UNIVERSITAT DE BARCELONA

Estratègies de control del tabaquisme i polítiques de fum ambiental del tabac en l'àmbit de la salut mental

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Tesi presentada per:

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A fi d'optar al títol de Doctor

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RESUM

Antecedents

La prevalença de tabaquisme en els pacients amb trastorns mentals és més alta que en la població general i pot arribar fins a un 80% en els pacients ingressats en unitats hospitalàries de salut mental. De fet, els pacients amb trastorns mentals greus poden arribar a morir uns 25-30 anys de mitjana abans que la població general, habitualment per malalties causades o agreujades pel tabac. No obstant, l'abordatge del tabaquisme als centres de salut mental ha estat habitualment ignorat i d'altra banda, les lleis de prohibició de fumar en llocs de treball, centres sanitaris i altres espais públics han estat més permissives amb les unitats d'ingrés de psiquiatria permetent fumar als pacients al seu interior en cambres especials.

Hipòtesis

1. Els dispositius de salut mental de Catalunya tenen uns nivells baixos de control del tabaquisme, pel que fa al control del consum de tabac als espais sanitaris, d'intervenció clínica sobre aquest consum i de formació dels professionals.

2. Els dispositius de salut mental sense normatives de prohibició del consum de tabac o amb normatives parcials (aquelles en les que es permet fumar només als exteriors o que permeten cambres especials interiors per fumar) tenen nivells de fum ambiental del tabac (partícules aèries, $PM_{2.5}$, com a marcador de l'exposició ambiental) superiors als obtinguts en els dispositius amb normatives de prohibició total de fumar (tant en àrees interiors com en exteriors).

3. En els dispositius amb nivells més elevats de $PM_{2.5}$, tant els pacients com els treballadors tenen una percepció d'exposició al fum ambiental del tabac més elevada, i en conseqüència, una major percepció d'ambient perjudicial per a la salut.

4. L'exposició perllongada al fum ambiental del tabac té efectes perjudicials en el malestar psicològic de la població no fumadora.

Objectius

1. Examinar les estratègies de control del tabaquisme implementades a les institucions d'hospitalització psiquiàtrica de Catalunya i identificar àrees de millora.

2. Avaluar el nivell de fum ambiental del tabac a les unitats de salut mental hospitalària de Catalunya segons el tipus de normativa de control del consum de tabac, utilitzant les $PM_{2.5}$ com a marcador objectiu.

3. Comparar la percepció de nivell d'exposició al fum ambiental del tabac per part de treballadors i pacients amb els resultats obtinguts mitjançant la mesura objectiva de $PM_{2.5}$ i descriure la preferència per les diferents normatives de control del consum de tabac.

4. Avaluar la possible associació entre malestar psicològic i exposició al fum ambiental del tabac en la població adulta espanyola.

Metodologia

Les dades d'aquesta tesi provenen de tres estudis transversals diferents. En el primer estudi es va utilitzar una enquesta sobre quatre dimensions del control del tabaquisme (intervenció clínica sobre el consum de tabac, formació i compromís dels professionals, control dels espais on es permet/prohibeix fumar i comunicació de les normatives sense

fum). L'enquesta es va enviar als caps d'unitats d'ingrés hospitalari, hospitals de dia i centres de dia en salut mental de Catalunya (n=186). En el segon estudi es va mesurar el nivell de fum ambiental de tabac a les unitats hospitalàries de salut mental de Catalunya (n=64) mitjançant les $PM_{2.5}$. A la vegada, es va passar una enquesta als pacients i professionals d'aquestes 64 unitats (n=600 i n=575, respectivament) de les unitats sobre l'exposició percebuda al fum del tabac i sobre les preferències per diferents tipus de normatives de control del consum de tabac als dispositius de salut mental. El tercer estudi utilitza les dades de població mai-fumadora adulta (n=11.214) de la Encuesta Nacional de Salud de España (2011-2012).

Resultats

El control del tabaquisme als dispositius de salut mental era generalment baix, especialment quant a les àrees d'intervenció clínica en el consum de tabac sobre aquests pacients, la manca de disponibilitat de fàrmacs per deixar de fumar pels pacients del dispositiu i la poca formació dels professionals en aquest tema. Aquests resultats eren especialment baixos en el cas dels Centres de Dia. D'altra banda, es va detectar que només aquells dispositius amb normatives de prohibició de fumar tant en els interiors com en els exteriors tenien nivells de $PM_{2.5}$ a zones interiors dels dispositius dins dels nivells recomanats per l'OMS i que els dispositius que permetien als pacients fumar a zones exteriors o interiors podien doblar o quintuplicar aquests nivells recomanats. No obstant, els professionals i pacients tenien una baixa percepció d'estar exposats al fum ambiental del tabac a nivells perjudicials per a la salut. En el cas dels professionals, aquesta percepció d'estar exposats al fum ambiental del tabac era més baixa en metges que en infermeres, en canvi els metges tenien una prevalença de consum de tabac per sota de la població general i les infermeres per sobre. Així mateix, una majoria de

pacients i professionals apostaven per deixar fumar als pacients als exteriors dels dispositius, tot i que no als interiors. Finalment, es va detectar que l'exposició passiva al fum ambiental del tabac podria augmentar el malestar psicològic de les persones mai-fumadores exposades al fum ambiental del tabac a les seves llars.

Conclusions

El control del tabaquisme als dispositius de salut mental hospitalaris i especialment en centres de dia és baix. Aquells dispositius amb normatives de prohibició total de fumar en interiors i exteriors són els únics que protegeixen adequadament del fum ambiental del tabac. Els professionals i els pacients generalment infravaloren el nivell de fum ambiental als interiors, i per tant el seu efecte perjudicial per a la salut. Això podria tenir alguna influència en la major preferència per normatives de prohibició de fumar menys restrictives. El fum ambiental del tabac podria afectar el malestar psicològic dels pacients ingressats en dispositius de mitjana i llarga estada.

ABSTRACT

Background

The prevalence of smoking in patients with mental disorders is higher than in the general population. This prevalence can rise to 80% in patients admitted in mental health wards. Consequently, life expectancy for people with severe mental disorders may decrease by up to 25-30 years in contrast to the general population, generally because of conditions caused or worsened by smoking. However, smoking interventions have usually been neglected. Moreover, smoke-free policies in public places and workplaces, including hospitals and their campuses, have generally exempted mental health wards.

Hypotheses

1. Mental health wards in Catalonia have implemented low levels of tobacco control strategies, regarding smoke-free spaces, clinical intervention on smoking cessation, and staff training on smoking cessation.

2. Mental health wards without smoking bans or with partial bans (allowing smoking outdoors or with indoor smoking rooms) have higher particulate air matter levels ($PM_{2.5}$ as a marker of second-hand smoke) than those wards with total smoking bans (not allowing smoking indoor nor outdoors).

3. In the wards with high levels of $PM_{2.5}$, both patients and staff have a high perception of being exposed to second-hand smoke and, consequently, have a high level of perception of the potential harmful health effects from this exposure.

4. Long-term exposure to second-hand smoke has harmful effects on psychological distress in the adult population of never-smokers.

Objectives

1. To examine tobacco control strategies undertaken in psychiatric inpatient services in Catalonia, and to identify unmet needs.

2. To objectively evaluate the levels of second-hand smoke in psychiatric inpatient units in Catalonia according to the type of smoking ban implemented, using $PM_{2.5}$ as a marker of second-hand smoke.

3. To compare the self-reported level of exposure to SHS of patients and staff in psychiatric units to $PM_{2.5}$ concentrations as an objective marker of second-hand smoke, and to describe the preferences for different types of smoking bans.

4. To examine the potential association between second-hand smoke exposure and psychological distress in the adult Spanish population.

Methods

The data derives from three cross-sectional studies. For the first study we used a questionnaire about four dimensions of tobacco control (clinical intervention on smoking, staff training and commitment, management of smoking areas, and communication of the smoke-free policies). The questionnaire was sent to the managers of mental health wards, day hospitals and day centres of Catalonia (n=186). For the second study we measured the level of second-hand smoke in mental health wards of Catalonia (n=64) through the measurement of $PM_{2.5}$. At the same time, we administered a questionnaire to the inpatients and professionals from these 64 wards (n=600 and

n=575, respectively) about their self-perceived exposure to second-hand smoke and their preference on different types of smoking bans. The third study uses a sample of adult never-smokers (n=11,214) from the Spanish National Health Interview Survey (2011-2012).

Results

Tobacco control in mental health-care services was usually low, especially with respect to the clinical intervention on patients' tobacco use, the availability of pharmacotherapy for smoking cessation and the lack of professionals' training in this field. These results were especially poor in the Day Centres. Moreover, it was found that only those services with total smoke-free bans implemented (not allowing smoking indoors nor outdoors) had levels of $PM_{2.5}$ concentrations within the WHO recommended levels. The services with partial bans implemented (allowing smoking only outdoors or allowing indoor smoking) were two or five times over the recommended WHO levels. However, patients and professionals had a low perception of being exposed to environmental tobacco smoke at harmful levels. Nurses had a higher perception of being moderately or highly exposed to second-hand smoke than physicians, whereas physicians' smoking prevalence was below that found for the general population and nurses had a smoking prevalence over the general population. A majority of patients and professionals agreed with allowing patients smoke outdoors. Finally, we found that passive exposure to second-hand smoke can increase psychological distress in never-smokers exposed to environmental tobacco smoke in their homes.

Conclusions

Tobacco control in hospital mental health services and especially in day centres is low. Only wards with total smoke-free bans implemented adequately protected against second-hand smoke. Patients and staff generally underestimate the level of second-hand smoke in the service, and consequently, underestimate the potential harmful health effects. This could influence the preference of patients and staff for less restrictive smoking bans. Second-hand smoke could affect psychological distress of patients in medium- and long-stay patients units.

1. INTRODUCCIÓ

1.1. El tabaquisme

1.1.1. Prevalença del tabaquisme, efectes per a la salut i mortalitat atribuïda

El tabac és la primera causa de morbi-mortalitat evitable als països desenvolupats. El tabac causa 5,4 milions de morts cada any a tot el món (dades del 2005) i s'estima que al 2030 se li podrien atribuir més de 8,3 milions de morts (1). Al món, el 10% de les morts s'atribueixen al tabac i a Europa el 16% (1,2). La regió europea té la prevalença més alta de consum de tabac de totes les altres regions segons l'OMS (Àfrica, Sud-est Asiàtic, Amèrica, Est Mediterrani i Pacífic Oest) (2). No obstant, l'epidèmia del consum de tabac ha evolucionat a diferent ritme tal i com van descriure López et al. (3). Al Regne Unit, un dels primers països afectats, la prevalença està decreixent des dels anys 60 (4). En d'altres països la prevalença sembla haver arribat al seu punt màxim només en l'última dècada (Grècia, Àustria, Bulgària, Espanya i Letònia) i en d'altres podria estar encara augmentant (Eslovènia, República Txeca) (5,6).

La prevalença de fumadors a Espanya ha evolucionat a la baixa des del 1987 al 2006 segons dades des la Encuesta Nacional de Salud de España (ENSE): En els homes es troba un descens relatiu promig anual del 2,2% en la prevalença de fumadors i en les dones s'observa un increment del 1,2% anual fins l'any 2001 i a partir de llavors un descens anual del 2,9% (7). Les últimes dades de l'ENSE (2011-2012) (8) mostren una prevalença de fumadors del 26,9%, (23,9% de fumadors diaris i 3,0% de fumadors ocasionals), un 19,6% d'exfumadors, i un 53,5% de població que mai ha fumat.

A Catalunya, les dades de l'última Enquesta de Salut de Catalunya (9), mostren una prevalença de consum de tabac diari i ocasional del 28,5% de la població major de 15 anys. La prevalença de consum ha evolucionat lleugerament a la baixa des dels anys 90

amb un decreixement més acusat en els homes que en les dones, tot i que els homes tenen prevalences més altes de consum. Així, segons les dades del 2012, la prevalença de consum en els homes se situa en un 34,2% i en un 22,9% en les dones.

El efectes nocius del tabac són coneguts des de fa dècades. Els principals efectes nocius sobre la salut recauen en les malalties cardiovasculars (infart de miocardi, hipertensió, aneurismes, accidents cerebrovasculars, etc.), el càncer (pulmó, laringe, faringe, tràquea, esòfag, estómac, pàncrees, fetge, ronyons, bufeta, colon i recte, coll uterí o medul·la òssia i sang) i en les malalties respiratòries (malaltia pulmonar obstructiva crònica (MPOC), emfisema i bronquitis) (10).

Les desigualtats socials en el factor de la salut per raó de la classe social, tenen un impacte en la salut de la població (11). Actualment, el consum de tabac s'està associant cada cop més a poblacions de nivells socioeconòmics baixos (12) i als trastorns mentals (13), fets que contribueixen significativament a la desigualtat en matèria de salut.

1.1.2. El fum ambiental del tabac

El fum ambiental del tabac (FAT) és una barreja de milers de components, molts dels quals són tòxics com ara el monòxid de carboni, l'arsènic o l'amoníac, i d'altres components cancerígens, com per exemple les nitrosamines, els benzopirens o les amines aromàtiques (14). Aquesta mescla prové del fum exhalat pel fumador (corrent principal) i del fum després de la punta de la cigarreta encesa (corrent secundària).

S'ha demostrat que l'exposició al FAT incrementa la mortalitat i morbiditat (14,15). Concretament, en adults, els efectes adversos principals corresponen al càncer de pulmó, MPOC, malalties cardiovasculars i accident vascular cerebral, que poden augmentar en un 25% (15,16). També s'han demostrat els efectes perjudicials del FAT

en els infants (17) amb increments del risc de mort sobtada, d'infeccions del tracte respiratori inferior, asma, otitis, meningitis, i de reducció de la funció pulmonar (15,18).

Ja als anys 90 el National Institute for Occupational Safety Health als Estats Units va declarar que el FAT complia els criteris per ser classificat com un carcinogen en els llocs de treball, situant-lo al mateix nivell que d'altres carcinògens com el benzè o l'asbest (19). Malauradament, malgrat aquest reconeixement dels efectes perjudicials del FAT per a la salut des de fa dècades, encara hi ha espais que habitualment queden exempts de les polítiques lliures de fum, com per exemple les unitats hospitalàries de salut mental (20,21).

El nombre de països europeus que prohibeixen fumar en tots els espais públics s'ha incrementat de quatre països al 2007 a 9 al 2012, tot i que el nivell de compliment és variable (2,21). En els països on s'han implementat àmplies polítiques lliures de fum, o polítiques que prohibeixen fumar en espais públics i de treball interiors i exteriors, la principal font d'exposició de la població general al FAT són les llars (22) i els cotxes (6).

L'exposició al FAT es pot mesurar a través de diferents mètodes, com els mètodes directes o objectius (marcadors aèris o biomarcadors en fluids orgànics) i els indirectes o subjectius (mètodes observacionals o autoreportats a través de qüestionaris) (23), que permeten fer mesures ambientals o personals d'aquesta exposició. En les mesures personals, el mètode objectiu més utilitzat és la concentració de la cotinina (metabòlit de la nicotina) en la saliva, l'orina, plasma o altres matrius biològiques. Aquest és un mètode molt específic ja que l'única font de procedència de la cotinina és el tabac. Un altre mètode de mesura de l'exposició personal al FAT són els qüestionaris. Els qüestionaris s'utilitzen àmpliament per ser simples d'administrar i més cost-efectius

respecte als biomarcadors i el marcadors ambientals (15,24). Els qüestionaris permeten recollir informació sobre el lloc d'exposició al FAT, el temps d'exposició per dia i els moments d'exposició, entre d'altres variables, en un temps determinat i s'han mostrat vàlids alhora de recollir aquesta informació en una àmplia varietat de poblacions (25).

Hi ha diversos marcadors ambientals del FAT que s'han utilitzat, com el monòxid de carboni, els hidrocarburs policíclics aromàtics, i els òxids de nitrogen o aldehids, tot i que els marcadors més utilitzats en l'actualitat són la nicotina aèria i les partícules fines respirables de diàmetre igual o menor a 2,5 micres ($PM_{2.5}$). La mesura de nicotina aèria té l'avantatge que és específica del tabac i els mètodes analítics són sensibles a baixes concentracions (26). La mesura del FAT mitjançant les $PM_{2.5}$ tenen l'avantatge d'oferir mesures contínues però no són específiques del tabac (26) perquè poden provenir d'altres fonts de combustió. Malgrat això, en absència d'altres fonts de combustió, es pot assegurar que prop del 90% de les seves concentracions provenen del fum del tabac (27). A més, el mètode de les $PM_{2.5}$ obté resultats similars als obtinguts amb les concentracions de nicotina aèria (correlacions que van des del 0,64 al 0,98) (28-30).

A l'hora de mesurar les concentracions de FAT als espais mitjançant mesures objectives, s'han de tenir en compte també algunes variables que és important registrar. El nivell de concentració de FAT als espais, especialment i concretament en els espais interiors, depèn de diferents factors, principalment el nombre de fumadors en l'espai, el nombre de cigarretes que s'encenen en un període de temps determinat, les condicions de ventilació que hi ha als espais i el volum de l'espai, entre d'altres (26).

1.1.3. Estratègies de control del tabaquisme

Deixar de fumar està associat amb una reducció significativa de les malalties no transmissibles, principalment càncer, malalties cardiovasculars, diabetis i malalties respiratòries. Aquestes malalties representen el 63% de totes les morts al món segons dades del 2008 (31). Igualment, la implantació de polítiques lliures de fum que protegeixen de l'exposició passiva al FAT han tingut conseqüències beneficioses a nivell de salut pública, sobretot respecte a les malalties cardiovasculars i els símptomes respiratoris (32-34).

