments. Public health education campaigns were absent. Since its implementation, exemptions and breaches, and ineffective enforcement were announced in the media. Important public figures, who should be role models, including the chief of the law enforcement body, and the Prime Minister, were involved in smoking ban public breaches and were not fined. The hospitality industry claimed for exemptions. An eminent law professor did argue against these exemptions, emphasizing that they could not protect all citizens, violating the general principle of health protection of Portuguese law. Following a polemic "media war", health authorities finally accepted these exemptions [19,39-41]. All these events definitely menaced the credibility of the smoking ban. SFP legislation is necessary to allow enforcement and to promote social acceptance. However, as highlighted by Spinney, 2007, p. 1507 [36], SFPs "will fail if they do not send out a clear message from the start". In addition, SFPs may turn backwards over time, if they are not enforced and publicized [2,36]. A partial ban does not protect all citizens from SHS exposure and may widen social and health inequalities. In addition, partial bans may also undermine social norm change [8,12,42]. Moreover, without timely-sustained education campaigns, promoting SFP awareness, and citizens' law enforcement, laws may not warrant compliance. A partial ban is, therefore, less cost-effective and more difficult to comply with than a comprehensive ban, and may raise enforcement costs [2,9]. These should be key messages for policy makers.

Strengths and limitations

Few studies have addressed enforcement and compliance with partials smoking bans, especially in taxis or other commercial vehicles. The study information was collected from a relative large number of interviews, and participation rate was high. Researchers were trained to minimize interviewer bias and approached the participants in their natural environment, as clients. Empathic relationship between interviewers and participants was easily achieved. However interviewer, observer, and social desirability biases cannot be excluded. The cross-sectional nature of the study does not allow causal inferences. Purposive sampling limits generalization to different populations. Sampling selection bias should also be considered.

Conclusions

Despite the strong ban support observed, high smoking prevalence and poor enforcement contribute to low compliance. The findings also suggest low compliance among night-shift and vehicle workers. This study clearly demonstrates that a partial and poorly-enforced ban is vulnerable to breaches, and highlights the need for clear and strong policies.

Abbreviations

CI: Confidence intervals; MLR: Multiple logistic regression model; NRT: Nicotine replacement therapy; NS: Non significant; OR: Odds ratio; REF: Reference; SF: Smoke-free; SFPs: Smoke-free policies; SHS: Second-hand smoke.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

SBR conceived the study and the study design, coordinated and participated in the field work, performed the statistical analysis, analysed and interpreted the data, and wrote the manuscript. JMC participated in the study design and in the field work, analysed and interpreted the data and contributed to the drafting of the manuscript. PA coordinated the statistical analysis, analysed and interpreted the data and critically reviewed the paper. MCB analysed and interpreted the data and critically reviewed the paper. All authors contributed, read and approved the final manuscript.

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Chapter 4

General discussion and conclusions

General discussion and conclusions

This thesis aimed to explore Portuguese healthcare professionals' (HCPs') and, in particular, physicians' awareness of and engagement in tobacco control (TC) and its association with social norm change regarding smoking by describing their smoking behavior trends, attitudes and beliefs regarding SHS and smoke-free policies (SFPs), and participation in TC activities. In addition, factors associated with attitudes to and engagement with TC were investigated. Tobacco use and TC training were systematically explored as the main independent variables, since tobacco use and lack of training are among the major barriers to overcome regarding HCPs' engagement in TC.

As previously mentioned at the research papers section, it was investigated whether Portuguese physicians behave as role-models either by being non-smokers themselves and smoking less than the general population or by reporting greater motivation to quit, or quitting at an earlier age than the general population. Additionally, it was studied whether Portuguese physicians act as TC leaders, either by reporting more positive attitudes and stronger support to SFPs than the general population or other HCPs, or by actively participating in TC activities. Finally, it was assessed the association between HCPs'/physicians' engagement in TC and social norm change regarding SHS. Two settings were chosen to target HCPs and physicians: a teaching hospital in Covilhã and a two conference-based survey targeting general practitioners (GPs), hospital-based physicians, medical students and recent graduates. In addition, a post-ban population-based survey targeting a specific group in a pro-smoking environment explored social norm change.

The following sections present a summary of the main results and conclusions of the peer review published papers.