A fi de controlar l'epidèmia del tabaquisme, l'OMS a través del seu Conveni Marc per al Control del Tabac (CMCT) va publicar el 2008 els fonaments d'una estratègia anomenada amb l'acrònim MPOWER: 1) *Monitoring*, vigilar el consum de tabac i les mesures de prevenció; 2) *Protecting*, protegir a la població de l'exposició al fum ambiental del tabac; 3) *Offering*, oferir ajuda per deixar el consum de tabac; 4) *Warning*; advertir dels perills del tabac per a la salut, 5) *Enforcing*; fer complir les prohibicions sobre publicitat, promoció i patrocini dels productes el tabac, i 6) *Raising*: augmentar els impostos del tabac.

La CMCT va ser adoptada per unanimitat per l'Assemblea Mundial de la Salut el 2003 i 50 dels 53 estats membres de la regió europea van signar el tractat i el 2005 va entrar en vigor (2,35).

A Catalunya, el Departament de Salut de la Generalitat de Catalunya, des de l'Agència de Salut Pública de Catalunya, compta amb diferents estratègies i programes a fi d'augmentar el control del tabaquisme a Catalunya. Dins l'àmbit dels centres sanitaris s'han posat en marxa dos grans programes, el Programa d'Atenció Primària sense Fum (papsf, http://www.papsf.cat) i la Xarxa Catalana d'Hospitals sense Fum (XCHsF,

http://www.xchsf.com) i és en el context d'aquesta última que s'ha desenvolupat el treball d'aquesta tesi.

La XCHsF es va establir el 1999 per incentivar estratègies de control del tabaquisme als hospitals mitjançant la promoció de diverses activitats com ara: a) la implementació de programes per deixar de fumar per a pacients hospitalitzats i personal de l'hospital, b) millorar la formació del personal hospitalari en intervencions clíniques per deixar de fumar, c) donar suport i promoure el bon compliment de les normatives d'espais lliures de fum, d) avaluar sistemàticament el progrés dels hospitals en el control del tabaquisme, i e) la promoció d'altres activitats dins del control del tabaquisme (36). Al 2014, 70 hospitals formen part de la XCHsF, que representen el 87% de tots els hospitals públics i privats que ofereixen un servei públic a Catalunya.

1.2. El tabaquisme en l'àmbit de la salut mental

1.2.1. Prevalença dels trastorns mentals i impacte en el sistema sanitari i econòmic

Al voltant d'un quart de la població pot experimentar alguna forma de trastorn mental en un any; les formes més comunes són la depressió o ansietat lleus i autolimitades (37). En una metanàlisi de 174 estudis d'enquestes a 64 països diferents es va observar que el 17,6% dels enquestats complien criteris per algun trastorn mental en l'últim any i el 29,2% en algun moment de la seva vida (38).

L'OMS ha advertit que els trastorns mentals es troben entre les principals causes de discapacitat (39) i situa la depressió com el trastorn més incapacitant, en anys viscuts amb discapacitat ajustats per anys de vida (disability-adjusted life years, DALYs) (40).

L'esquizofrènia, la depressió, l'epilèpsia, la demència, la dependència de l'alcohol i altres trastorns mentals, neurològics i per ús de substàncies constitueixen el 13% de la càrrega mundial de malaltia (41), superant tant la malaltia cardiovascular com el càncer (42).

Els trastorns depressius representen el 40,5% de DALYs causats pels trastorns mentals i d'abús de substàncies; els trastorns d'ansietat representen el 14,6%; els trastorns per consum de drogues il·lícites el 10,9%; els trastorns per consum d'alcohol el 9,6%; l'esquizofrènia el 7,4%; el trastorn bipolar el 7,0%; els trastorns generalitzats del desenvolupament el 4,2%; els trastorns de conducta infantils el 3,4%; i els trastorns de la conducta alimentària el 1,2% (43). Aquestes dades suposen un desafiament pels sistemes de salut per la seva magnitud, motiu pel qual la prevenció i el tractament dels trastorns mentals hauria de representar una prioritat en salut pública.

Segons un informe realitzat pel Fòrum Econòmic Mundial juntament amb la Facultat de Salut Pública de Harvard, les malalties cròniques no transmissibles (càncer, diabetis, trastorns cardiovasculars, malalties respiratòries i trastorns mentals) s'han convertit en la principal amenaça econòmica per a la salut pública. Els trastorns mentals ocupen el primer lloc en càrrega econòmica de les malalties cròniques més freqüents. S'estima que el cost econòmic associat als trastorns mentals i neurològics tindrà un augment progressiu fins als 16,1 bilions de dòlars a l'any 2030, l'equivalent al 1,3% del PIB mundial (44). Aquesta dada pot tenir un impacte crític en l'economia global i en els sistemes sanitaris. S'ha de tenir en compte a més que les persones amb trastorns mentals presenten una probabilitat major de desenvolupar la resta de patologies cròniques, majors taxes de conductes de risc i a la vegada menors taxes de tractament i pobre adherència terapèutica (45). D'altra banda, els trastorns mentals, especialment l'ansietat

i la depressió, poden comprometre la productivitat de les empreses tenint en compte les xifres d'absentisme i baixes laborals que suposen. Per tots aquests aspectes que incideixen sobre els sistemes sanitaris i econòmics, des del Fòrum Econòmic Mundial es demanà la promoció d'estratègies de prevenció, aportació de recursos i un creixement en les polítiques de salut mental.

1.2.2. Pacients amb trastorns mentals: prevalença i característiques del consum de tabac

En els països desenvolupats el creixent coneixement dels efectes nocius del tabac i l'aplicació de polítiques eficaces de control del tabaquisme han contribuït a un descens progressiu de la prevalença de tabaquisme en la població general. No obstant, algunes poblacions especials, com la de les persones amb trastorns mentals, no estan seguint aquesta tendència (13).

Grans estudis poblacionals han trobat una major prevalença de tabaquisme en les persones afectades per trastorns mentals en comparació amb la població general (46,47). Se sap que la prevalença de tabaquisme augmenta a mesura que augmenta la gravetat del trastorn mental o el nombre de trastorns mentals en el decurs de la vida (46). A més, la gravetat del consum de tabac (en nombre de cigarretes per dia) és més alta a mesura que la gravetat del trastorn mental augmenta (37). En conseqüència, la prevalença de tabaquisme és significativament més elevada en el cas de pacients hospitalitzats en dispositius d'aguts de salut mental o en unitats de desintoxicació. En aquests dispositius la prevalença pot elevar-se fins a un 80% (48,49). La causa d'aquesta alta prevalença de consum de tabac no queda clara i podrien estar involucrats diversos factors. Entre ells, s'ha descrit la hipòtesi de l'automedicació, un origen genètic comú, i el baix nivell socioeconòmic (50).

La persistència de l'alta prevalença de tabaquisme pot reflectir un fracàs de la salut pública i els serveis sanitaris per atendre les necessitats d'aquest sector tan desfavorit de la societat (51). De fet, el tabac s'ha integrat històricament com un hàbit normal en la cultura dels centres de salut mental i els seus professionals. El tabaquisme ha estat en general un tema descuidat en els entorns d'atenció a la salut mental o vist com una addicció menor en els dispositius de desintoxicació.

1.2.3. Impacte del tabaquisme en els pacients amb trastorns mentals

L'elevada prevalença i dependència del tabac en els pacients amb trastorns mentals té com a conseqüència que tinguin una morbiditat i mortalitat degudes al consum de tabac també més altes que la població general. L'esperança de vida per a les persones amb trastorns mentals greus pot disminuir de 25 a 30 anys en comparació amb la població general (52-54), principalment a causa de malalties causades o agreujades pel tabac (per exemple, malalties cardiovasculars, pulmonars i diabetis). Així, en comparació amb la població general, els pacients amb trastorns mentals greus tenen dues vegades més risc de patir malaltia coronària (55) i més de tres vegades més risc de tenir MPOC (56). D'altra banda, el risc de càncer de laringe i d'esòfag es multiplica dràsticament quan les persones amb dependència de l'alcohol també fumen (57).

En el Pla d'Acció 2008-2013 de l'OMS per a la Prevenció i el Control de les malalties no contagioses (39) es varen exposar una sèrie de recomanacions per a la prevenció de les malalties cròniques, entre les qual hi havia la cessació tabàquica.

A Catalunya, el Pla de Salut de Catalunya 2011-2015, centrat en l'abordatge de les malalties cròniques, estableix objectius de salut i de disminució del risc per problemes de salut prioritzats, com ara els trastorns mentals. L'objectiu específic per aquest àmbit

és el de reduir la mortalitat de les persones amb trastorns mentals en un 10% d'aquí a l'any 2020. L'interès per promoure projectes de cessació tabàquica en pacients amb trastorns mentals s'emmarca en el desplegament del projecte 2.2 del pilar de Cronicitat del Pla de Salut 2012-2015 (58). D'altra banda, el Pla Interdepartamental de Salut Pública (PINSAP) (59) planteja diversos reptes principals, un d'ells la salut mental i les addiccions, promovent la salut mental i reduint l'impacte de les addiccions. Així, en les línies d'actuació en marxa que s'engloben dins el PINSAP s'inclou el pla integral d'atenció a les persones amb trastorn mental i addiccions, que se centra en la millora de la salut mental i disminució de les desigualtats socials en aquesta població.

1.2.4. El control del tabaquisme en l'àmbit de la salut mental hospitalària

Els pacients amb trastorns mentals tenen menys probabilitats de rebre assessorament per deixar de fumar que els pacients sense trastorns mentals (60). Més específicament, els professionals de la salut mental intervenen poc freqüentment en el tabaquisme dels seus pacients (61); això és especialment rellevant en els professionals que treballen a les unitats d'hospitalització (62).

Hi ha diverses creences relacionades amb el tabaquisme i els trastorns mentals instal·lades entre els professionals de salut mental (63): a) els pacients amb trastorns mentals no estan motivats per deixar de fumar, b) no són capaços de deixar de fumar, c) deixar de fumar pot posar en perill el curs del trastorn mental, d) deixar de fumar pot posar en perill el tractament d'una altra dependència de substàncies. No obstant, la literatura científica ha mostrat àmpliament evidències contràries a aquestes creences que poden ser, doncs, considerades com a mites (64-66).

Els professionals de la salut mental, i els sistemes de salut mental en general, normalment han estat reticents a aplicar normatives de prohibició total de fumar en els dispositius de salut mental, és a dir, aquelles normatives que no permeten fumar ni en interiors ni en exteriors, incloent-hi els recintes hospitalaris (20,61,67). Mentre que les polítiques lliures de fum als espais públics i llocs de treball en general (entre ells els hospitals i recintes hospitalaris) s'han estès per molts països, en general els dispositius de salut mental han quedat exempts de l'aplicació d'aquestes normatives (20,21). Les pors habituals dels professionals enfront de l'aplicació d'aquestes prohibicions totals de fumar tenen a veure amb un potencial augment de problemes en la conducta dels pacients, una major necessitat d'aïllament i contenció de pacients i altes voluntàries en contra de l'opinió mèdica. Molts estudis han trobat que el suport a aquestes prohibicions totals s'incrementa després de la seva posada en pràctica i que totes les situacions temudes no apareixen en una major freqüència que l'habitual (64,68).

El canvi en la motivació dels professionals per posar en pràctica les estratègies de control del tabaquisme és lent i requereix de temps. En general, és necessari augmentar els aspectes relacionats amb el control del tabaquisme a l'agenda de salut mental. Cal una estratègia ben definida per desenvolupar un canvi de prioritats en la intervenció sobre aquests pacients.

1.3. Justificació de la investigació

L'interès pel problema del tabaquisme en l'àmbit de la salut mental és encara recent i encara existeixen reticències i dubtes en els professionals de la salut mental a l'hora d'aplicar estratègies de control del tabaquisme als dispositius de salut mental (vegeu

annex 1). Així mateix, el tabaquisme encara és considerat un problema "menor" en els pacients que ingressen amb trastorns mentals greus o per una altra addicció. Aquesta situació es constata tant a l'àmbit nacional com internacional.

Els estudis que formen aquesta tesi pretenen avaluar el control del tabaquisme en l'àmbit de la salut mental a Catalunya, així com aprofundir en aspectes relacionats amb el fum ambiental del tabac en aquest àmbit, pel qual no hi ha o són escasses les dades a nivell nacional o internacional.

A Catalunya no hi ha dades àmplies sobre el nivell d'implementació de polítiques de control del tabaquisme en l'àmbit de la salut mental. Conèixer aquest nivell d'implementació i detectar les àrees de més necessitat d'actuació són essencials per iniciar qualsevol estratègia de millora.

Un aspecte important dins les estratègies de control del tabaquisme és la implementació de polítiques de prohibició total (sense excepcions) de fumar en els dispositius de salut mental de la mateixa manera que s'implementen a la resta de dispositius hospitalaris. Malgrat això, no existeixen dades sobre la magnitud del problema o nivell d'exposició al fum ambiental del tabac segons les diferents normatives permeses en diferents països. Amb aquests estudis també es busca conèixer l'opinió de treballadors i pacients respecte als diferents tipus de normatives, ja que no hi ha informació a Catalunya sobre aquestes preferències i percepcions. Així mateix es pretén aportar més dades dins un tema emergent pel qual hi ha poca però creixent evidència, com és l'efecte del fum ambiental en el malestar psicològic.

Tots aquests estudis proposats en aquesta tesi són part d'una àmplia estratègia per millorar el control del tabaquisme en l'àmbit de la salut mental hospitalària a Catalunya

(vegeu annex 2). Aquesta estratègia es desenvolupa dins la Xarxa Catalana d'Hospitals sense Fum a través del seu grup de treball de "Tabac i Salut Mental", que aplega en aquests moments (abril 2014) 26 professionals de la salut mental hospitalària (infermeres, psiquiatres i psicòlegs) de 18 hospitals diferents. Així doncs, aquesta recerca va unida a un treball pràctic de desenvolupament de materials i activitats paral·leles destinats als hospitals catalans que s'han recopilat també en aquesta tesi (vegeu annex, 2, 3, 4 i 5).

2. HIPÒTESIS I OBJECTIUS

2.1. Hipòtesis

1. Els dispositius hospitalaris i centres de dia de salut mental de Catalunya presenten uns nivells baixos de control del tabaquisme en quatre dimensions: a) el control del consum de tabac als espais sanitaris, b) la intervenció clínica sobre el consum de tabac, c) la formació dels professionals i d) la comunicació i promoció de normatives i estratègies pel control del tabaquisme.

2. Els dispositius de salut mental sense normatives de prohibició del consum de tabac o amb normatives parcials (aquelles en les que es permet fumar només als exteriors o en cambres especials interiors) presenten concentracions de material particulat de petit diàmetre ($PM_{2.5}$, com a marcador del fum ambiental del tabac) superiors als obtinguts en els dispositius amb normatives de prohibició total de fumar (tant en interiors com en exteriors).

3. En els dispositius amb nivells més elevats de $PM_{2.5}$, tant els pacients com els treballadors tenen una percepció d'exposició al fum ambiental del tabac més elevada, i en conseqüència, una major percepció d'ambient perjudicial per a la salut, mesurat mitjançant qüestionaris autoadministrats.

4. L'exposició autoreportada al fum ambiental del tabac a les llars té efectes negatius en el malestar psicològic de la població adulta no fumadora mesurat mitjançant el General Health Questionnaire (GHQ-12).

2.2. Objectius

1. Examinar les estratègies de control del tabaquisme implementades als dispositius d'hospitalització i centres de dia en salut mental de Catalunya i identificar àrees de millora.

2. Avaluar el nivell de fum ambiental del tabac en els dispositius de salut mental hospitalària de Catalunya segons el tipus de normativa de control del consum de tabac, utilitzant les $PM_{2.5}$ com a marcador del fum ambiental del tabac.

3. Comparar la percepció de nivell d'exposició al fum ambiental del tabac per part de treballadors i pacients amb els resultats obtinguts mitjançant la mesura objectiva de $PM_{2.5}$ i descriure la preferència per les diferents normatives de control del consum de tabac.

4. Avaluar la possible associació entre malestar psicològic i exposició al fum ambiental del tabac en la població adulta espanyola.

3. RESUM DELS ARTICLES

Aquesta tesi doctoral està composta de quatre treballs, dos articles originals publicats i dos enviats per publicar. A més, s'inclouen dos articles o assaigs més, un publicat i l'altre enviat a publicar. Tots aquests treballs s'emmarquen en la recerca de les estratègies i polítiques de control del tabaquisme i fum ambiental del tabac en l'àmbit de la salut mental. Els articles són els següents:

1) Article 1: Smoke-free policies in psychiatric services: identification of unmet needs.

Montse Ballbè, Gemma Nieva, Sílvia Mondon, Cristina Pinet, Eugeni Bruguera, Esteve Saltó, Esteve Fernández, Antoni Gual, Grup de treball de Tabac i Salut Mental.

Tobacco Control; 2012; 21(6):549-54.

Tobacco Control està inclosa en el Journal Citation Report de ISI-Web of Knowledge amb un factor d'impacte al 2012 de 4,111 (posició 12/161 a la categoria Public, Environmental & Occupational Health).

2) Article 2: Second-hand smoke in mental healthcare settings: time to implement total smoke-free bans?

Montse Ballbè, Xisca Sureda, Jose M. Martínez-Sánchez, Esteve Saltó, Antoni Gual, Esteve Fernández.

International Journal of Epidemiology; 2013; 42(3):886-893.

International Journal of Epidemiology està inclosa en el Journal Citation Report de ISI-Web of Knowledge amb un factor d'impacte al 2012 de 6,982 (posició 3/161 a la categoria Public, Environmental & Occupational Health).

3) Article 3: Second-hand smoke in psychiatric units: patient and staff misperceptions.