4.1 Smoking behavior trends; tobacco control attitudes and support for smoke-free policies

Hospital staff survey

Smoking behavior trends

Smoking prevalence was rather high among hospital staff, especially among lower socio-economic groups, i.e. auxiliaries. Moreover, we should admit higher smoking rates due to the response rate (52.9%), and especially because few high dependent smokers returned the questionnaire (% of high nicotine dependent smokers: 2%). It should be noted that a recent household national representative survey reported that 9.4% of the smokers were high

dependent smokers,[33] according to Fagerstrom test.[74] Smoking behavior was strongly associated with occupation: auxiliaries reported the higher rates, followed by the non-HCPs (excluding office staff) and nurses. Physicians, other HCPs (nurses excluded), and office staff reported the lower prevalence. This occupational pattern should be interpreted with caution, since it might result from confounding regarding socio-economic status (SES), particularly education and income. These variables were not assessed individually, i.e. as independent survey tools. Nevertheless, educational level and income by professional group were checked by the human resources department: physicians correspond to the professional group with higher education and higher salary, followed by nurses, other HCPs and office staff, in contrast to auxiliaries. This professional group is the one with lower salary and lower education level (of the auxiliaries, 60% have ≤7 schooling years; 40%≤ 4 schooling years). It should be emphasised that physicians' survey participation was rather poor. Since participants are generally those more interested on the subject, it should be considered that physicians' smoking prevalence is underestimated. Being a smoker was more likely among those younger than 55 years, males and auxiliaries. Age was the major determinant of smoking behavior, followed by gender, and education and income (these two variables were indirectly assessed by occupation), in much the same way as occurs in the general Portuguese population. Although most smokers wanted to quit, and assumed that they should be role-models as non-smokers, only few reported readiness to quit and considered they would need assisted quitting. Smoking in hospital premises, as well as in private settings, was common practice.

Tobacco control attitudes and support for smoke-free policies

Most staff reported passive behavior regarding SHS exposure assertiveness; i.e. they admitted not complaining about SHS exposure, despite that most perceived high exposure in hospital premises. The high smoking prevalence and the passive behaviour regarding exposure to SHS may seriously undermine compliance with the ban, as well as smoking cessation among HCPs and patients. Agreement with hospital smoke-free policy was high, but significantly lower regarding bans in other indoor public spaces. Furthermore, physicians' TC behavior and attitudes to a smoke-free hospital and to the national smoking ban did not correlate with their status as "role-models". Smoking behavior was the main determinant of TC attitudes, not being role-models HCPs, i.e. physicians or nurses. While physicians were those reporting lower smoking rates, this study could not be conclusive regarding the hypothesis "physicians act as role-models as non-smokers exemplars", since physicians' participation was rather poor. Additionally, in order to eliminate socio-demographics confounding, i. e. the effect of age, education and gender, physicians should be compared with a general population sample with higher education matched by gender and age. The hospital survey was therefore a preliminary exploratory study that identified trends and hypothesis to be investigated in further studies, as well as the need for the second and third studies, respectively: a survey of a national sample of Portuguese physicians; and a population-based survey targeting a pro-smoking environment to explore the social norm regarding SHS. Additionally, the initial hospital survey raised the

need for obtaining a good response rate from physicians which provided the rational for the conference-based strategy adopted.

Physicians' survey

Smoking behavior trends

The great majority of younger physicians reported being never smokers, independently of gender, in contrast to their elders. Although these findings suggest that smoking prevalence among physicians is decreasing, smoking rates remain high. Moreover, we should admit higher smoking rates due to the response rate (64.0%), and especially because high dependent smokers did not return the questionnaire (% of high dependent smokers: 0%). Half of the ever-smoking physicians, irrespectively of their age group, declared establishing regular smoking during medical school. Current smoking was not influenced by speciality, i.e. GPs reported similar smoking rates than hospital-based physicians. Younger physicians reported more occasional smoking than the general population, independently of gender, suggesting an emergent consumption pattern. However, occasional smoking was associated with lower motivation to quit. Moreover, few physicians reported willingness to quit and only a minority considered needing cessation support. In addition, most physicians, including students, reported lack of cessation support in their workplaces. When compared with the general population by gender and age, similar smoking rates were reported among male physicians, despite lower quitting rates and later quitting; female physicians reported lower smoking rates and similar quitting rates and age-quitting trends. Although female physicians smoked less than the general population, they were not more motivated to quit.

In sum, physicians' smoking behaviour does not significantly differ from that of the general population.

We can conclude that Portuguese physicians do not behave as role-models either by being non-smokers and smoking less, or by reporting greater motivation to quit, or by quitting at an earlier age than the general population.

Tobacco control attitudes and support for smoke-free policies

While the overwhelming majority of physicians strongly agreed that SHS is harmful, awareness of SFP benefits and the TC law was restricted. A significant minority believed that ventilation systems can eliminate SHS. Support for SFPs was high in healthcare premises, public administration buildings, schools and workplaces, but significantly lower for indoor leisure settings, outdoors bans in healthcare/schools settings and smoking restrictions in the home/car. Factors associated with strong support for smoke-free policies followed the same trends as the general population. Smoking behaviour strongly predicted support for smoke-free regulations in indoor leisure and private settings, and healthcare outdoors. TC training influenced few items regarding SFP support and SHS/SFP beliefs, suggesting that participants'

training on TC policy was poor or inadequate. In sum, these findings do not correlate with expected status as "role models" or TC leaders.

4.2 Participation in tobacco control activities: self-reported cessation and tobacco control practices, training attendance and training awareness

Hospital staff survey

Delivery and recording of smoking cessation advice in a hospital setting - cessation practices: Ask and Advise (2As)

Although the great majority of hospital-based HCPs have reported positive attitudes to cessation, most of the hospital framework was not involved in cessation brief intervention, lacked specific training and were not aware of training needs. Most physicians and nurses, who were those more involved in cessation, however, failed to report either systematic brief intervention or record keeping. Therefore, hospital-based HCPs are not aware or do not follow smoking cessation guidelines. No statistically significant association was observed between graduate training and cessation practices. This may be partially explained due to the low reporting in training attendance, or low quality of training. Undergraduate training was the most important predictor of positive attitudes to cessation counselling and self-confidence to intervene, which were in turn strongly associated with cessation practices. Smokers reported intervening significantly less than non-smokers.
We may conclude that there is a need to engage and train hospital-based HCPs with cessation, and implement a system-level smoking cessation intervention.

In 2012, a cross-sectional study based on the observation of clinical records (physicians' and nurses' clinical notes) and also on inpatients direct interviews investigated the frequency of tobacco use recording and smoking cessation counselling. Tobacco use recording and inpatient cessation intervention was rather scarce and inconsistent, corroborating the findings of the former hospital survey.[75,76]

Physicians' survey

Physicians' participation in tobacco control activities

Most physicians lacked specific training and only a minority participated regularly in smoking prevention or cessation activities. GPs were more engaged in TC activities, including training, than hospital-based physicians. Younger physicians attended undergraduate training more often and were more aware of training needs than the older ones; they also participate twice more

often in cessation activities than hospital-based older physicians. Among physicians, the great majority recognize that they should receive training on TC, but less than 1/3 has received undergraduate training and less than half has attended graduate training. Training was the most consistent predictor of participation in TC activities, followed by being a GP. Nevertheless, training influenced few items in SFP support and SHS/SFP beliefs, suggesting that participants received inadequate training on TC policy.

In summary, the study findings point out that Portuguese physicians' participation in tobacco control is rather poor.

We may, therefore, conclude that Portuguese HCPs/physicians do not act as TC leaders, neither by reporting more positive attitudes and strongly supporting SFPs, nor by actively participating in TC activities. However, GPs are more engaged with TC than hospital-based physicians; younger physicians are more engaged with cessation and are more aware of training than their older colleagues; TC training is associated with engagement in smoking prevention and cessation but not with attitudes to and support for smoke-free policy.

4.3 Social norm change

Lastly, the hypothesis investigated in this thesis is that HCPs/physicians' engagement in TC would be associated with social norm change regarding SHS. The research findings show poor engagement of Portuguese physicians in TC. Likewise, poor TC awareness by HCPs/physicians would be associated with limited change on social norms. Social norm change is indirectly assessed by the following:

1. *Younger HCPs/physicians report the most positive TC attitudes and are significantly more engaged in TC.*

This was not observed in this study. Age was not a main predictor of TC attitudes. Particularly, younger HCPs/physicians failed to report stronger support for comprehensive SFP. However, they were more aware of training needs and reported undergraduate training more often. This may represent a promising change trend in medical education.