Montse Ballbè, Xisca Sureda, Jose M. Martínez-Sánchez, Marcela Fu, Esteve Saltó, Antoni Gual, Esteve Fernández.

Article actualment en procés de decisió per part de revisors externs a una revista del primer quartil dins la categoria Public, Environmental & Occupational Health.

4) Article 4: Association of second-hand smoke exposure at home with psychological distress in the Spanish adult population.

Montse Ballbè, Jose M. Martínez-Sánchez, Antoni Gual, Cristina Martínez, Marcela Fu, Xisca Sureda, Alicia Padrón-Monedero, Iñaki Galán, Esteve Fernández.

Article actualment enviat a una revista de segon quartil dins la categoria Public, Environmental & Occupational Health i Substance Abuse.

També s'adjunten a l'annex dos articles de reflexió o assaig dins la mateixa línia temàtica:

1) Por el humo se sabe dónde está el fuego. El abordaje del tabaquismo en los servicios de Salud Mental y Adicciones.

Antoni Gual, Montse Ballbè.

Opiniones en psiquiatria; 2011; 2: 31-34.

2) Deconstructing myths, building alliances: A networking model to enhance tobacco control in hospital mental health settings.

Montse Ballbè, Antoni Gual, Gemma Nieva, Esteve Saltó, Esteve Fernández, and the Smoking and Mental Health Working Group.

Article actualment enviat a una revista del primer quartil.

Fruit d'aquesta línia de treball i com a resultat de les necessitats detectades a partir dels articles que formen part de la tesi, s'adjunten a l'annex el resum de les guies en què la doctoranda ha participat com a coordinadora i com a coautora dins del grup de treball de *Tabac i Salut Mental* de la Xarxa Catalana d'Hospitals sense Fum:

1) Tabac i Salut Mental: Guia de bona pràctica hospitalària.

Edita: Grup de treball de Salut Mental i Tabac, Xarxa Catalana d'Hospitals sense Fum. Institut Català d'Oncologia. Departament de Salut de la Generalitat de Catalunya; 2009.

2) Guia d'intervenció clínica en el consum de tabac en pacients amb trastorn mental.

Edita: Grup de treball de Salut Mental i Tabac, Xarxa Catalana d'Hospitals sense Fum. Institut Català d'Oncologia. Agència de Salut Pública de Catalunya, Generalitat de Catalunya; 2012.

3) Guia d’actuació en pacients fumadors ingressats en unitats de salut mental.

Edita: Grup de treball de Salut Mental i Tabac, Xarxa Catalana d'Hospitals sense Fum. Institut Català d’Oncologia. Agència de Salut Pública de Catalunya, Generalitat de Catalunya; 2013.

Article 1: Smoke-free policies in psychiatric services: identification of unmet needs.

Montse Ballbè, Gemma Nieva, Sílvia Mondon, Cristina Pinet, Eugeni Bruguera, Esteve Saltó, Esteve Fernández, Antoni Gual i Grup de treball de Tabac i Salut Mental.

Tobacco Control; 2012; 21(6):549-54.

Correspon a l'objectiu número u d'aquesta tesi.

Objectiu: Examinar el nivell d'implementació d'estratègies de control del tabaquisme als dispositius hospitalaris i centres de dia de salut mental de Catalunya.

Mètodes: Estudi transversal que incloïa tots els dispositius de salut mental que ofereixen serveis públics a Catalunya (n=192). Els caps de dispositiu van respondre a un qüestionari de 24 ítems que cobria quatre dimensions: intervenció clínica sobre el consum de tabac, formació i compromís dels professionals, control dels espais on es permet/prohibeix fumar i comunicació de les normatives sense fum.

Resultats: Al qüestionari van respondre 186 caps de dispositiu (taxa de resposta del 96,9%) entre desembre del 2008 i març del 2009. Els resultats van mostrar nivells baixos de control de tabaquisme: en el 53,0% dels dispositius s'identificava el consum de tabac en el pla de tractament individualitzat, en el 41,0% es realitzava intervenció sobre el consum de tabac dels pacients i en el 34,1% tenien disponible farmacoteràpia per deixar de fumar. Dels 186 caps que van respondre el qüestionari, el 47,3% va afirmar que el personal del seu dispositiu tenia un coneixement insuficient sobre les intervencions per deixar de fumar.

El 38,9% dels dispositius tenien zones per a pacients fumadors a l'interior i el 87,1% tenien normatives escrites sobre els espais lliures de fum. El 59,9% demanava l'opinió al personal sobre aquestes normatives.

Els centres de dia van mostrar l'execució més baixa en les mesures de control del tabac ($p=0,005$) respecte als altres tipus de dispositiu. Pel conjunt de tots els ítems, els dispositius d'hospitals membres de la Xarxa Catalana d'Hospitals sense Fum van obtenir resultats més elevats que els hospitals no membres ($p<0,01$).

Conclusió: El control del tabaquisme en els dispositius de salut mental durant l'anterior llei espanyola sobre tabaquisme (llei 28/2005) és insuficient. El marge de millora en les polítiques de control del tabac se centra especialment en les intervencions a fumadors, la formació de professionals i la disponibilitat de recursos.

Article 2: Second-hand smoke in mental healthcare settings: time to implement total smoke-free bans?

Montse Ballbè, Xisca Sureda, Jose M. Martínez-Sánchez, Esteve Saltó, Antoni Gual i Esteve Fernández.

International Journal of Epidemiology; 2013; 42(3):886-893.

Correspon a l'objectiu números dos d'aquesta tesi.

Objectiu: Avaluar objectivament els nivells de fum ambiental del tabac als dispositius de salut mental hospitalària segons el tipus de normativa de control d'espais lliures de fum.

Mètodes: Es va realitzar un estudi transversal per avaluar el fum ambiental del tabac (FAT) en 64 unitats d'hospitalització de salut mental (95,5% de les totes les unitats) a Catalunya. Es va mesurar la concentració de $PM_{2.5}$ com a marcador del FAT en cada unitat entre novembre de 2010 i març de 2011.

Resultats: Mentre l'OMS recomana uns nivells màxims de $PM_{2.5}$ de 10 µg/m^3, la mitjana geomètrica (interval de confiança del 95%) de la concentració de $PM_{2.5}$ a les unitats amb prohibició total de fumar (tant en interiors com en exteriors) va ser de 8,81 µg/m^3 (8,06-9,56 µg/m^3), 13,80 µg/m3 (13,23-14,36 µg/m^3) en les unitats on no es permetia fumar als interiors però sí als exteriors, 24,29 µg/m^3 (23,50-25,03 µg/m^3) en unitats amb sales interiors per fumar, i 51,00 µg/m^3 (49,83-52,04 µg/m^3) en unitats que permetien fumar en àrees interiors comunes ($p<0,05$). El model de regressió ajustat per diferents variables de confusió va mostrar un augment lineal de $PM_{2.5}$ conforme el nivell de restricció de la normativa era menor. Finalment, la concentració de $PM_{2.5}$ a les sales interiors de fumadors era de 286,50 µg/m^3 (283,95-288,89 µg/m^3).

Conclusió: Només les unitats amb prohibició total de fumar en els interiors i els exteriors tenien nivells de $PM_{2.5}$ per sota dels nivells recomanats per l'OMS de 10 $\mu g/m^3$. Les unitats amb normatives més permissives tenien nivells de $PM_{2.5}$ amb efectes perjudicials per a la salut.

Article 3: Second-hand smoke in psychiatric units: patient and staff misperceptions.

Montse Ballbè, Xisca Sureda, Jose M. Martínez-Sánchez, Marcela Fu, Esteve Saltó, Antoni Gual i Esteve Fernández.

Article actualment en procés de decisió per part de l'editor després de la resposta als comentaris de revisors externs, enviat a una revista de primer quartil dins la categoria Public, Environmental & Occupational Health.

Correspon a l'objectiu números tres d'aquesta tesi.

Objectiu: Comparar el nivell de fum ambiental del tabac (FAT) als dispositius de salut mental hospitalària autoreportat a través de qüestionaris per part dels pacients i professionals enfront a les mesures objectives de $PM_{2.5}$. També s'explorà la preferència dels pacients i dels professionals per diferents tipus de normatives de control dels espais lliures de fum.

Mètodes: Estudi transversal sobre les preferències per diferents tipus de normatives de prohibició de fumar i la percepció d'exposició al FAT per mitjà d'un qüestionari administrat als pacients i el personal de 65 unitats d'hospitalització psiquiàtrica a Catalunya (95,5% de totes les unitats). En aquestes unitats també es va mesurar la concentració de $PM_{2.5}$ com a marcador del FAT.

Resultats: Es van entrevistar 600 pacients i 575 professionals entre desembre del 2008 i març del 2009. Segons les dades de $PM_{2.5}$ un 78,7% dels pacients i professionals en conjunt estaven objectivament exposats al FAT als seus dispositius hospitalaris per sobre dels límits recomanats per l'OMS ($PM_{2.5}$>10μg/m^3). Malgrat això, de la mostra d'aquests pacients i professionals exposats un 56,9% dels pacients i un 33,6% dels

professionals deien no estar exposats en absolut al FAT i conseqüentment, un 41,6% de pacients i un 28,4% de professionals pensaven que l'ambient del seu dispositiu no era en absolut perjudicial per a la seva salut.

Tot i que el personal d'infermeria mostrava una prevalença de consum de tabac superior als metges (35,8% vs. 17,2% respectivament), tenia una major percepció d'estar moderadament o molt exposades al FAT que els metges (40,3% vs. 26,2%; $p<0,001$). Finalment, només un 14,1% dels pacients i un 29,3% dels professionals estaven molt d'acord o totalment d'acord amb les normatives que prohibeixen als pacients fumar tant als interiors com als exteriors. En canvi, un 49,2% dels pacients i un 59,7% dels professionals estaven a favor de permetre fumar als pacients als exteriors però no als interiors dels dispositius.

Conclusions: Tant els pacients com els professionals tenen una percepció errònia sobre en seu nivell d'exposició al FAT i per tant, són poc conscients de l'ambient perjudicial de la unitat en la que estan ingressats o treballen. Això podria tenir certa influència en la preferència per les normatives de prohibició de fumar menys restrictives.

Article 4: Association of second-hand smoke exposure at home with psychological distress in the Spanish adult population.

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Article actualment enviat a una revista de segon quartil dins la categoria Public, Environmental & Occupational Health i Substance Abuse.

Objectiu: Avaluar l'associació entre l'exposició al fum ambiental del tabac (FAT) i el malestar psicològic en una mostra representativa de la població espanyola.

Mètodes: En va realitzar un estudi transversal utilitzant les dades de la Encuesta Nacional de Salud de España (ENSE, 2011-2012) per a població adulta sobre l'exposició a FAT, variables sociodemogràfiques i de salut, i sobre el malestar psicològic mesurat amb el qüestionari *General Health Questionnaire* de Golberg (GHQ-12) (punt de tall ≥3). De la mostra total (n=21.007), es va utilitzar la submostra dels no fumadors (n=11.214) per tal d'evitar possibles efectes actuals o residuals de fumar sobre el malestar psicològic. Es va calcular la odds ratio i l'intèrval de confiança del 95% pel GHQ≥3 mitjançant models de regressió logística múltiple incondicionals ajustats per edat i sexe.

Resultats: El 9,7% de la mostra estava exposada al FAT a les seves llars. En la mostra de persones exposades al FAT, la prevalença de puntuacions de GHQ≥3 era més alta que en les persones no exposades al FAT (18,9% vs. 22,7%; OR: 1,39; IC: 1,19-1,62). Aquesta major prevalença es mantenia després d'estratificar per sexe, edat, estat civil, nivell sòcio-econòmic, estat de salut percebut, presència d'alguna malaltia crònica i ingesta d'alcohol.

Conclusió: L'exposició al FAT pot tenir un impacte en el malestar psicològic. És important dissenyar i implementar intervencions adreçades a evitar l'exposició al FAT a les llars.

4. PUBLICACIONS

Smoke-free policies in psychiatric services: identification of unmet needs.

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Smoke-free policies in psychiatric services: identification of unmet needs

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ABSTRACT

Introduction Smoke-free policies have been extended to enclosed workplaces in many countries; however, smoking continues to be commonly allowed on psychiatric premises. The aim of this study was to describe tobacco control strategies undertaken in psychiatric inpatient services and day centres in Spain.

Methods This cross-sectional survey included all psychiatric service centres that offered public services in Catalonia, Spain (n=192). Managers responded to a questionnaire of 24 items that covered four dimensions, including clinical intervention, staff training and commitment, smoking area management and communication of smoke-free policies.

Results A total of 186 managers (96.9%) completed the questionnaire. Results showed low tobacco control in psychiatric services: 41.0% usually intervened in patient tobacco use, 34.1% had interventional pharmacotherapy available and 38.9% had indoor smoking areas. Day centres showed the lowest implementation of tobacco control measures. Out of 186 managers, 47.3% stated that the staff had insufficient knowledge on smoking cessation interventions.

Conclusions The former Spanish partial law has not been sufficiently successful in promoting tobacco control in psychiatric services. There is room for improvement in tobacco control policies, specifically in smoking interventions, staff training and resource availability.

INTRODUCTION

In individuals with mental disorders, smoking prevalence is twice that of the general population.[1 2] This high prevalence is typically accompanied by high nicotine dependence, and it leads to elevated rates of morbidity and mortality. Individuals with severe mental illnesses die approximately 25–30 years earlier than expected for the general population, often by conditions usually caused or exacerbated by smoking.[3 4]

Interventions against tobacco use have proven to be feasible in mental health and addiction inpatient settings, where smoking prevalence may reach 70%–90%.[5–7] Several studies have shown that a significant percentage of patients are, in fact, motivated to quit[8 9] and that they can succeed in quitting smoking.[3 10] However, individuals with mental illnesses or addictions have lower cessation rates compared with the general population.[1] When applied consistently, total bans on smoking in psychiatric settings, though controversial, have been effective in protecting others from second-hand smoke.[11] Moreover, despite the problems typically anticipated by the staff,[12] total bans on smoking have not caused significant increases in the frequency or intensity of disruptive behaviours among psychiatric inpatients.[13–15]

In Spain, the former smoking regulation (Law 28/2005),[16] which was in force until December 2010, banned smoking in indoor public places and workplaces, including hospitals. However, the law exempted psychiatric services, where indoor smoking rooms were permitted 'if deemed necessary'. The new law (Law 42/2010, which came into force on 2 January 2011) has extended the ban to outdoor hospital campuses, and it also banned smoking areas (either indoor or outdoor) in short-stay psychiatric units. However, smoking rooms continue to be allowed in medium- and long-stay psychiatric units.[17] In Catalonia (Spain), the Catalan Network of Smoke-free Hospitals, founded in 1999, recommends that its affiliates ban smoking without exemptions. To join the Network, hospitals must commit to a progressive implementation of tobacco control strategies with the support of the Network. The Catalan Network of Smoke-free Hospitals currently comprises 64 hospitals (90% of all public hospitals), including general hospitals with or without psychiatric services or psychiatric wards. The Network's mission is to promote progressive tobacco-free strategies in hospitals through several activities, as previously described.[18 19]

Very few studies have been conducted at the regional or national level to evaluate the implementation of smoking policies in psychiatric institutions.[20 21] The aims of the present study were to examine tobacco control strategies undertaken in psychiatric inpatient institutions in Catalonia (Spain) and to examine unmet needs that resulted from the partial ban on smoking in Spain.

METHODS

Setting and participants

A cross-sectional survey was conducted from December 2008 to March 2009. The survey target population was clinical managers directly in charge of psychiatric units. We included inpatient units and day centres used by psychiatric services in Catalonia (Spain). Specifically, these included Acute Services, Subacute Services, Medium- and Long-Stay Services, Detoxification Services, Dual Disorders Services (addictive disorders concurrent with other mental health disorders), Day Hospitals, Day Centres and Child and Adolescent Services. Nearly half (51.6%) of the in-hospital services were affiliated with the Catalan Network of Smoke-free

Hospitals. Catalonia is one of 17 autonomous regions of Spain, located in the north-eastern part of the country. It has 7.5 million inhabitants, nearly 16% of the total Spanish population. Spain has a unique national health system, with decentralised management organised by the autonomous regions. The smoke-free policies and regulations are nationally applicable, without exception among autonomous regions.

Study instrument

The self-audit questionnaire developed by the European Network of Smoke-free Hospitals (ENSH)[22] was adapted to fit mental health services. The questionnaire was adapted through review and consensus of the 'Smoking and Mental Health' working group of the Catalan Network of Smoke-free Hospitals. This working group comprised 29 health professionals from 18 different mental health centres and hospitals in Catalonia. The survey was based on the ENSH standards for good tobacco control management in hospital settings.[22]

First, the questionnaire collected structured information on the characteristics of each institution, in terms of: (1) types of patients admitted (ie, acute, subacute, day hospital, etc), (2) total number of admissions per year, (3) age of patients (child, adolescent or adult) and (4) financial funding (public or semi-private). Second, the questionnaire explored the implementation of tobacco control policies in four dimensions: smoking intervention (six items), staff training and commitment (four items), management of smoking areas (eight items) and communication of smoke-free policies (six items); (table 1). The total score ranged from 0 to 96; high scores indicated high implementation of smoke-free policies.

The survey also included seven items that asked about situations related to the violation of smoke-free policies in the service and about tobacco availability inside the healthcare facility. The responses to all questions were Likert-type (always, often, sometimes, rarely, never).

Procedure

A complete list of public and private centres that offered public psychiatric services was obtained from the Health Department of the Catalan Government. The list included every hospital service and day centre that offered psychiatric services in Catalonia (n=192). An email was sent to all managers (directly in charge of the unit) explaining the overall goal of the survey, and it included a link to an internet-based questionnaire. Emails were sent in December 2008, and up to five reminders were sent afterwards, either by telephone or by emails. Survey responses were collected from December 2008 to March 2009.