2. *HCPs and physicians report consistent high support for SFPs in all settings.*

Again, this trend was not observed. HCPs and physicians reported significantly lower support for comprehensive SFPs in indoor leisure and private settings and outdoors when compared to hospital, schools and workplaces. In Portugal, those settings are not regulated by law, allowing exploring the social norm.

3. *The Portuguese smoking ban is effective in a pro-smoking environment.*

This post-ban survey explored the effectiveness of the Portuguese partial smoking ban in a pro-smoking environment targeting a specific population, specifically transportation by taxi in the city of Lisbon. This setting was intentionally chosen as a "natural environment" where boundaries between private and public, regulated and non-regulated settings are blurred, allowing exploring social norm change. The post-ban survey shows that social smoking norms suffered little change after the ban implementation. In addition, participants reported poor enforcement of and patchy compliance with the ban, i.e. the ban was not effective on this particular setting.

Thus, we may conclude that poor TC awareness by HCPs/physicians is associated with restricted change on social smoking norms.

In Portugal, few surveys have investigated compliance with and enforcement of the partial smoking ban. Nevertheless, at least two post-ban nation-wide cross-sectional studies have evaluated the effectiveness of the smoke-free policy, respectively:

1. A cross-sectional observational survey conducted during 2010-2011[77]
2. A computer-assisted telephone interview (CATI) population-based survey carried out in 2012[78]

These two studies report patchy compliance with the ban, frequent law breaches and poor enforcement. In addition, the CATI survey also reports low assertiveness regarding protection against SHS.[77,78] In sum, these two surveys observed restricted social norm change regarding SHS exposure and SFP. Thus the findings of this thesis are in line with other studies.

4.4 Main limitations

This research has both strengths and limitations. Being an unfunded and a non-multicenter collaboration research project are major limitations. This justifies the study design and the choices made. Furthermore, the target population is difficult to survey. Several authors have consistently reported rather low response rates when surveying HCPs'/physicians' smoking behaviour and tobacco control attitudes and practices. On the other hand, it is particularly challenging to obtain a representative sample of Portuguese physicians including the different specialties and healthcare settings (private and public health systems; primary care, hospital-based; academics, clinicians, public health and health managers). Nationwide physicians' databases were not available when the study was planned. Consequently, several study limitations should be stressed. Above all, the cross-sectional design only allows identifying associations, neither causal relationships nor trends over time. In addition, the following methodological issues should be considered while extrapolating the study findings, mainly sampling methods and data-gathering tools which were based on self-reported questionnaires. Consequently, study findings are limited by sampling bias: they apply to a sample of physicians who attended two major medical conferences; and to a sample of HCPs of one hospital center. In addition, the methodology used in the taxi survey limits generalization to different populations. Furthermore, results may be distorted by information, measurement and social desirability bias, aspects that have been discussed in full when reporting each study. Moreover, this research focused mainly in cigarette/cigarillos/cigars/pipe smoking behavior and did not assess other emergent patterns of tobacco use such as smokeless tobacco, water-pipe or e-cigarette. Future studies should explore Portuguese HCPs' attitudes, behaviors and practices on emergent patterns of tobacco use and e-cigarettes. Despite these limitations, to our knowledge is one of the few surveys that focused on Portuguese HCPs' engagement in tobacco control and obtained good response rates.

4.5 Concluding remarks and implications for medical and continuing education, healthcare practice, policy and research

The high smoking prevalence among Portuguese HCPs and physicians; the high smoking rate in hospital premises; the high uptake of regular smoking during medical school; as well as poor engagement of physicians in tobacco control are not consistent with either the awareness of tobacco public health burden, or the need for medical role model and leadership. We may conclude that Portugal is failing to prevent tobacco use and to promote cessation among

HCPs/physicians; as well is failing to engage physicians in tobacco control. Notably, limited TC awareness amongst physicians/HCPs greatly restricts capacity building in tobacco control.

Likewise, prevention of tobacco use and tobacco cessation among the Portuguese population is undermined as further illustrated in this dissertation final chapter; social norm change towards tobacco denormalisation and a tobacco-free society is seriously compromised in Portugal. These trends highlight the need for comprehensive tobacco control programmes targeting physicians and other HCPs, as well as medical and health science students. There is a need for health promotion campaigns raising awareness on tobacco use and SHS health hazards, tobacco addiction and the benefits of quitting; as well as promoting and enforcing smoke-free environments, and particularly smoke-free healthcare services and smoke-free hospitals/health sciences university campus; promoting cessation by offering incentives to quit and effective support to HCPs; and highlighting HCPs as role-models and non-smokers exemplars. Similarly, preventing tobacco use in medical schools and disseminating medical education in TC should be made top priorities.

As Pellegrino has stated, "students are still malleable as they assume roles and models on the way to their formation".[79,p383] Medical school is the ideal setting for preventing smoking behaviour and shaping attitudes to preventive care among future physicians. The role of medical students as exemplars of healthy and non-smoking behaviour as well as health advocates should be highlighted in curricula as core competences of professionalism. This should include participation in smoking cessation and TC activities.[80] Surveys assessing tobacco use and determinants of smoking behaviour among medical students should be developed. Evidence-based and tailored smoking cessation programmes targeting medical students and HCPs should be implemented. Finally, comprehensive TC policies while preventing youth smoking will also reduce smoking among physicians.[48]

Notably, in order to promote tobacco control in countries such as Portugal where tobacco use is prevalent among HCPs, it is crucial to implement cessation programmes targeting medical/health sciences students, physicians and other healthcare workers, both in academic and healthcare settings. These programmes should be funded and evidence-based; they should be linked to comprehensive TC training focusing on tobacco health hazards, the role of physicians/HCPs in TC, TC policy and capacity building and not only tobacco cessation skills.

An effective national health promotion strategy should prioritise comprehensive, integrated and adequately-funded TC programmes led by experts and actively engaging medical/health sciences schools, medical associations and HCPs networks/societies, hospital managers and healthcare systems.

Continuing education combined with system changes can provide the grounding for behavior change. Health systems' engagement and organisational change, as well as training based on

assessed needs, should be the core components of a TC national programme targeting HCPs and physicians.

Healthcare systems should foster and develop a comprehensive TC policy, in order to:

- Monitor tobacco use and TC attitudes among HCPs
- Promote and enforce SFPs, including hospital/university smoke-free campus
- Implement a system-delivery of systematic cessation advice and support
- Engage and train HCPs with brief cessation intervention
- Engage and train HCPs with capacity building and TC advocacy
- Strengthen participation of and partnership with NGOs and civil society
- Raise public awareness regarding tobacco addiction, tobacco use and SHS health hazards, and the benefits of tobacco cessation
- Promote and adequately support smoking cessation

On the other hand, high smoking rates among HCPs/physicians are an important TC indicator that clearly points out that the tobacco epidemic is still immature in Portugal. By other words, general population smoking prevalence will not level off, unless that comprehensive TC policies are effectively implemented and enforced. This calls for medical and civil society leadership in order to advance TC in Portugal. Finally, effective TC advocacy relies on both a strong communication strategy and a strong research agenda. Particularly, patterns and trends of tobacco use and exposure to SHS should be monitored; as well as the effectiveness and the cost-effectiveness of TC policies and their impact on population health and welfare. There is a need to build a strong network of TC researchers and effective collaboration partnerships among academics, the public health community, clinicians, healthcare managers, NGOs, patients' and HCPs' associations, the media, opinion makers, decision-makers, governments and the civil society as large.

Chapter 5

Tobacco control in Portugal: the need for a national advocacy strategy

Tobacco control in Portugal: the need for a national advocacy strategy

5.1 Tobacco Control Progress in Portugal: the need for advocacy and civil society leadership.

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The on-line version of this article is available at: http://www.elsevier.pt/en/revistas/revista-portuguesa-pneumologia-320/artigo/tobacco-control-progress-in-portugal-the-need-for-90368878. Last accessed: 17th January 2016.