Data analysis

Services were divided into six groups: Acute Services, Subacute Services and Medium- and Long-Stay Services, Detoxification Services and Dual Disorders Services, Day Hospitals, Day Centres and Child and Adolescent Services (under 18 years old).

For descriptive analyses, response categories for every item were collapsed from five ('always', 'often', 'sometimes', 'rarely', 'never') to three ('always/often', 'sometimes', 'rarely/never'). All scores were based on an ordinal scale and they did not follow a normal distribution; therefore, we evaluated median scores. The Friedman test was used to compare 'types of service'; the Wilcoxon test was used to compare 'affiliations to the Catalan Network of Smoke-free Hospitals'. Median analyses and Wilcoxon tests included five response categories (maximum score was 4 for 'always' and minimum score was 0 for 'never'). The four dimensions of the ENSH standards list (24 items = total maximum score: 96) included clinical intervention (maximum score: 24), staff training and commitment (maximum score: 16), management of smoking areas (maximum score: 32) and communication of the smoke-free policies (maximum score: 24). All analyses were carried out with the SPSS V.16.0 Statistical Package (SPSS Inc.). A p value <0.05 was considered significant.

RESULTS

Of the 192 managers in existing psychiatric services, 186 submitted completed surveys (96.9%). Taken together, these services admitted 23 462 patients in 2008. Of the 186 responders, 59 (31.72%) were at public institutions and 127 (68.28%) were at private institutions that were publicly funded and offered services within the National Health System. Most managers (87.1%; n=162) stated that they had a written policy on the provision for a smoke-free environment.

Table 1 shows the results from the survey, categorised by the type of service and the affiliation to the Catalan Network of Smoke-free Hospitals.

In the *intervention dimension*, 41.0% of services offered some assistance for managing patient nicotine dependence. Only 34.1% of services had pharmacotherapy available for this purpose. In contrast, 31.9% of services provided tobacco products to patients on a regular basis (including three Child and Adolescent Services), but only 7.6% of these admitted that they used cigarettes frequently (always or often) as a reward, incentive or therapeutic tool.

In the *training and commitment dimension*, we observed that managers generally promoted awareness-raising strategies that targeted the staff (77.1%); however, information briefings about how to implement smoke-free policies and the availability of training sessions for clinical interventions were relatively scarce (27.5% and 37.9%, respectively). Consistent with that result, 47.3% of managers reported that their staff did not have sufficient knowledge on clinical smoking interventions.

With respect to the *areas dimension*, 38.9% of services had indoor smoking areas and 23.7% reported that indoor smoking areas were commonly used by both smokers and non-smokers (including four child and adolescent day hospitals). Incidents related to the management of smoking were commonly registered in only 33.9% of the services assessed.

With regard to the *communication dimension*, 93.4% of services often or always communicated changes regarding smoke-free policies to staff and patients. Nevertheless, only 59.9% of services commonly asked for the opinion of the staff. Moreover, only 27.9% of services shared experiences about the implementation of these policies with other institutions.

We found significant differences in the medians of the four explored dimensions according to the type of service (p=0.011; table 2). Day centres showed the lowest scores in all dimensions (p=0.005) except in the 'areas' dimension. No statistical differences were found among the types of service in the 'areas' dimension; however, in terms of smoke-free areas, Detoxification and Dual Disorders Services exhibited the lowest medians.

As indicated in table 3, services differed in their implementation of smoke-free policies, depending on their membership to the Catalan Network of Smoke-free Hospitals (p<0.01). Out of the 126 inpatient services surveyed, 64 belonged to the Network. We excluded day centres from these analyses because the Network included only hospital settings. Services that were members of the Network exhibited significantly higher scores than non-members in the dimensions of 'intervention' (p<0.01), 'training and commitment' (p<0.01) and 'communication'

Table 1 Percentage of services that responded 'always' or 'often' to survey items, according to the type of service or their affiliation to the Catalan Network of Smoke-free Hospitals

	Type of service						CNSfH*		
Dimension/item	A, n=25	SA/MLS, n=34	Dtx/DD, n=15	DH, n=30	DC, n=60	Ch/A, n=22	Member CNSfH, n=64	Non-member CNSfH, n=62	All, n=186
Smoking intervention									
1. Smoking was identified in the care plan	64.0	50.0	60.0	43.3	45.0	72.7	64.6	50.0	53.0
2. Smoking was recorded in the medical file	84.0	76.5	93.3	83.3	55.0	86.4	85.5	82.5	74.6
3. Smoking intervention was offered to patients	44.0	38.2	33.3	46.7	33.3	54.5	50.8	38.7	41.0
4. Smoking pharmacotherapy was available	48.0	38.2	46.7	36.7	11.7	54.5	57.4	32.8	34.1
5. Follow-up at discharge was provided	44.0	35.3	53.3	56.7	53.3	45.5	55.7	38.1	48.9
6. Smoking cessation help was available to staff	52.0	44.1	26.7	26.7	25.0	54.5	52.5	33.3	36.8
Staff training and commitment									
7. Managers promoted awareness-raising strategies targeting staff	88.0	74.9	66.7	82.8	64.8	90.9	88.5	76.6	77.1
8. Briefing sessions about smoking policies were available	32.0	38.2	26.7	20.0	15.0	45.5	49.2	18.3	27.5
9. Staff had specific knowledge on smoking intervention	64.0	55.9	53.3	53.3	40.0	59.1	79.0	37.7	52.7
10. Smoking intervention training was available to staff	44.0	35.3	33.3	50.0	23.3	54.5	55.7	33.3	37.9
Management of smoking areas									
11. Smoking was prohibited in common indoor areas	64.0	73.5	46.7	86.7	83.3	81.8	67.7	78.1	76.3
12. There were delimited outdoor smoking areas for patients	48.0	76.5	53.3	80.0	70.0	45.5	54.8	73.0	65.9
13. There were no indoor smoking areas for patients	36.0	97.1	46.7	66.7	70.0	90.9	53.2	60.3	61.1
14. There was clear signage indicating smoking and no-smoking areas	80.0	85.3	80.0	83.3	76.7	86.4	85.2	82.8	84.4
15. Staff exposure to SHS was minimised to a great extent	84.0	94.1	66.7	93.3	86.7	100	83.9	96.8	90.7
16. Staff only smoked in outdoor designated areas	96.0	100	80.0	100	88.3	95.5	98.3	96.9	96.7
17. Environmental audits were undertaken annually	16.0	20.6	20.0	16.7	8.3	22.7	29.7	28.3	15.9
18. Incidents on management of tobacco control were registered	36.0	55.9	33.3	30.0	18.3	40.9	47.2	47.3	33.9
Communication of smoke-free policies									
19. Changes in smoke-free policies were communicated to staff and patients	96.0	97.1	80.0	93.3	83.3	100	95.1	96.8	93.4
20. Patients were informed about the benefits of smoke-free policies	80.0	79.4	66.7	83.3	70.0	90.9	83.9	79.4	78.3
21. Patients were consulted about their difficulties in policies compliance	68.0	79.4	40.0	63.3	65.0	68.2	63.9	72.6	67.2
22. Staff members were consulted about their views on these policies	76.0	76.5	46.7	50.0	43.3	72.7	75.4	60.7	59.9
23. Staff was consulted about the barriers encountered to implementing a smoke-free policy	84.0	73.5	46.7	63.3	45.0	50.0	75.4	63.8	60.4
24. The organisation shared best practice on tobacco control	32.0	35.3	26.7	33.3	16.7	31.8	49.1	24.1	27.9

Items have been shortened in this table.
Values represent the percentage of 'always/often' responses versus 'sometimes' and 'rarely/never'.
*Day centres were excluded (n=60) because they were not allowed to be affiliated to the CNSfH.
A, Acute Service; Ch/A, Child/Adolescent Patients Service; CNSfH, Catalan Network of Smoke-free Hospitals; DC, Day Centre; DD, Dual Disorders Service; DH, Day Hospital; Dtx, Detoxification Service; MLS, Medium- and Long-Stay Service; SA, Subacute Service; SHS, secondhand smoke.

(p=0.005). Thus, compared with non-members, Network members exhibited a higher probability of offering support in managing patient smoking (50.8% vs 38.7%), providing pharmacotherapy (57.4% vs 32.8%), following up after discharge (55.7% vs 38.1%) and providing smoking cessation intervention for staff members (52.5% vs 33.3%). Also, Network members showed higher staff training levels in clinical tobacco interventions compared with non-members (79.0% vs 37.7%). There

Table 2 Median questionnaire scores according to dimension and type of psychiatric service

Dimensions	Range*	Median scores A, n=25	SA/MLS, n=34	Dtx/DD, n=15	DH, n=30	DC, n=60	Ch/A, n=22	All, n=186	p Value†
Smoking intervention	0–24	16.00	12.50	16.00	13.50	10.00	16.50	13.00	0.006
Staff training and commitment	0–16	10.00	10.50	10.00	9.00	8.00	11.00	9.00	0.032
Management of smoking areas	0–32	19.00	22.50	17.00	23.00	21.50	23.00	22.00	0.228
Communication of smoke-free policies	0–24	18.00	19.00	17.00	17.00	14.00	16.50	17.00	0.001
Total	0–96	63.00	61.00	60.00	60.00	54.00	66.00	59.00	0.011

*High scores indicate high implementation of tobacco control strategies.
†p Value for Friedman test.
A, Acute Service; Ch/A, Child/Adolescent Patients Service; DC, Day Centre; DD, Dual Disorders Service; DH, Day Hospital; Dtx, Detoxification Service; MLS, Medium- and Long-Stay Service; SA, Subacute Service.

were no statistical differences between Network members and non-members regarding the 'areas' dimension.

DISCUSSION

This study shows that smoking was managed at relatively low levels in the inpatient services and day centres explored, which represented nearly all the psychiatric services in a Spanish region with 7.5 million inhabitants. Health professionals did not routinely intervene in patient tobacco use (only 41% of services performed some kind of intervention).

Smoking cessation strategies are a critical component in the implementation of smoke-free policies.[23] Clinical interventions may have been limited, in part, due to the unavailability of pharmacotherapy in many of the services evaluated. Nicotine replacement therapy has proven to be a simple intervention with clinically significant implications in inpatient psychiatric services.[24] In Spain, however, the National Health System did not fund any pharmacological treatments approved for smoking cessation. This may have contributed to the low availability of these drugs in the services assessed. Furthermore, the lack of funding may indicate that these treatments are not perceived as a basic resource in these settings. It would also be interesting to follow-up smoking behaviour for longer periods after discharge.[25]

Of particular note was the low level of staff training. Only half of the services had sufficiently trained professionals for interventions in smoking. This percentage was the same as that found among Detoxification and Dual Disorders services, which typically placed little emphasis on smoking cessation,[26] potentially because tobacco was considered a minor addiction.[27] In Spain, current university curricula for medicine, psychology and nursing do not generally include specific training on smoking cessation.[28]

Low scores were observed in all four dimensions (intervention, training and commitment, areas and communication) for all types of services evaluated; but, generally, day centres showed the lowest scores. These services promoted psychosocial rehabilitation and personal healthcare. Patients admitted to these services were in a stable mental condition and typically remained in these units for long periods on a daily basis. Thus, this could be a critical opportunity for addressing tobacco use. However, our results showed that these centres have neglected to intervene in smoking, one of the most severe health problems of these patients. More effort should be made to improve training and intervention skills in these settings. Further research should clarify why tobacco control remains unaddressed in these centres.

The most concerning findings were that outdoor smoking areas existed in 45.5% of the services that treated patients under 18 years old, smoking was allowed in common indoor areas in 4-day hospitals and cigarettes were provided to patients on a regular basis in three services. Moreover, only 54.5% of all child and adolescent day hospitals offered some kind of smoking cessation intervention.

No significant differences were found in the management of smoke-free areas among the different types of services. The existence of indoor areas commonly used by smokers, non-smokers and staff indicated tolerance of an unhealthy environment. This practice must be corrected. Members of the Catalan Network of Smoke-free Hospitals (half of the services) showed significantly higher scores in intervention, training and commitment and communication. The Network provides resources specifically designed to assist hospitals control tobacco use, including training for professionals, a common tobacco cessation program for patients and professionals, free access to smoking cessation drugs, etc. In the mental health field, the Network published a guide in 2009 for best practices and recommendations,[29] based on a similar Irish guide,[30] to strengthen tobacco control activities in hospital mental health settings. Thus, psychiatric institutions would benefit from an affiliation to the Network.

Table 3 Median scores according to dimension and the affiliation to the Catalan Network of Smoke-free Hospitals

Dimensions	Range*	Median scores Members CNSfH, n=64	Non-members CNSfH, n=62	All, n=126	p Value†
Smoking intervention	0–24	17.00	12.00	14.00	<0.01
Staff training and commitment	0–16	11.00	9.00	10.00	<0.01
Management of smoking areas	0–32	22.50	22.50	22.50	0.801
Communication of smoke-free policies	0–24	18.50	17.00	18.00	0.005
Total	0–96	67.50	58.00	62.00	<0.01

Day centres were excluded.
*High scores indicate high implementation of tobacco control strategies.
†p Value for Wilcoxon test.
CNSfH, Catalan Network of Smoke-free Hospitals.

What this paper adds

- Very limited research has been conducted on the implementation of smoking policies in psychiatric services.
- Results revealed unmet needs and areas that require improvement, mainly staff training, smoking interventions and the availability of pharmacotherapy.
- Special efforts should be placed on day centres; our results showed that these settings had the lowest levels of tobacco control strategies, but they had the highest potential for success because patients had achieved a stable condition.

The Spanish regulation on smoking has changed since 2 January 2011 in order to address the ineffectiveness of the previous legislation.[17] The changes were primarily directed towards bars and restaurants, but the law was also modified for short-stay psychiatric services. Currently, Acute, Detoxification and Dual Disorders services must implement total smoking bans, both indoors and outdoors. To successfully apply the new law, these services must address the pitfalls identified in the current study. Future studies should re-evaluate the tobacco control strategies implemented in these services in response to this new law.

Few countries, states or territories have implemented total bans in smoking in psychiatric services[31] and not all have shown an overall positive outcome.[20] Even with complete implementation of a total ban, some concerns, similar to those found in this study, remain to be addressed. In particular, improvements are needed in the mode of intervention, availability of pharmacotherapy and education and training.[32 33] A similar study conducted in Australia also reported a low percentage of institutions that provided patient smoking interventions and staff intervention training.[21] Most studies were conducted in English-speaking countries.[20 21] Moreover, the published studies on single hospitals did not account for cultural, structural, political and environmental circumstances but typically assumed contextual uniformity.[32]

A potential limitation of the present study was the self-reported nature of the data. Service managers may be biased towards 'positive' results or over-reporting the virtues of the tobacco control policies implemented. For example, future studies should ascertain the validity of the question regarding the use of cigarettes as a reward. Thus, our data represent the best-case scenario, despite the low scores obtained. Future research should consider a formal validation of the self-completed questionnaire with an external audit. Also, we did not include private inpatient services that did not serve the National Health Service; however, these were scarce in the area studied (only three institutions with <30 beds each), and this exclusion was likely to have a nearly negligible impact. On the other hand, the high participation rate (96.9%) was a strength of the study, which included a comprehensive area.

In conclusion, this study revealed unmet needs and areas that require improvement in tobacco control within the psychiatric health services.[34] Approaches like those of the Catalan Network of Smoke-free Hospitals and changes in legislation could promote successful tobacco control in these settings. Patients with psychiatric illnesses deserve the same health protections as those with other types of illnesses.

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Competing interests None.

Contributors MB, ES, EF and AG designed the study. MB collected the data and performed statistical analyses. All the authors contributed to the interpretation of the study findings. MB drafted the manuscript and all the authors contributed to the revision of the manuscript for important intellectual content. All the authors and the other members of the Study Group approved the final version of the manuscript.

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Second-hand smoke in mental healthcare settings: time to implement total smoke-free bans?

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Background Second-hand smoke is associated with adverse health effects. Many countries have extended smoke-free policies to public buildings and workplaces such as hospitals, but mental health units have usually been exempted from complete smoke-free bans. The objective of this study was to evaluate second-hand smoke levels in mental health units with different types of smoking bans.

Method We conducted a cross-sectional study to evaluate second-hand smoke in 64 mental health inpatient units (95.5% of the all such units) in Catalonia, Spain. We measured air concentrations of particulate matter <2.5 μm ($PM_{2.5}$) as a marker of second-hand smoke in different locations at each unit.

Results The geometric mean (95% confidence interval) of the $PM_{2.5}$ concentration was 8.81 μg/m^3 (8.06–9.56) in units with indoor and outdoor smoking bans, 13.80 μg/m^3 (13.23–14.36) in units with indoor smoking bans that allowed smoking in outdoor areas, 24.29 μg/m^3 (23.50–25.03) in units with indoor smoking rooms and 51.00 μg/m^3 (49.83–52.04) in units that allowed smoking in common indoor areas ($P < 0.05$). The regression model adjusted for confounding variables showed a linear increase of $PM_{2.5}$. The $PM_{2.5}$ concentration in smoking rooms was 286.50 μg/m^3 (283.95–288.89).

Conclusions Only units with indoor and outdoor smoking bans had $PM_{2.5}$ levels below the standard recommended WHO levels of 10 μg/m^3. Units with more permissive smoking policies had $PM_{2.5}$ levels from second-hand smoke that have harmful health effects.