5.2 What this study adds.

Rev Port Pneumol. 2014;20(6):289–292

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EDITORIAL

Tobacco control progress in Portugal: The need for advocacy and civil society leadership

Para o progresso do controlo de tabagismo em Portugal: a necessidade de activismo e liderança da sociedade civil

Tobacco remains a leading cause and an aggravating factor of many diseases, mainly respiratory and cardiovascular diseases, cancer, tuberculosis, diabetes, and childhood diseases.[1] In addition, tobacco especially harms those who are most vulnerable, exacerbating health and social inequalities. Also, as a major cause of healthcare costs and loss of productivity, it jeopardizes a country's economy and welfare. However, it is possible to change the paradigm: tobacco is the single most preventable cause of death.[1,2] The globalization of tobacco is caused by the tobacco industry (TI).[1,2] Hence, the key strategy to curb the epidemic is to counteract the TI by enacting and enforcing legislation to regulate TI activities; raising awareness about tobacco health hazards; actively engaging civil society in tobacco control (TC).[1–3] Comprehensive TC policies, as part of a sustained and appropriately funded programme, can reduce the burden of tobacco disease. These are evidence-based, follow practices from countries that have made major improvements, and are outlined in the first international public health treaty led by the World Health Organization: Framework Convention on TC (WHO-FCTC).[1,2] Portugal has one of the lowest crude smoking prevalence rates and one of the highest for never-smoking in Europe.[4,5] However, crude prevalence comparisons can be misleading since they do not take into account the age structure of the population. In Portugal, tobacco use is high in young adults; it remains stable or slightly increases among male age-groups 15–54 years and decreases in males above 55 years; while it is steadily increasing among all women age-groups under 70 years.[4,6,7] Furthermore, recent studies report an increase in uptake among young people.[7] For many decades, Portugal was less advanced in terms of the tobacco epidemic due to historical and socioeconomic determinants, which kept the crude smoking prevalence rate lower than that in most European countries. Portuguese females started smoking later than other Europeans, due to sociocultural factors and delays in changes to gender social roles which led to the overall prevalence rate being masked by lower female smoking rates. Note too that Portugal has one of the highest ageing indexes in Europe.[8] This considerably reduces the overall prevalence rate and over-evaluates never-smoking rates. Therefore, other relevant TC indicators should be analyzed, focusing on age-gender specific trends and indicators that are less influenced by demographics such as the following:

- Among smokers, motivation to quit is low; less than half try to quit; few use cessation aids.[5] Additionally, the number of smokers trying to quit or giving up with cessation support has been steadily going down since 2006.[5,7]
- Social permissiveness and exposure to second-hand tobacco smoke (SHS) are common.[5,9–11]
- Poor enforcement and breaches of smoke-free policy (SFP) are frequent.[9,10,12]
- Civil society participation and capacity building in TC are rather poor.[9,13–15]
- Healthcare professionals (HCPs) are not aware of their role in TC.[15,16]
- Portugal scores very low on the European tobacco control scale and its score has been steadily going down.[13]
- Portugal is one of the top countries in the WHO Euro region for TI sponsorship through social responsibility corporation projects and ''charitable contributions''.[17]
- TC research is rather scarce.[6,18] Table 1 depicts the data supporting these statements.

These trends mirror Portugal's failure to enact, implement and enforce TC policies and emphasize the need for a comprehensive and sustained national strategy. Moreover, given the current socioeconomic crisis this situation is even more critical. In 2012, national programmes on respiratory health, cardiovascular, cancer, mental health and TC were approved. This is certainly an opportunity to improve respiratory and global health in Portugal but without appropriate funding and advocacy promoting civil society participation,

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Table 1 Facts and data supporting Portugal tobacco control analysis.

Self-reported SHS exposure in bars and restaurants

The 2012 Eurobarometer reports a declining trend in SHS exposure in EU bars and restaurants, when compared to 2009 data. Portugal was one of the few countries where this declining trend was not observed: SHS increased in bars and remain stable in restaurants.[5]

Children exposure to SHS assessed by self-report and SHS biomarkers

52.2% of a 4th grade Portuguese children national sample report at least one smoking parent and, therefore, are potentially exposed to SHS in the home and in the car. Most of those children reporting parents' smoking declare that they smoke indoors: 62.9% in the home and 46.9% in the car (non-published research: Precioso et al., 2011). A European study has compared SHS exposure among children and their mothers using SHS biomarkers (urine/hair cotinine). Portuguese children were among the most exposed, when compared with other 16 European countries (non-published research: Reis et al., Democophes study 2012).

Self-reported SHS exposure: regional surveys

Two regional surveys (Chaves[11] and Covilhã), have reported that 46.2% and 48.0% of the participants, respectively, were exposed to SHS anywhere (home/school/workplace/leisure settings). In both studies self-reported SHS exposure was higher in leisure settings (33.0% and 36.8%, respectively), where vulnerable populations such as children, teens and young adults should be protected by law. Self-reported exposure in the home and workplaces was similar to the pre-ban period.[11] In Covilhã, the great majority of the participants would allow smoking in the home/car; only 13.6% of the participants would assertively ask smokers not to smoke. (non-published research: Ravara et al., 2013).

SHS exposure in hospitality venues and other settings assessed by SHS biomarkers

Several studies report high SHS exposure of employees in restaurants, bars, discos, casinos, mental health services. Ventilation does not protect workers and clients from SHS exposure: SHS exposure assessed by biomarkers remains high in non-smoking areas in places allowing smoking (non-published research: Calheiros et al., 2008–2010; Reis et al., 2010–2011).

Enforcement of and Compliance with the smoking ban; assertiveness regarding SHS exposure: population-based surveys

Several authors report that the Portuguese partial smoking ban is vulnerable to breaches and poorly enforced, especially in venues allowing exemptions, among vehicle and night-shift workers and high smoking prevalence environments.[9,10,12] In 2012, a computer-assisted telephone interview national survey was carried out. Patchy compliance with the ban was reported in general by 55% of the participants: 47.9% in restaurants/cafes; 47.9% in universities; 37.2% in schools; 25.7% in workplaces; 24.4% in universities; 4.6% in public transports, $p < 0.001$. Of the daily-smokers, 71% smoked in the home and 64.3% in the car; only 30.3% of non-smokers would ask smokers not to smoke indoors.[10]

Tobacco Control activity measured by an objective scale and TC population awareness

Joossens and Raw using the European TC Scale, an objective scale of TC policies, have consistently reported poor TC activity in Portugal over the last decade, i.e. following Portugal ratification of the WHO-Framework on Tobacco Control. Currently, Portugal ranks at the bottom of Europe, very far from Spain and France.[13] A recent study has surveyed citizens' support for a tobacco end game strategy in 18th European countries. While the overall support was 34.9%, Portuguese citizens reported the lowest support (18.0%). Contrastingly, the Southern Europe region reported the highest support (42.5%).[14]

Smoking trends and engagement of HCPs and physicians in tobacco control

Several authors report high smoking rates among Portuguese HCPs/physicians.[6,15,16] Recent surveys report that Portuguese physicians do not act as role-models, i.e. neither as non-smokers examplars nor as tobacco control leaders, when compared with the general population.[15,16] HCPs/physicians' tobacco control attitudes and support for smoke-free policy are not based in public health science. Portuguese physicians' engagement in tobacco control is rather poor.[15,16]

TC advocacy and activism

In Portugal, TC advocacy is led by few underfunded NGOs and HCP associations, such as the National Coalition on TC (COPPT), the Portuguese Societies of Pulmonology and Cardiology, Portuguese Cancer League, TC experts' forum (Smoke-free Portugal) among others. Despite limited resources, these organizations have struggled to move TC. To date, however, they have not been successful in launching a concerted effort to advance TC. The Portuguese Medical Association has neither a clear commitment to tobacco control nor an official policy on tobacco use and advocacy.[16] Following the severe recession that Portugal is suffering, TC activism and mobilization have stalled.

Tobacco industry sponsorship

Evrengil et al. analyzed the tobacco industry sponsorship in several countries through social responsibility corporation projects and ''charitable contributions''. During 2012, in the WHO Euro Region, Portugal ranked 4th in the number of such projects.[17]

Tobacco control research

In 2005, Fraga et al. carried out a literature review and reported that Portugal was among the European countries with less TC research.[6] In 2014, Willessem et al. carried out a similar bibliometric analysis reporting the same trend regarding Portugal.[18]