Keywords Tobacco smoke pollution, smoking, hospitals, mental health services, policy

Introduction

Second-hand smoke has several harmful health effects and has been associated with lung cancer, respiratory symptoms and cardiovascular diseases.[1,2] In many countries, this evidence has prompted the development of smoke-free policies in public spaces and workplaces, including hospitality venues, hospitals and hospital campuses.[1] Such bans have had beneficial consequences at a public health level, mainly on cardiovascular diseases and respiratory symptoms.[3,4] Despite the smoke-free policies legislated in some countries, residential healthcare centres and mental health units are usually exempted from implementing these policies.[5–7] Only a few countries have banned indoor smoking in psychiatric hospitals,[8,9] and this topic is still being debated.

People with mental illnesses have a higher prevalence of tobacco consumption than the general population and have more severe dependency as well.[10,11] The prevalence and severity of smoking increases as the severity of the mental illness increases,[10] with a smoking prevalence of up to 80% in patients admitted to inpatient units.[11] Patients with severe mental illness die 25–30 years earlier than the general population, mainly due to diseases that are caused or worsened by tobacco use.[12] Nevertheless, smoking cessation treatment is seldom provided or included in the general care plan of the patients.[8,13]

Moreover, mental health professionals are often reluctant to implement total indoor and outdoor smoking bans in mental health wards, usually preferring partial bans.[14,15] It is commonly argued that their patients lack the motivation to quit smoking and that it will be difficult for them to stop smoking. It is further hypothesized that total smoking bans could increase patient aggression, seclusion and the need for restraint, or could even lead them to discharge themselves against medical advice. It is also feared that total bans might compromise the course of the patient's mental health disorder or jeopardize abstinence from or treatment outcomes from dependence on other drugs. However, there is compelling scientific evidence showing that these consequences are unlikely to occur.[6,16–18] In fact, some studies indicate that partial smoking bans that allow smoking in designated places tend to cause more disruption than total smoking bans.[19]

Levels of exposure to second-hand smoke in different mental health units have never been assessed objectively, and few surveys have been conducted that ask the staff about their perceived exposure to second-hand smoke.[19] The goal of this study was to objectively evaluate the levels of second-hand smoke in psychiatric inpatient units according to the type of smoking ban.

Method

Study design and sampling procedure

We conducted a cross sectional study between November 2010 and March 2011. The target units for evaluation were all mental health inpatient units ($n=67$) that treated adult patients in Catalonia, Spain. Catalonia is located in the north-eastern part of Spain and has 7.5 million inhabitants. Of these 67 units, 16 were acute-patient units, 31 were subacute and medium- and long-stay patients units, 12 were detoxification or dual disorders units (the latest treating addictive disorders concurrent with other mental health disorders) and in the other 8 facilities two different types of units were present. These 67 units have a total of approximately 2300 beds, and more than 23 500 patients are admitted during a single year.[13]

Sixty-four of the 67 mental health inpatient units participated in the study. Two medium- and long-stay units declined to participate, and one dual disorders unit was excluded due to technical problems with the device during the measurements. An informational e-mail plus follow-up telephone calls were used to contact the managers who were in charge of each unit. These communications stated the objectives of the study and explained the study procedures. We also responded to any questions and asked for participation consent. The Research and Ethics Committee of Bellvitge University Hospital approved the study protocol, and the protocol was subsequently sent to and approved by the participants (if required by the unit).

For study purposes, the units were divided into four groups according to their smoking policies: 1: Indoor and outdoor ban ($n=7$); 2: Indoor ban ($n=31$); 3: Indoor smoking rooms (i.e. units that allowed smoking in designated indoor smoking rooms that were used only for smoking) ($n=14$); and 4: No smoking ban (i.e. units that allowed smoking in one or more indoor common areas, mainly living rooms, that were shared by smokers and non-smokers) ($n=12$).

During the study period, Spain was transitioning from implementation of one national smoking regulation to a newer regulation, which explains why the psychiatric units we studied had a variety of smoking policies. The previous law (Law 28/2005, which was enforced until December 2010) banned smoking in healthcare centres but exempted psychiatric units, where indoor and outdoor smoking areas were permitted. The new law (Law 42/2010, which was enforced starting in January 2011) extended the ban to outdoor hospital campuses, banned smoking areas (either indoor or outdoor) in short-stay psychiatric units and allowed smoking rooms in medium- and long-stay psychiatric units.[20]

Second-hand smoke assessment

We measured the mass concentration ($\mu g/m^3$) of respirable suspended particles with an aerodynamic diameter equal to or less than 2.5 μm($PM_{2.5}$) as a marker of second-hand smoke. Particles emitted from burning cigarettes are in a size range of 0.002–2 μm.[21] The measurements were performed

using a TSI Side Pak Personal Aerosol Monitor (model AM510; TSI Inc., MN, USA). This portable, hand-size, discreet device does not disturb the patients or the staff, nor does it affect their normal behaviour. The device uses a built-in sampling pump that draws air through the device. The particulate matter scatters the light from a laser, and the amount of light scattering is detected. The sample flow rate through the monitor was set at 1.7 l/min and logged $PM_{2.5}$ concentrations at 1-s intervals. The device was calibrated before the study using a K factor of 0.52[22] and was zero-calibrated prior to each use with a HEPA filter according to the manufacturer's specifications. $PM_{2.5}$ concentrations are provided in $\mu g/m^3$.

We performed measurements in three common locations in each unit: the living room, the main corridor and the staff room. We also assessed other locations when they existed, such as smoking rooms, outdoor smoking areas and an indoor area 5 m away from the outdoor or indoor smoking areas. Every location within each unit was tested for a period of 15 min, thus resulting in 45 to 90 min of measurements at each unit. At the same time, we recorded observational data for each location: the area and volume of the location, the presence of ventilation such as smoke extractors or opened windows and the number of cigarettes that were lighted during the monitoring session. We also conducted a control measurement at a location outside the mental health unit campus in order to register baseline $PM_{2.5}$ levels, which may be originated by traffic air pollution.

Statistical analysis

We report the $PM_{2.5}$ results as geometric mean concentrations due to their skewed distribution along with the 95% confidence intervals. We also calculated the median values and interquartile ranges and the arithmetic means and 95% confidence intervals. We compared $PM_{2.5}$ concentrations according to the type of ban in the units (the four groups mentioned above) using analysis of variance (ANOVA) for all the locations together and separately for the three common areas (living room, main corridor and staff room). We also conducted tests for linearity between the groups. Finally, we ran multiple linear regression models that were adjusted for potential confounders. We used log-transformed $PM_{2.5}$ concentrations for all of these analyses due to the skewed distribution. All analyses were carried out using PASW Statistics 18.0 (SPSS Inc., Chicago, IL, USA).

Results

We measured $PM_{2.5}$ concentrations at 241 locations in the 64 mental health inpatient units; 180 of the locations were common areas, i.e. a living room, main corridor or staff room. Table 1 summarizes the $PM_{2.5}$ concentrations according to the type of smoking ban implemented in the three common areas. The geometric means of the $PM_{2.5}$ concentrations were 8.81 $\mu g/m^3$ in units with indoor and outdoor smoking bans, 13.80 $\mu g/m^3$ in units that allowed smoking outside only, 24.29 $\mu g/m^3$ in units with a designated indoor smoking room and 51.00 $\mu g/m^3$ in units that allowed smoking in common indoor areas. There were differences in the $PM_{2.5}$ concentrations by the type of smoking ban, both globally and for each of the locations. There was a linear increase in the $PM_{2.5}$ concentration as the strictness of the smoking ban decreased ($P < 0.001$). The geometric mean of the $PM_{2.5}$ concentrations at control locations, i.e. measured outdoors away from the hospital campuses, was 10.88 $\mu g/m^3$ (95%CI: 10.26–11.52 $\mu g/m^3$).

Table 2 shows the $PM_{2.5}$ concentrations in 57 locations where smoking was allowed. During times when smoking was allowed ('smoking times'), the geometric mean $PM_{2.5}$ concentration was 24.76 $\mu g/m^3$ in outdoor areas (7.41 $\mu g/m^3$ at non-smoking times), 286.50 $\mu g/m^3$ in designated smoking rooms and 264.94 $\mu g/m^3$ in common areas shared by smokers and non-smokers (usually living rooms). The mean $PM_{2.5}$ concentration in indoor areas that were 5 m away from an outdoor smoking area was 20.92 $\mu g/m^3$.

After assessing the crude associations and checking mutual confounding by the independent variables, we fitted a regression model with several covariates (selected according the magnitude of the coefficients and its conceptual importance). No meaningful confounding effect of 'number of cigarettes lighted', 'time of measurement' or 'ventilation' was observed upon the rest of variables (coefficients changes ranging 4 to 7%). The final model showed that $PM_{2.5}$ concentrations (living room, main corridor and staff room combined) were associated with: the number of cigarettes lit during the measurement; the type of smoking ban (increasing concentrations as ban strictness decreased); the number of beds in the unit (higher $PM_{2.5}$ concentrations in units with more than 30 beds); the time of the measurement (higher $PM_{2.5}$ concentrations in measurements recorded after 14:00 h); and the presence of smoke extractors or opened windows (Table 3). The model explains 40.3% of the observed $PM_{2.5}$ variability.

Discussion

This study provides the first large data set of the levels of second-hand smoke in mental health inpatien units. The second-hand smoke concentrations were generally high, and these levels have been shown to have harmful health effects on humans, even increasing the risk of mortality.[23] The concentration of second-hand smoke varied according to the type of smoking ban, with increasing levels of second-hand smoke associated with decreasing smoking ban strictness.

Indoor levels of $PM_{2.5}$ are usually compared with the air quality standards established by the Air Quality

Table 1 Levels of $PM_{2.5}$ in psychiatric units depending on the type of smoking ban

Location	Indoor & outdoor ban	Indoor ban	Indoor smoking rooms	No smoking ban	Analysis		
					F	df	*P*
Total (*n*)	20	91	39	35			
Geometric mean (95% CI) (μg/m^3)	8.81 (8.06–9.56)	13.80 (13.23–14.36)	24.29 (23.50–25.03)	51.00 (49.83–52.04)	58.06	1	<0.001[a]
					22.17	3	<0.001[b]
Median (IQR) (μg/m^3)	9.88 (5.72–15.47)	12.48 (6.24–25.48)	22.88 (10.92–52.52)	34.32 (20.28–102.44)			
Arithmetic mean (95% CI) (μg/m^3)	10.01 (7.86–12.15)	23.81 (17.47–30.14)	35.81 (25.17–46.44)	119.65 (41.41–197.89)			
Maximum value (μg/m^3)	17.16	190.06	151.32	1293.24			
Living room (*n*)	7	32	14	12			
Geometric mean (95% CI) (μg/m^3)	9.32 (8.02–10.61)	12.35 (11.31–13.39)	29.08 (27.93–30.15)	93.59 (91.66–95.51)	37.89	1	<0.001[a]
					13.45	3	<0.001[b]
Median (IQR) (μg/m^3)	10.92 (5.72–15.08)	12.48 (5.33–27.17)	29.12 (15.08–62.53)	86.06 (30.68–231.40)			
Arithmetic mean (95% CI) (μg/m^3)	10.54 (6.70–14.37)	22.34 (12.27–32.40)	37.03 (23.89–50.16)	206.59 (6.60–406.57)			
Maximum value (μg/m^3)	16.64	116.48	85.28	1293.24			
Main corridor (*n*)	7	28	12	11			
Geometric mean (95% CI) (μg/m^3)	9.34 (8.13–10.55)	14.81 (13.84–15.79)	24.28 (22.68–25.88)	48.15 (46.02–50.15)	15.19	1	<0.001[a]
					5.11	3	0.003[b]
Median (IQR) (μg/m^3)	10.92 (5.72–15.60)	13.26 (6.89–31.07)	15.60 (9.84–71.11)	58.76 (19.76–102.44)			
Arithmetic mean (95% CI) (μg/m^3)	10.32 (6.74–13.89)	24.10 (14.07–34.12)	41.14 (14.78–67.49)	106.31 (15.54–197.08)			
Maximum value (μg/m^3)	17.16	102.44	151.32	645.32			
Staff room (*n*)	6	31	13	12			
Geometric mean (95% CI) (μg/m^3)	7.70 (6.22–9.19)	14.50 (13.57–15.44)	20.03 (18.66–21.34)	29.29 (27.89–30.70)	9.49	1	<0.01[a]
					3.28	3	0.027[b]
Median (IQR) (μg/m^3)	7.28 (4.42–15.60)	12.48 (7.28–22.88)	22.88 (8.06–38.22)	27.56 (15.60–60.84)			
Arithmetic mean (95% CI) (μg/m^3)	9.01 (4.70–13.32)	25.07 (12.29–37.84)	29.58 (13.33–45.82)	44.95 (15.64–74.25)			
Maximum value (μg/m^3)	15.60	190.06	111.80	190.06			

[a]Test for linearity.
[b]Analysis of variance (ANOVA).

Table 2 Levels of $PM_{2.5}$ in different types of smoking areas

$PM_{2.5}$	Outdoor smoking areas	Indoor smoking rooms (exclusively for smoking)	Shared indoor rooms
Total (*n*)	29	16	12
Geometric mean (95% CI) (μg/m^3)	20.11 (19.10–21.13)	165.80 (163.23–168.38)	115.49 (113.31–117.38)
Median (IQR) (μg/m^3)	19.24 (11.44–39.13)	162.63 (40.30–787.28)	123.37 (31.98–271.63)
Arithmetic mean (95% CI) (μg/m^3)	39.41 (8.87–69.95)	433.66 (179.56–687.75)	245.50 (41.98–449.01)
Maximum value (μg/m^3)	465.14	1866.80	1293.24
Smoking time (*n*)	24	12	6
Geometric mean (95% CI) (μg/m^3)	24.76 (23.71–25.72)	286.50 (283.95–288.89)	264.94 (262.63–267.19)
Median (IQR) (μg/m^3)	21.84 (13.65–43.09)	535.60 (101.98–869.44)	265.85 (86.97–707.46)
Arithmetic mean (95% CI) (μg/m^3)	45.47 (8.94–82.01)	562.61 (256.05–869.16)	418.21 (52.95–783.46)
Maximum value (μg/m^3)	465.14	1866.80	1293.24
Non smoking time (*n*)	5	4	6
Geometric mean (95% CI) (μg/m^3)	7.41 (5.03–9.80)	32.14 (29.49–34.78)	50.34 (48.33–52.35)
Median (IQR) (μg/m^3)	11.44 (2.60–17.42)	29.38 (14.56–96.46)	32.76 (27.49–159.83)
Arithmetic mean (95% CI) (μg/m^3)	10.29 (3.74–16.83)	46.80 (0.88–92.71)	72.80 (18.09–127.50)
Maximum value (μg/m^3)	18.20	113.88	162.76
5 m from the smoking area (*n*)[a]	22	15	8
Geometric mean (95% CI) (μg/m^3)	20.92 (19.81–21.98)	44.45 (43.07–45.65)	59.34 (56.61–61.97)
Median (IQR) (μg/m^3)	18.46 (11.31–39.91)	52.00 (13.52–87.88)	83.46 (19.76–103.22)
Arithmetic mean (95% CI) (μg/m^3)	31.92 (18.90–44.94)	62.26 (38.67–85.84)	133.25 (10.39–256.10)
Maximum value (μg/m^3)	108.16	154.18	645.32

[a]Only when there was an indoor area that was 5 m from the smoking area.

Guidelines[24] of the World Health Organization (WHO) for outdoor settings. WHO has established a mean concentration threshold of 10 μg/m^3 for long-term exposure. Specifically, a $PM_{2.5}$ of 10 μg/m^3 is the lowest level at which total cardiopulmonary and lung cancer mortality has been shown to increase (with more than 95% confidence) in response to long-term exposure. The results of our study show that only mental health units with total bans, i.e. units that do not allow smoking indoors or outdoors, had $PM_{2.5}$ concentrations below the WHO recommended threshold. In contrast, units with indoor smoking areas had 2- to 5-fold the recommended levels of $PM_{2.5}$ in their non-smoking areas. Notably, 25 and 35 μg/m^3 levels are associated with 9% and 15% increases in the risk of premature mortality, respectively.[24] Units with indoor smoking bans that allowed smoking outdoors also showed levels of $PM_{2.5}$ that were above the recommended WHO threshold. Taken together, these data suggest that tobacco smoke from outdoor or indoor smoking areas drifts into indoor non-smoking areas.[25]

When obtaining measurements in the different types of smoking areas, we observed very high levels of particulate matter (mean $PM_{2.5}$ levels >250 μg/m^3) in the indoor smoking areas. This result was especially concerning when the indoor smoking area was a common area, usually a living room, that was shared by smokers and non-smokers, both of whom spent a lot of time there. During smoking times, the levels of $PM_{2.5}$ in the outdoor smoking areas reached concentrations that were similar to the WHO recommended threshold for short-term exposure, 25 μg/m^3. However, our measurements showed that some outdoor smoking areas had higher levels of $PM_{2.5}$. For example, a measurement of 465 μg/m^3 of $PM_{2.5}$ was the maximum value in one small outdoor smoking area that was semi-covered and that became crowded during smoking times. In fact, outdoor levels of $PM_{2.5}$ can be markedly high, depending on the number of smokers, the location of adjacent walls and meteorological conditions.[25]

Locations in indoor units where smoking was not allowed but that were near (within 5 m) indoor or outdoor smoking rooms/areas showed high levels of $PM_{2.5}$ due to drifting tobacco smoke. Also, indoor levels of $PM_{2.5}$ slightly increased due to the exhaled air after the last cigarette puff smoked outdoors.[26] These results are interesting since partial smoking bans that only allow smoking outdoors are usually perceived to be safe smoking bans by staff.[19] Accordingly, the ineffectiveness of partial smoking bans in protecting staff from

Table 3 Factors associated with second-hand smoke: multiple linear regression model for $PM_{2.5}$[a]

Model	β	SE	95% CI	P Value	R^2
Constant	0.906	0.094	[0.720–1.091]	<0.001	
No. of cigarettes lit during the measurement	0.231	0.061	[0.112–0.351]	<0.001	
Type of smoking ban	0.203	0.053	[0.099–0.307]	<0.001	
Number of beds					
⩽30	Ref.				
>30	0.171	0.063	[0.046–0.296]	<0.01	
Outdoors areas					
Yes	Ref.				
No	0.069	0.118	[−0.164–0.301]	0.56	
Size of outdoor areas (m^2)					
⩽60	Ref.				
>60	−0.063	0.082	[−0.225–0.099]	0.44	
Established smoking times					
No smoking	Ref.				
Yes	−0.050	0.173	[−0.392–0.292]	0.77	
No	−0.206	0.162	[−0.525–0.113]	0.20	
Time of measurement					
⩽14:00 h	Ref.				
>14:00 h	0.212	0.076	[0.062–0.362]	<0.01	
Location volume (m^3)					
⩽80	Ref.				
>80	−0.021	0.058	[−0.136–0.093]	0.71	
Ventilation					
Yes	Ref.				
No	0.176	0.150	[0.032–0.320]	0.01	
					0.403

[a]Log-transformed $PM_{2.5}$ concentrations.

second-hand smoke was also observed in a previous observation in a single mental health unit with seven non-smoking workers.[27]

Levels of $PM_{2.5}$ were high inside the units, both in staff rooms and in specific smoking areas where staff must sometimes be present to supervise patients during the patients' smoking times. This is incompatible with health and safety risk management policies in the workplace. It would be interesting to study the actual impact of second-hand smoke on the health of these workers compared with non-exposed staff. Several studies have shown an improvement in health symptoms among hospitality employees after implementation of total smoking bans.[2]

The harmful health effects of second-hand smoke have been proven in the general population, but these effects may have a greater impact on patients with mental health disorders who are admitted to psychiatric hospitals, in view of the generally poor health of this population. These patients usually present with an unhealthy lifestyle in which heavy smoking, high alcohol intake, poor diet and physical inactivity has led to high rates of obesity, hypertension, diabetes and high blood cholesterol.[28] Some antipsychotic drugs increase the risk of adverse effects related to weight gain, high serum cholesterol and metabolic syndrome and thus confer a higher risk for cardiovascular diseases.[29] In addition, due to pharmacokinetic interactions, smokers have lower blood levels of some antidepressant and antipsychotic drugs, necessitating increases in the dosage.[30]

There is a persistent and increasing gap in mortality between discharged psychiatric patients and the general population.[31] Patients with severe mental health disorders have over three times the odds of having chronic bronchitis and chronic obstructive pulmonary disease than the general population[32] and have twice the risk for coronary heart disease, which is the leading cause of death in this population.[33] Moreover, recent studies suggest an association between second-hand smoke and both psychological distress and risk of future psychiatric illness in healthy adults.[34] Second-hand smoke may worsen the baseline condition of patients during their admission (which in turn can last up to several years). Passive smoking may also have an impact on patients admitted to short-stay units as it has harmful effects even when the duration of exposure is short. For instance, exposure to tobacco smoke for 30 min can cause endothelial dysfunction in the coronary circulation of nonsmokers.[35]

This study has some limitations. $PM_{2.5}$ is not a specific marker of second-hand tobacco smoke. However, this method of measurement obtains results that are similar to those using air nicotine concentrations (correlations ranging from 0.64 up to 0.98 between $PM_{2.5}$ concentrations and airborne nicotine).[22,36] Indeed, $PM_{2.5}$ concentration is widely used to assess second-hand smoke levels in indoor spaces,[22,36,37] with reliable results obtained in locations with low and high $PM_{2.5}$ concentrations.[22,36] We performed measurements at each unit on a single day with relatively short sampling times, and although other studies have performed similar measurements, longer sampling times may yield proportionately more reliable measurements.[37] Finally, the measurements were performed during the same season but in different geographical areas at different times; however, the outdoor $PM_{2.5}$ concentration used as a control measurement for all the units has low variability, which strengthens the reliability of the indoor measurements. The strengths of this study include the novelty of the results and the large sample, which included 95.5% of all inpatient mental health units in an area with more than 7 million inhabitants.

When considering how to provide a smoke-free environment in psychiatric units, the results of this study suggest that the focus should be on the type of smoking ban. However, smoke-free bans are often voluntary policies worldwide.[6] Implementing total bans would require improving resources that are often scarce in these settings, such as smoking intervention programmes,[38] the availability of smoking cessation drugs, training for staff to apply smoking interventions, etc.[8,13]

The high levels of second-hand smoke in inpatient mental health units highlight the need to be health-promoting and concurrently consider both the mental and physical health of these patients.[39] The findings of this study indicate that only total bans in mental health units protect patients and staff from second-hand smoke. The results may help policy makers decide what type of smoking policy to implement and could contribute to denormalizing smoking in mental health settings.

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KEY MESSAGES

- Smoking prevalence in patients admitted to inpatient mental health units could reach up to 80% and mental health units have usually been exempted from complete smoke-free bans.
- This study provides the first large data set of the levels of second-hand smoke in mental health inpatient units, measured through air concentrations of particulate matter <2.5 μm ($PM_{2.5}$) as a marker of second-hand smoke.
- Units with indoor smoking areas have 2- to 5-fold the recommended levels of $PM_{2.5}$ in their non-smoking areas.
- Only units with indoor and outdoor smoking bans have $PM_{2.5}$ levels below the standard recommended WHO levels.

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Second-hand smoke in psychiatric units: patient and staff misperceptions.

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Second-hand smoke in psychiatric units: patient and staff misperceptions

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ABSTRACT

Background

Mental health units have usually been exempted from complete smoke-free bans. The aim of this study was to compare the self-reported level of exposure to second-hand smoke (SHS) of patients and staff in psychiatric units to objective measures, and examine preference for different types of smoking bans.

Methods

Cross-sectional survey about bans' preferences and self-reported exposure to SHS by means of a self-administered questionnaire administered to patients and staff from 65 inpatient psychiatric units in Catalonia (95.5% of all units). We measured air concentrations of particulate matter ≤2.5μm ($PM_{2.5}$ in $\mu g/m^3$) as a marker of SHS in these units.

Results

Six hundred patients and 575 professionals completed the questionnaire. 78.7% of them were objectively exposed to SHS ($PM_{2.5}$>10$\mu m/m^3$) but 56.9% of patients and 33.6% of staff believed they were not exposed at all and 41.6% of patients and 28.4% of staff believed the environment was not at all unhealthy. Nurses had a higher smoking prevalence than psychiatrists (35.8% vs 17.2%; p<0.001). However, nurses had a higher perception of being moderately-highly exposed to SHS, (40.3% vs 26.2%; p<0.001). $PM_{2.5}$ levels were significantly different depending on the smoking ban implemented

but regardless of the perception of SHS levels by both patients and staff. Finally, 29.3% of staff and 14.1% of patients strongly agreed with total smoking bans.

Conclusions

Patients and staff have a substantial misperception about their exposure to SHS and low awareness about the harmful environment in which they stay/work. This might have an influence on the preference for less restrictive smoke-free bans.

Keywords

Tobacco smoke pollution, Smoking, Hospitals, Mental health services, Smoke-free policy, Psychiatry.

INTRODUCTION

The implementation of smoke-free policies in public places and workplaces in many countries has had beneficial consequences at a public health level, for example in cardiovascular and respiratory diseases[1, 2]. While such bans have been progressively extended worldwide to health care centres and other public places, psychiatric units have been usually exempted[3-5].

The absence of smoke-free bans or even partial bans in mental health units may send a message that smoking is an acceptable practice for patients whose smoking prevalence can reach up to 80%[6]. People with severe mental illness die approximately 25-30 years earlier than the general population, mainly because of conditions provoked or worsened by smoking[7].

Staff in mental health units are often reluctant to implement total bans in the health care centre buildings or grounds[8]. The main reasons for this concern relate to fears that total smoking bans will increase patients' aggression, restrain, and discharge against medical advice[4]. Nevertheless, there is compelling evidence showing that these consequences are unlikely to occur and that total bans result in much fewer disruptions than partial bans[9, 10].

Total bans in psychiatric units are the only types of smoking bans that safely protect against second-hand smoke (SHS) whereas partial bans may reach high levels of SHS with harmful health effects[11]. However, staff and patients seem to prefer partial bans[12, 13], which allow patients to smoke indoors and/or outdoors.

The aim of the study was to comparethe self-reported level of exposure to SHS of patients and staff in psychiatric units to air concentrations of particulate matter ≤2.5μm ($PM_{2.5}$) as a marker of SHS, together with their preference for different types of smoking bans.

METHODS

Study design and procedure

A cross-sectional study was conducted between November 2010 and March 2011. The target population was all the staff working and patients available during the time we visited each unit for the study. A complete list of public and private centres that offered public psychiatric services was obtained from the Health Department of the Catalan

Government. The study included all mental health inpatient units (n=67) that treated adult patients in Catalonia (Catalonia is located in the north-eastern part of Spain and has 7.5 million inhabitants). All these units have a total of approximately 2,300 beds, and more than 23,500 patients are admitted during a single year[14]. Of these 67 units, 16 were acute-patient units, 31 were sub-acute and medium- and long-stay units, 12 were detoxification or dual disorders units (the latest treating addictive disorders concurrent with other mental health disorders), and in the other 8 facilities two different types of units were present (e.g.: one single ward with acute and sub-acute patients or detoxification and dual disorders units in one single ward). All except two of the 67 mental health inpatient units participated in the study. Two medium- and long-stay units declined to participate.

During the study period, Spain was in the transition of implementing new smoking regulations to replace existing smoking policies, which explains why the psychiatric units we studied had a variety of smoking policies. The previous law (Law 28/2005, which was enforced until December 2010) banned smoking in health-care centres but excluded psychiatric units, where indoor and outdoor smoking areas were permitted. The new law (Law 42/2010, which was enforced starting in January 2011) extended the ban to outdoor hospital campuses, banned smoking areas (either indoor or outdoor) in short-stay psychiatric units, and allowed smoking rooms in medium- and long-stay psychiatric units[15].

Both, an e-mail with information about the study and follow-up telephone calls were used to contact the managers who were in charge of each unit and to arrange one single visit to conduct the survey and the measures of $PM_{2.5}$ levels in the unit at the same time.

The Research and Ethics Committee of Bellvitge University Hospital approved the study protocol, and the protocol was subsequently sent to and approved by the participant units, if required.

Questionnaire on SHS and smoking-policies

All patients and staff available in each unit during the visit were invited to respond to a brief self-administered questionnaire containing demographic data (age, sex, and profession in case of the staff), smoking status (never smokers, former smokers and current smokers) and number of cigarettes smoked per day (on working days in case of the staff, and during and before the admission in case of the patients). The questionnaire included two questions about SHS in the unit: (1) if they perceived to be exposed to SHS, and (2) if they thought this could be harmful to their health. Finally, respondents were asked about their level of support to four different types of smoking ban: (1) *Indoor and outdoor ban*; (2) *Indoor ban*; (3) *Indoor smoking rooms* (i.e. units that allow smoking in designated indoor smoking rooms that are used only for smoking); and (4) *No ban* (i.e. units that allow smoking in one or more indoor common areas, mainly living rooms, that are shared by smokers and non-smokers).

The questions about SHS and the support for different types of smoking bans were evaluated using a 5-point Lickert scale (0=*Not at all* to 4=*A lot/Strongly agree*).

All patients and staff were asked to sign an informed consent and the questionnaire was anonymous and self-reported. The researcher offered help to clarify the filling of the questionnaire.

Patients who were legally incapacitated or with cognitive functions unable to understand the questionnaire and the informed consent were excluded from the study. Staff were consulted on patients' eligibility.

Second-hand smoke objective assessment

We measured the concentration of respirable suspended particles with an aerodynamic diameter equal to or less than 2.5μm ($PM_{2.5}$ in $\mu g/m^3$) as an objective marker of second-hand smoke. The measurements were performed using a TSI Side Pak Personal Aerosol Monitor (model AM510; TSI Inc, MN, USA). This portable hand-size, discreet device does not disturb the patients or the staff, nor does it affect their normal behaviour. The device logged $PM_{2.5}$ concentrations at one-second intervals, was calibrated before the study using a *K* factor of 0.52[16] and was zero-calibrated prior to each use with a HEPA filter according to the manufacturer's specifications. The procedures have been described previously in detail[11].

We performed measurements in three common locations in each unit: the living room, the main corridor, and the staff room. Every location was tested for a period of 15 minutes and the median concentrations of $PM_{2.5}$ in $\mu g/m^3$ and interquartile ranges were reported for all the three measurements together for each unit (resulting in 45 minutes measurements at each unit). We also measured control measurements (outside the hospital campus) in order to register baseline $PM_{2.5}$ levels.

The measurements were performed at the same time as the surveys were completed. Measurements on one dual disorders unit were excluded due to technical problems with the PM device during the field work which made the measurements unreliable.

Statistical analysis

For the analysis of the variable "number of cigarettes smoked" we performed Wilcoxon tests for paired samples and Mann-Whitney U tests and Kruskal Wallis tests for independent samples, due to the non-normal distribution of the variable. We also performed multiple linear regression models adjusting for clustering within units.

For descriptive analyses, response categories for the Lickert type's items were collapsed from five ("Not at all", "A little", "Medium / Half", "Quite a bit", "A lot / Strongly agree") to three ("Not at all", "A little / Medium / Half" and "Quite a bit / A lot / Strongly agree"). We conducted binary logistic regression models adjusting for clustering within units in order to compare response rates.

We compared $PM_{2.5}$ concentrations according to the type of ban in the units and patients' and staff' self-reported level of SHS exposure using multiple linear regression models in order to adjust for clustering within units. We also conducted tests for linearity between the groups. We used log-transformed $PM_{2.5}$ concentrations for all of these analyses due to the skewed distribution.

A p-value <0.05 was considered significant and all analyses were carried out using PASW Statistics 18.0 (SPSS Inc, Chicago IL, USA).

RESULTS

Among the 65 participant units, 600 patients (27.7% of the total patients admitted to the units at the time of our visit) and 575 professionals (80.1% of the total staff working in

the units at the time of the study visit) completed the survey. The non-participation rate ranged between 30% and 50% for patients, and 0.5% to 10% for professionals. Among patients, 335 (58.3%) were male and 240 (41.7%) female, with a mean age of 43.0 years (SD=12.8, range 18-81). Among professionals, 168 (29.3%) were male and 405 (70.7%) female; the mean age was 37.7 years (SD=10.7, range 18-68); 99 (17.4%) were medical doctors, 346 (60.4%) were nurses, and 127 (22.2%) were other professionals. 52.1% of the medical doctors responded the questionnaire, 97.8% of the nurses, and 76.5% of the other professionals.

Cigarette smoking

Patients

Most of the patients' interviewed (442; 74.4%) were smokers, with 43 (7.2%) of ex-smokers, and 109 (18.4%) never smokers. Table 1 shows the number of cigarettes smoked per day depending on several variables. Patients smoked less cigarettes while in-patient when they had smoking breaks scheduled throughout the day than those in units without predefined smoking breaks ($p<0.001$). Moreover, patients smoked less in units without outdoor areas than those admitted in units with outdoor areas available (terraces or gardens) ($p=0.008$).

Table 1. Number of cigarettes smoked per day by patients

	n	Mean	Standard Deviation	p-value	p-value[f]
All					
Before admission	397	23.8	14.8	<0.001[a]	--
During hospitalisation	397	16.2	11.0		
Sex					
Before admission[e]					
Male	237	24.8	14.5	0.028[b]	0.048
Female	148	21.4	14.0		
During hospitalisation[e]					
Male	244	17.0	11.1	0.055[b]	0.035
Female	147	14.7	9.6		
Age (before admission)[e]					
18-34	107	19.4	11.4	0.007[c]	0.031
35-49	199	26.0	15.0		
50-64	80	23.9	15.5		
> 65	6	15.2	8.0		
Age (during hospitalisation)[d]					
18-34	108	15.8	7.7	0.117[c]	0.285
35-49	201	17.1	11.9		
50-64	84	14.6	10.0		
> 65	6	10.5	15.7		
Characteristics of the unit					
Outdoor areas[d]					
Yes	293	17.4	10.9	0.001[b]	0.008
No	112	13.4	10.2		
Established smoking breaks[d, e]					
Yes	164	14.6	7.4	<0.001[b]	<0.001
No	214	19.4	12.0		

[a]Wilcoxon for paired samples.
[b]Independent samples Mann-Whitney U test.
[c]Kruskal Wallis test.
[d]No differences found before admission.
[e]The figures do not sum up the total because of some missing values.
[f] p-value adjusted for clustering within mental health units by means of multiple linear regression models.

Patients who smoked between 1 to 15 cigarettes per day before admission tended to increase their cigarette consumption mean while in-patient (from 8.9 to 11.4 cig./day; p=0.002). Patients who smoked more than 15 cigarettes per day smoked less while in-

patient: patients who smoked 16 to 20 cigarettes decreased from a mean of 19.8 to 16.3, patients who smoked 21 to 30 cig. decreased from a mean of 29.1 to 17.7, and patients who smoked equal to or more than 31 cigarettes per day reduced smoking from a mean of 45.7 to 21.0 ($p<0.001$) after their admission.

Staff

Concerning the smoking status, 32.2% of the staff's sample were current smokers (17.2% of the medical doctors, 32.6% of the nurses, 39.4% of the assistant nurses; $p<0.001$). No differences were found according to the type of smoking ban implemented in the unit where the professional worked.