success is unlikely. Governments and legislators are crucial but are not the only actors. Within civil society, HCPs and its organizations should have a leadership role[1–3] as is the case with several European Non-Governmental Organizations (NGOs) that have played a crucial role in coordinating EU Tobacco Directive (TPD) advocacy among NGOs and policy-makers throughout Europe. Sharing resources and joining efforts, NGOs raise awareness of the devastating consequences of tobacco and SHS; disseminate public health science and evidence-based TC policies; identify where there is a need to legislate or improve legislation; provide information to stakeholders; expose the TI strategies, their front groups and the vested interests in this field, and show how they interfere in decision-making and jeopardize public health. HCPs, academics, educators, lawyers, social workers, NGOs, journalists, media, etc., should all team up to empower civil society and advance TC in Portugal. Meanwhile, due to the tobacco industry's interference in policy-making, weak advocacy efforts, underfunding and poor enforcement of TC policies, few European countries have significantly progressed in TC.[13,15,19] On the one hand, smoking prevalence depends on the country's epidemic stage and levels of income and wellbeing.[20] On the other hand, countries with higher levels of public sector corruption and governmental ineffectiveness present higher smoking rates and non-comprehensive SFPs.[20,21] In contrast, those countries that have led the way in TC such us Australia, Canada, USA, Ireland, UK, and Uruguay, can demonstrate a sustained downward trend in smoking rates, both by reducing the uptake of youth smoking and by promoting cessation among smokers. In particular, the USA and the UK have reported a more than 50% decrease in smoking prevalence rates.[1,13] This achievement has not, however, been easy. It was driven by professional hard work and sustained commitment over 50 years to implement strong policies and to actively engage all social actors.[1] Turning to Portugal, following the ratification of the WHO-FCTC, TC activity has been steadily going down compared to other EU countries.[13] This is an unacceptable paradox. The consequences speak for themselves: tobacco use is consistently rising among young people and women.[4,6,7] This will cause a major burden of premature death, disease and disability, and will severely damage Portugal's economy and welfare. As stated by TC leaders, we cannot ignore the fact that ''tobacco smoking is a commercially driven behaviour'' and that the powerful interference of commercial vested interests has been blocking TC progress. Moreover, ''the necessary political and medical leadership has so far been lacking''.[19] The solution, however, does not depend entirely on hospitals or medical care but largely on health policy decision-making, implementation and monitoring.[1–3,19] The main WHO-FCTC goal is to promote TC implementation providing support through international collaboration.[2] However, some countries such as Portugal remain isolated; therefore, it is extremely difficult to promote action and leadership in TC. Likewise, this exposes the lack of advocacy and stresses the urgent need for a concerted national strategy. There is an urgent need for change. Portuguese citizens and the public health community should demand transparency and accountability. Recognizing the problem is the first step. Only by breaking the silence and working together can progress in tobacco control in Portugal become a reality. This is not an easy task. It will need proper funding, professional team work and perseverance; improvement will happen but will take time. WHO can support and guide these efforts, the European NGOs and international TC networks will support the Portuguese movement. Focusing on the main priorities is crucial: (1) a comprehensive smoke-free policy; (2) the implementation of TPD and (3) tobacco taxes directive. Following the EU NGOs steps, the Movement of Portuguese NGOs towards TC was launched in April 2013. This movement is, however, in its infancy. The authors of this paper warmly welcome Portuguese citizens, HCPs and NGOs such as the Pulmonology Society, Lung Foundation, Respira, Cancer League, TC Coalition, GPs, Public Health and Epidemiology Associations, Cardiology, Pediatrics and Allergy Societies, Asthmatic Association, Medical, Nurses, Pharmacists, Medical and Health Sciences Students and other HCPs Associations, as well as many other NGOs to the TC movement and encourage all to work together in strong partnership and concerted effort towards the progress of tobacco control. ''Remember the common goal and the common enemy – when we are not united, the tobacco industry wins'' (Berteletti F, personal communication, ICPTC13, Lisbon, November 14th 2013).

Authorship

SBR conceived the paper and drafted the manuscript. NM wrote part of the manuscript. All the authors critically reviewed, contributed to and approved the final manuscript.

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5.2 What this study adds

This research evaluates and discusses tobacco control in Portugal using an integrated approach: linking the role of healthcare professionals to medical and continuing education, health systems practice, health policy and research, and the stage of the tobacco epidemic in Portugal; pointing to the need for systemic policy development and community-oriented advocacy based on the following:

- empowerment, engagement and concerted action of civil society
- healthcare professionals' training, engagement and leadership
- a strong tobacco control research agenda and dissemination of scientific findings
- a sustained communication strategy engaging the media, healthcare professionals, policy-makers, governments and civil society
- decision makers' information and accountability

In addition, international cooperation accordingly to WHO-FCTC goals should play a key role supporting countries that still have a long way to go towards effective tobacco control.

Chapter 6

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