The mean number of cigarettes smoked per day by staff during working days was 11.0 (SD=5.5). We did not find differences in the number of cigarettes/day smoked according to: sex, age, the existence of outdoor areas in the unit, nor type of smoking ban implemented in the unit.

Support to different smoking bans

As shown in table 2, we found significant differences in the degree of support for both patients and staff depending on their smoking status. Smokers were significantly less likely to support the most restrictive smoking bans and more likely to support the most permissive ones.

Patients

Patients firstly agreed with units having indoor smoking rooms (62.1% quite/strongly agree), secondly with indoor bans allowing smoking outside (49.2%), 18.1% agreed

with not having any type of smoking ban and, finally, 14.1% agreed with total smoking bans.

Staff

As shown in table 2, staff agreed with indoor bans where patients are allowed to smoke outside (59.7% agreed or strongly agreed) more than with other type of smoking bans: indoor smoking rooms (36.3%), total bans (29.3%) and no bans (2.9%). No differences were found depending on the profession of the staff.

Less than half of the staff (44.4%) working in units with total bans agreed or strongly agreed with this type of ban.

Table 2. Support for different types of smoking bans by patients and staff.

		Indoor & outdoor ban		Indoor ban		Indoor smoking rooms		No ban	
	n	%	95%CI	%	95%CI	%	95%CI	%	95%CI
PATIENTS									
All Patients	600	14.1	11.3-16.9	49.2	45.2-53.2	62.1	58.2-66.0	18.1	15.0-21.2
Sex									
Male	335	13.0	9.4-16.6	48.9	43.5-54.3	61.4	56.2-66.6	20.4	16.1-24.7
Female	240	14.0	9.6-18.4	49.8	43.5-56.1	62.8	56.7-68.9	14.5	10.0-19.0
p-value		0.728		0.837		0.739		0.077	
Age									
18-34	151	12.1	6.9-17.3	45.3	37.4-53.2	66.2	58.7-73.7	21.8	15.2-28.4
35-49	259	10.9	7.1-14.7	47.2	41.1-53.3	63.3	57.4-69.2	19.5	14.7-24.3
50-64	142	15.8	9.8-21.8	57.1	49.0-65.2	54.7	46.5-62.9	13.0	7.5-18.5
≥65	34	40.6	24.1-57.1	57.6	41.0-74.2	66.7	50.9-82.5	9.1	3.0-23.0
p-value		0.009		0.031		0.419		0.043	
Smoking status									
Smoker	442	8.1	5.6-10.6	45.6	41.0-50.2	70.3	66.0-74.6	21.8	18.0-25.6
Non-smoker	152	31.3	23.9-38.7	58.6	50.8-66.4	39.3	31.5-47.1	8.2	3.8-12.6
p-value		<0.001		0.005		<0.001		<0.001	
Type of ban in the unit									
Indoor & outdoor ban	43	24.4	11.6-37.2	65.1	50.9-79.3	52.4	37.5-67.3	9.3	0.6-18.0
Indoor ban	364	12.4	9.0-15.8	53.4	48.3-58.5	53.0	47.9-58.1	19.3	15.2-23.4
Indoor smoking rooms	120	15.9	9.4-22.4	36.6	28.0-45.2	79.5	72.3-86.7	20.7	13.5-27.9
No ban	73	13.9	6.9-21.8	38.9	27.7-50.1	83.3	74.7-91.9	13.7	5.8-21.6
p-value		0.271		0.002		<0.001		0.285	
STAFF									
All Staff	575	29.3	25.6-33.0	59.7	55.7-63.7	36.3	32.4-40.2	2.9	1.5-4.3
Sex									
Male	168	31.5	24.5-38.5	57.3	49.8-64.8	33.9	26.7-41.1	2.4	0.1-4.7
Female	405	28.3	23.9-32.7	60.6	55.8-65.4	37.2	32.5-41.9	3.1	1.4-4.8
p-value		0.457		0.476		0.463		0.680	
Age									
18-34	249	23.6	18.3-28.9	60.6	54.5-66.7	40.4	34.3-46.5	2.8	0.8-4.8
35-49	225	33.0	26.9-39.1	58.7	52.3-65.1	36.4	30.1-42.7	3.7	1.2-6.2
50-64	97	34.7	25.2-44.2	60.4	50.7-70.1	24.7	16.1-33.3	1.1	0.2-5.6
≥65	-	-	-	-	-	-	-	-	-
p-value		0.020		0.875		0.014		0.385	
Type of staff									
Medical s.	99	27.1	18.3-35.9	59.8	50.1-69.5	38.1	28.5-47.7	2.1	0.6-7.1
Nurses*	346	29.9	25.1-34.7	59.1	53.9-64.3	37.5	32.4-42.6	3.3	1.4-5.2
Registered nurses	185	33.9	27.1-40.7	63.8	56.9-70.7	40.1	33.0-47.2	2.2	0.1-4.3
Assistant nurses	161	25.3	18.6-32.0	53.5	45.8-61.2	34.4	27.1-41.7	4.5	1.3-7.7
Other	127	30.1	22.1-38.1	60.3	51.8-68.8	30.5	22.5-38.5	2.5	0.8-6.7
p-value		0.847		0.965		0.385		0.800	
Smoking status									
Smoker	185	15.2	11.6-18.8	51.6	44.4-58.8	47.5	40.3-54.7	4.4	1.4-7.4
Non-smoker	388	35.9	29.0-42.8	63.3	58.5-68.1	30.5	25.9-35.1	1.9	0.5-3.3
p-value		<0.001		0.008		<0.001		<0.001	
Type of ban in the workplace									
Indoor & outdoor ban	55	44.4	31.3-57.5	52.8	39.6-66.0	22.6	11.5-33.7	1.9	0.3-9.6
Indoor ban	265	26.4	21.1-31.7	67.8	62.2-73.4	28.3	22.9-33.7	1.5	0.0-3.0
Indoor smoking rooms	130	27.5	19.8-35.2	47.2	38.6-55.8	50.0	41.4-58.6	2.4	0.8-6.6
No ban	125	30.6	22.5-38.7	58.1	49.5-66.7	45.0	36.3-53.7	6.6	2.2-11.0
p-value		0.066		0.001		<0.001		0.077	

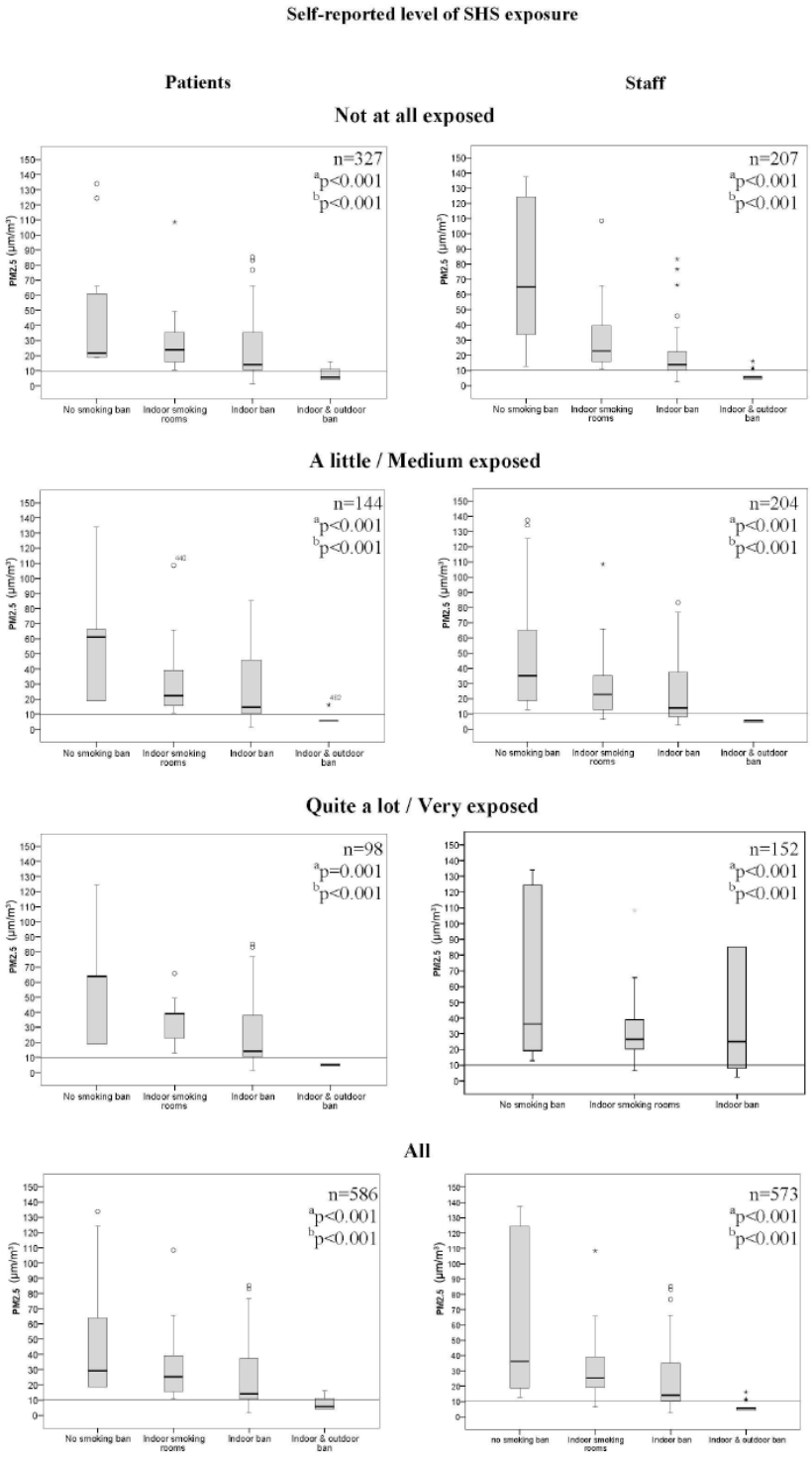
Percentages of answers "Strongly agree/Agree" vs "Neither agree nor disagree", "Disagree" and "Strongly disagree".
*Registered nurses: with a university degree; three years degree.
Assistant nurses: with a diploma; skilled workers.
P-value adjusted for clustering within mental health units by means of binary logistic regression models.

Perception of SHS level vs. objectively assessed level of SHS

Figure 1 shows $PM_{2.5}$ concentrations depending on the type of smoking ban implemented and according to the perceived second-hand smoke levels by the patients and the staff in the unit. The geometric mean of the $PM_{2.5}$ concentrations at control locations was 10.88 $\mu g/m^3$ (95% CI: 10.26–11.52 $\mu g/m^3$).

$PM_{2.5}$ concentration levels were significantly different depending on the smoking ban implemented in the unit and regardless of the perception of second-hand smoke levels by both the patients and the professionals.

Figure 1. $PM_{2.5}$ concentrations (in µg/m3) according to different smoking bans implemented in the units and to the self-reported level of SHS exposure.



[a]Multiple linear regression models adjusted for clustering within units.
[b]Test for linearity.
10 µg/m^3 is the WHO recommended threshold for $PM_{2.5}$ concentration levels for long exposures (horizontal line). Boxes represent 25th and 75th percentiles of the observations (interquartile range, IQR), with the middle bar representing the median, whiskers represent the minimum and maximum non-atipic values; circles represent outliers (values between 1.5 IQRs and 3 IQRs from the end of the box), and asterisks represent extreme values (values more than 3 IQRs from the end of the box).

As shown in table 3, in both patients and staff, smokers usually perceived to be less exposed to SHS than non-smokers.

Patients

Among patients, 78.8% (n=473) were exposed to $PM_{2.5}$ in their unit over the WHO recommended levels for long exposures ($PM_{2.5}$ concentrations of 10 $\mu g/m^3$ or over). Among the sample of patients who were exposed to $PM_{2.5}$ over the WHO recommended limit, 56.9% of them reported not being exposed to SHS at all in the unit (mean $PM_{2.5}$ concentration of 23.6 $\mu g/m^3$ in their units). Moreover, 41.6% of these patients though that the unit's environment was not at all harmful for their health, while 32.7% thought that it was quite a lot or very harmful.

As shown in table 3, female, younger and non-smoker patients significantly perceived higher exposure to SHS. Only 26.4% of the patients admitted to units without any smoking ban thought they were a lot or quite a lot exposed to SHS ($PM_{2.5}$ concentration of 51.0 $\mu g/m^3$ in that units).

Staff

Among staff, 78.8% of them (n=453) were exposed to $PM_{2.5}$ in their unit over the WHO recommended limit. Among those professionals, 33.6% reported that they were not at all exposed and 28.4% thought the environment of their unit was not at all unhealthy. There were no differences in this perception between smokers and non-smokers. Some differences were found depending on the profession: medical doctors were less likely than nurses to consider that they were highly exposed to SHS inside their unit (7.1% vs. 36.7%; $p<0.001$). Consequently, 46.3% of the nurses and 26.8% of the doctors considered this environment strongly harmful for their health ($p<0.001$).

$PM_{2.5}$ concentrations where five times over the recommended WHO levels ($PM_{2.5}$ concentrations of 51.0 $\mu g/m^3$ in that units) in units where smoking was allowed indoors in common areas. However, only half of this staff considered being quite or highly exposed. In units with indoor smoking rooms (twofold the WHO recommended limit; $PM_{2.5}$=24.2 $\mu g/m^3$), 39.1% of the staff perceived to be quite or highly exposed. Finally, in units allowing smoking only outdoors, 48.9% of the staff reported they were not at all exposed to SHS, while mean $PM_{2.5}$ concentrations for those units were 22.3 $\mu g/m^3$ (twofold the recommended WHO limit).

Table 3. Self-reported exposure to second-hand smoke.

		A lot / quite a lot		Medium / A little		None	
n		%	95%CI	%	95%C	%	95%CI
Patients							
All patients	581	17.2	14.1-20.3	25.3	21.8-28.8	57.5	53.5-61.5
Sex							
Male	324	13.3	9.6-17.0	27.2	22.4-32.0	59.6	54.3-64.9
Female	235	22.6	17.3-27.9	22.1	16.8-27.4	55.3	48.9-61.7
p-value		0.004		0.180		0.299	
Age							
18-34	147	23.1	16.3-29.9	32.7	25.1-40.3	44.2	36.2-52.2
35-49	254	16.1	11.6-20.6	22.4	17.3-27.5	61.4	55.4-67.4
50-64	135	14.1	8.2-20.0	19.3	12.6-26.0	66.7	58.7-74.7
≥65	33	15.2	3.0-27.4	33.3	17.2-49.4	51.5	34.4-68.6
p-value		0.040		0.349		0.016	
Smoking status							
Smoker	427	14.8	11.4-18.2	23.4	19.4-27.4	61.8	57.2-66.4
Non-smoker	149	24.2	17.3-31.1	30.2	22.8-37.6	45.6	37.6-53.6
p-value		0.013		0.132		0.001	
Type of ban in the unit							
Indoor & outdoor ban	43	17.2	5.9-28.5	25.3	12.3-38.3	57.5	42.7-72.3
Indoor ban	348	15.8	12.0-19.6	21.8	17.5-26.1	62.4	57.3-67.5
Indoor smoking rooms	118	20.3	13.0-27.6	33.9	25.4-42.4	45.8	36.8-54.8
No ban	72	26.4	16.2-36.6	34.7	23.7-45.7	38.9	27.6-50.2
p-value		0.051		0.016		<0.001	
Staff							
All staff	565	27.1	23.4-30.8	36.1	32.1-40.1	36.8	32.8-40.8
Sex							
Male	167	28.7	21.8-35.6	32.9	25.8-40.0	38.3	30.9-45.7
Female	396	26.5	22.2-30.8	37.1	32.3-41.9	36.4	31.7-41.1
p-value		0.592		0.343		0.003	
Age							
18-34	247	24.3	19.0-29.6	43.7	37.5-49.9	32.9	27.0-38.8
35-49	220	28.2	22.3-34.1	30.0	23.9-36.1	41.8	35.3-48.3
50-64	95	30.5	21.2-39.8	31.6	22.3-40.9	37.9	28.1-47.7
≥65	-	-	-	-	-	-	-
p-value		0.078		0.003		0.277	
Type of staff							
Medical staff	98	7.1	2.0-12.2	48.0	38.1-57.9	44.9	35.1-54.7
Nurses	341	36.7	31.6-41.8	33.7	28.7-38.7	29.6	24.8-34.4
Registered nurses	182	26.9	20.5-33.3	37.9	30.9-44.9	35.2	28.3-42.1
Assistant nurses	159	47.8	40.0-55.6	28.9	21.9-35.9	23.3	16.7-29.9
Other	123	17.1	10.4-23.8	31.7	23.5-39.9	51.2	42.4-60.0
p-value		<0.001		0.022		0.022	
Smoking status							
Smoker	182	28.6	22.0-35.2	29.1	22.5-35.7	42.3	35.1-49.5
Non-smoker	381	26.2	21.8-30.6	39.6	343.7-44.5	34.1	29.3-38.9
p-value		0.585		0.015		0.015	
Type of ban in the workplace							
Indoor & outdoor ban	52	0	-	25.0	13.2-36.8	75.0	63.2-86.8
Indoor ban	262	15.6	11.2-20.0	35.5	29.7-41.3	48.9	42.8-55.0
Indoor smoking rooms	128	39.1	30.6-47.6	45.3	36.7-53.9	15.6	9.3-21.9
No ban	123	50.4	41.6-59.2	32.5	24.2-40.8	17.1	10.4-23.8
p-value		<0.001		0.022		0.045	

Patients: n=600 / Staff: n=575

P-value adjusted for clustering within mental health units by means of binary logistic regression models.

DISCUSSION

This study provides the first data about patients'and staff's perception of self-exposure to SHS in their workplace/unit compared with objective measures in mental health-care units that have different types of smoke-free bans implemented. We found that there is a substantial gap between patients' and staff's perceptions and objective measures. Patients and staff usually tend to underestimate their SHS exposure, mainly in units without any smoking ban implemented. Consequently, they are also not completely aware of the potential harmful health effects they may suffer when working or living in units with high to very high SHS levels.

In our study, the implementation of total smoke-free bans did not influence smoking cessation in staff. Although some studies have reported similar results[13, 17], others have found a beneficial impact of these bans on the staff's smoking prevalence[18]. Maybe, this effect was not observed in our study because most of the units with total bans were recently implemented.

The smoking prevalence in our patients' sample was 74%. A similar high smoking prevalence has been obtained in other studies despite the year of the study[6, 19]. Similar to the results obtained in the study of Keizer et al., patients smoked less while in-patient except for those with the lowest nicotine intake[20]. On the other hand, smoking prevalence among the staff participating in our study (32.2%) was higher than in the general population (29.5%)[21] and, as found in other studies, smoking prevalence was even higher (35.8%) in non-medical staff[22].

Nurses perceived the unit as very polluted more frequently than medical doctors. Consequently, they were more aware about the potential harmful health effects of the

environment where they used to work. In contrast, doctors significantly underestimated SHS levels and the potential harmful health effects of working in the unit. This could be due to the longer time nurses spend in the unit. Despite this, nurses had a higher smoking prevalence than medical doctors, which could imply an ambivalent position about nurses' tobacco consumption. Moreover, even though nurses were more aware of the potential adverse health effects, there was no difference in the preference for types of smoking bans. This could be explained because nurses, who have to manage patients' behaviour daily, might perceive a negative impact on the mental health or behaviour of the patients when smoking is not allowed[10, 23].

Few studies have examined staff support for smoke-free bans in mental health settings. In our study only 29.3% of the staff were highly supportive of total bans regardless of their smoking status or profession, contrary to other studies[10, 19, 22]. Half of the staff working in units with total smoke-free bans were highly supportive of these bans. Partial bans, allowing patients to smoke outdoors, were the most preferred type of ban as also found in other countries[13, 24] [25]. Generally, it has been found that mental health staff express significantly less positive attitudes than general setting staff to smoke-free bans[12].

Only units with indoor and outdoor smoking bans had $PM_{2.5}$ levels below the standard recommended WHO limit for long exposures and units with indoor smoking areas had 2- to 5-fold the recommended levels of $PM_{2.5}$ in non-smoking areas[11]. Notably, 25 and 35 $\mu g/m^3$ levels are associated with 9% and 15% increases in the risk of premature mortality, respectively[26]. $PM_{2.5}$ concentrations were significantly different depending on the smoking ban implemented, regardless of the patients and staff perception of SHS levels. We would expect similar low $PM_{2.5}$ levels for the units where the staff and

patients declared to be not exposed to SHS at all. However, units where staff and patients declared they were not exposed to SHS at all had 2 to 6 times SHS levels over the WHO recommended threshold. This difference was bigger for staff than for patients. Overall, we found a perception bias in patients and staff from units with all different types of smoking ban except for those with total smoke-free bans. This may be due to the normalisation effect of smoking in psychiatric units. In fact, support for total smoke free bans usually increase after their implementation[27, 28]. Many mental health units have not yet implemented total smoke-free bans and have not begun the denormalisation process that may contribute to underestimate the SHS levels.

This study has some limitations. First, we asked staff to respond the questionnaire at the time we visited the unit (mainly in the mornings, when there is more staff); hence, staff usually working on other shifts (weekends, at night or in the afternoon) were not, or at least, less represented. In addition, psychiatrist were not as easily available in the wards as nurses, because they usually spend limited time in the wards making daily visits to the in-patients and spend the rest of their working shift in other facilities, i.e., attending outpatients, where we could not ask their participation. In the case of the patients, the percentage of participation was lower compared with staff because we did not ask for collaboration to patients with the study's exclusion criteria, to patients who remained in their private rooms, were sleeping, or those who we did not have access (patients out of the unit with permissions or who were out throughout the gardens). A second limitation is that current smoking status could not be objectively assessed. Moreover, recall bias could be present in the estimates of the number of cigarettes smoked before admission among patients. Thirdly, the relatively high smoking prevalence in Spain may have an impact on the results, although other studies in other countries have shown similar

results in the preference for partial bans. And finally, $PM_{2.5}$ is not a specific marker of second-hand tobacco smoke. However, this method of measurement obtains results that are similar to those using air nicotine concentrations in the absence of other sources of combustion[16, 29, 30] and has been widely used to assess second-hand smoke levels in indoor spaces[31]. Moreover, $PM_{2.5}$ control measurements showed low variability which strengthens the reliability of the indoor measurements.

The strengths of this study include its novelty, which has linked the perceived exposure of SHS in mental health settings to objective measures depending of the type of smoking ban implemented. It is also of note the large sample of staff and patients, which also comes from a large sample of mental health units from a comprehensive area that covers more than 7 million inhabitants (95.5% of all such existing units in the area).

CONCLUSIONS

In order to enhance awareness of the importance of implementing total smoke-free bans in the units it would be useful to plan briefing sessions for staff reporting data from measures of the SHS levels and the related potential health consequences for patients and themselves. Education addressing the benefits of total smoke-free bans has also been described as a key component in the sustainability of such bans[32]. The misperception about the self-exposure to SHS and its potential harmful health effects would lead, to a certain extent, to a greater support for partial bans by patients and staff. Smoke-free environments along with smoking cessation interventions in psychiatric units are an important step targeting quality of life and life expectancy in this special population.

What this paper adds

- There is a substantial misperception about the real exposure to second-hand tobacco smoke in mental health-care settings, both by patients and by staff.

- Medical doctors (vs. nurses) and smokers (vs. non smokers) have a lower perception of being highly exposed to second-hand smoke in the mental health units.

- Low awareness of the staff about the harmful environment in which they work might have an influence on the preference for less restrictive smoke-free bans.

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Competing interests

None

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Contributors

MB, XS, AG, and EF designed the study protocol, which was revised by JMMS and ES. MB and XS collected the data and, with JMMS and MF, performed the statistical analyses. All authors contributed to the interpretation of the study findings. MB drafted the manuscript, and all authors helped revise it for relevant intellectual content. All authors approved the final version of the manuscript. EF is the guarantor.

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Association of second-hand smoke exposure at home with psychological distress in the Spanish adult population

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ABSTRACT

Introduction: Second-hand smoke (SHS) exposure has been associated with increased risks of respiratory and heart diseases. However, little is known about the potential effects of SHS on psychological distress. The aim of this study is to examine the association of SHS exposure at home with psychological distress in Spain.

Methods: A cross-sectional survey about SHS exposure, socio-demographic and health related variables, and psychological distress, measured with the 12-item version of the General Health Questionnaire (GHQ-12) with a cut-off score ≥3, was conducted from 2011-2012 among a representative sample of the adult population (aged ≥15 years) of Spain. From the total sample (n=21,007), we used the subsample of never-smokers (n=11,214). We computed the odds ratios (OR) and their 95% confidence intervals (95%CI) for scoring ≥3 on the GHQ by means of unconditional multiple logistic regression models adjusted for sex and age.

Results: In the subsample, 9.7% (n=1,090) responded that they were exposed to SHS at home. The prevalence of subjects scoring ≥3 on the GHQ was higher for the sample exposed to SHS (22.7%) than for the non-exposed sample (18.9%; OR: 1.39; CI: 1.19-1.62). This association was also present when stratified for sex, age, marital status, socio-economic status, perceived general health, presence of any chronic disease, and alcohol intake.

Conclusions: Exposure to SHS at home is associated with psychological distress. Further investigation is necessary to determine if this association is causal. Avoiding SHS exposure at home could have beneficial effects on psychological distress.

Keywords: Tobacco smoke pollution; Mental Health; Adult; Spain.

1. INTRODUCTION

Second-hand smoke (SHS) exposure causes respiratory and heart diseases in non-smokers (U.S. Department of Health and Human Services, 2014). This robust evidence has encouraged many countries to implement smoke-free policies in public places and workplaces to protect the health of non-smokers. These smoke-free policies have beneficial consequences mainly on cardiovascular diseases and respiratory symptoms (Callinan, Clarke, Doherty, & Kelleher, 2010; Tan, & Glantz, 2012).

People with mental disorders have a higher prevalence of smoking than the general population (Lasser et al., 2000) and smoking has been clearly linked to mental disorders in many ways, as a consequence as well as a cause (Breslau, Kilbey, & Andreski, 1991; Khantzian, 1997; Morissette, Tull, Gulliver, Kamholz, & Zimering, 2007). Smoking has been linked with the onset of some mental disorders (Chaiton, Cohen, O'Loughlin, & Rehm, 2009; Johnson et al., 2000; Morissette et al., 2007). Moreover, quitting smoking has been associated with reduced symptoms of several disorders, such as anxiety or depression, and with improvements in positive moods, stress, and quality of life (Taylor, Miller, Cameron, Fagans, & Das, 2005).

Despite the relationship between smoking and mental health disorders, the potential effects of SHS exposure on psychological distress have only recently been considered (Bandiera, 2011). Except for some speculation that appeared years ago (Wilson, 1975), there are few studies evaluating this emerging topic. If there is a causal association between SHS exposure and mental distress, the explanation for this is not clear but some hypotheses have been established: a) nicotine may mimic the physiological effects

of anxiety by increasing the blood pressure and heart rate (Asbridge et al., 2013); b) there may be neurobiological mechanisms involving neural pathways through the dopamine system (Bahk, Li, Park, & Kim, 2002). Long-term exposure to SHS may lead to a decrease in the dopamine receptor availability, as with first-hand smoking (Bandiera, 2011). Smokers genetically predisposed to a low resting intrasynaptic dopamine level have heightened smoking-induced dopamine release, which has been associated with greater depression and anxiety (Brody et al., 2009). This genetic predisposition may also be relevant to SHS exposure (Hamer et al., 2011).

To date, no previous studies have associated SHS exposure with psychological distress in Spain, where national regulation protects population from SHS in public places since 2006 but smoking is still quite prevalent (26.9% in 2012) (*Encuesta Nacional de Salud de España*, ENSE)

The aim of this study was to examine the association between SHS exposure at home and psychological distress in a representative sample of the general population of Spain.

2. METHODS

2.1. Study design and sample

The study is based on a cross-sectional analysis of the Spanish National Health Interview Survey of 2012 (*Encuesta Nacional de Salud de España*, ENSE) for the adult population with data collection from July 2011 to June 2012 (Ministerio de Sanidad, Servicios Sociales e Igualdad). The ENSE is conducted every five years and draws a nationally representative sample from the general population, aged ≥15 years and living

in households. The data are collected through home-based interviews and include socio-demographic data, health status, life-styles, use of health services, and other variables potentially influencing health.

The final response rate was 89.6%, including 61.4% of the initial theoretical sample and 28.2% of substitutions (Ministerio de Sanidad, Servicios Sociales e Igualdad). The final sample was composed of 21,007 adults. For this analysis, we only used data from those who self-reported never smoking any type of combustible tobacco (53.5%); hence, we excluded smokers (26.9%) and ex-smokers (19.6%) to avoid potential current or residual effects from smoking on psychological distress.

2.2. Study variables

The dependent variable was psychological distress, measured using the 12-item version of the General Health Questionnaire (GHQ-12) (Goldberg et al., 1997). The GHQ-12 is a standard measure of psychological distress devised for population studies and inquires about current states of particular symptoms or behaviors over the preceding weeks. The survey has a 4-point response scale (0-1-2-3) transformed into a score (0-0-1-1). The GHQ-12 has high validity, internal consistency, sensitivity, and specificity in the Spanish population (Rajmil, Gispert Magarolas, Roset Gamisans, Muñoz Rodríguez, & Segura Benedicto, 1998; Rocha, Pérez, Rodríguez-Sanz, Borrell, & Obiols, 2011; Sánchez-López & Dresch, 2008), and the cut-off score for psychological distress has been established at ≥3 (Muñoz-Rodríguez, 1995).

The independent variables included socio-demographic variables such as sex, age, marital status, and socio-economic status (I: managerial staff with ≥10 workers and liberal professionals with university degree; II: managerial staff with <10 workers and

liberal professionals with university certificate; III: Intermediate occupations and independent workers; IV: supervisors and skilled workers in qualified technical occupations; V: skilled workers from the primary sector and other semi-skilled workers; VI: non-skilled workers). We recoded the socio-economic variable in three categories (groups I-II, III-IV, V-VI). There were also health related independent variables including perceived general health; the presence of any self-reported chronic/long term disease; and alcohol intake, assessed with an every-day quantity-frequency questionnaire on the consumption of a variety of alcoholic drinks during one regular week from the previous 12 months (non-drinkers: 0 g/day of alcohol; moderate drinker: ≥1 g/day of alcohol and not being a risky drinker; risky drinker: regular intake per day of ≥40 g in males and ≥ 24 g in females). Another independent variable was the self-reported current SHS exposure at home, measured as hours per day (never or almost never; <1 hour/day; 1-5 hours/day; >5 hours/day). We recoded this variable in two categories (no exposure: never or almost never; exposed: <1 hour/day; 1-5 hours/day; >5 hours/day). The ENSE survey also included self-reported SHS exposure in enclosed public places, on transportation, and in the workplace.

2.3. Data analysis

We computed the prevalence (%) of a GHQ score≥3 according to socio-demographic variables, SHS exposure at home, and health related variables. We also calculated the odds ratios (OR) and their 95% confidence intervals (CI) for a GHQ score≥3 by means of unconditional multiple logistic regression models, adjusted for sex and age. We used the individual weights to obtain a representative sample of the results at the national level, since the sample has a complex design to be representative of each Spanish

region. All analyses were carried out using SPSS Statistics v.20.0 (SPSS Inc, Chicago IL, USA) and STATA v.11 (STATA Corp., Texas, USA).

3. RESULTS

Among all never-smokers (n=11,214), 61.8% were women and the average age was 47.9 (SD= 20.77) years; 49.1% were in the socio-economic group V-VI (32.6% in the III-IV groups and 18.3% in the I-II groups); and 52.1% were married. Health was perceived as good or very good in 71.1% of the sample (20.6% as fair and 8.3% as poor or very poor), 43.2% reported having a chronic-long term disease, and 0.7% were risky drinkers (64.9% non-drinkers and 34.4% moderate drinkers). Of the respondents, 9.7% (n=1,090) were exposed to SHS at home. Exposure to SHS in enclosed public places and on transportation was 1.8% (n=193) and 1.4% (n=59) in the workplace. Table 1 shows the prevalence and OR of a GHQ score≥3 according to socio-demographic variables, SHS exposure at home, health related variables, and alcohol intake. The prevalence of a GHQ score≥3 was higher among females (OR: 1.70; 95% CI: 1.52-1.89), older people (≥65 years old; OR: 2.11; 95% CI: 1.85-2.42), people with poor or very poor perceived health (OR: 12.76; 95% CI: 10.76-15.14), and those having any chronic/long-term disease (OR: 2.61; 95% CI: 2.34-2.91). Also, the prevalence of a GHQ score≥3 was higher among people exposed to SHS at home (22.7%) compared with those non-exposed (18.9%), with an OR of 1.39 (95% CI: 1.19-1.62).

Table 1. Prevalence of never-smokers with psychological distress (GHQ score ≥3) and the corresponding OR* and 95% CI according to selected socio-demographic variables, second-hand exposure (SHS) at home, and health related variables.

	All (n)	With psychological distress (%)	OR [95%CI]*
All	11020	19.3	-
SHS exposure at home			
No	9948	18.9	1
Yes	1070	22.7	1.39 [1.19-1.62]
Sex			
Male	4233	13.5	1
Female	6786	22.9	1.70 [1.52-1.89]
Age (years)			
15 – 34	3519	12.6	1
35 – 49	2748	18.5	1.54 [1.34-1.78]
50 – 64	1974	23.2	1.95 [1.68-2.25]
≥65	2779	25.7	2.11 [1.85-2.42]
Marital status			
Married	5780	19.6	1
Single/never married	3722	14.2	1.01 [0.88-1.16]
Widowed/separated/divorced	1505	30.6	1.49 [1.30-1.71]
Socio-economic status			
Groups I - II	1952	14.5	1
Groups III - IV	3477	18.1	1.25 [1.07-1.46]
Groups V - VI	5204	21.8	1.53 [1.32-1.77]
Perceived general health			
Very good/Good	7907	11.1	1
Fair	2253	32.5	3.97 [3.50-4.49]
Poor/Very poor	860	59.7	12.76 [10.76-15.14]
Any chronic/long-term disease			
No	6304	12.0	1
Yes	4711	29.1	2.61 [2.34-2.91]
Alcohol intake**			
Non-drinker	7047	21.6	1
Moderate drinker	3799	15.3	0.76 [0.68-0.85]
Risky drinker	73	13.7	0.61 [0.31-1.20]

Data available from 11,020 respondents.
The values do not add up to the total due to some missing data.
*Odds ratios (and 95% CI) derived from multiple logistic regression models adjusted for sex and age.
**Non-drinker: 0 g/day of alcohol; moderate drinker: ≥1 g/day of alcohol and not being a risky drinker; risky drinker: regular intake per day of ≥40 g in males and ≥ 24 g in females.

The prevalence of a GHQ score≥3 was usually higher among those exposed to SHS at home according to most covariates (see stratified analysis in Table 2). The differences were statistically significant for both males and females and for respondents with and without chronic/long-term diseases. According to the socio-economic status, the prevalence of a GHQ score≥3 was significant for all groups except for the most advantaged (group I-II). For perceived general health, the differences were only significant for those with good and very good perceived health.

Table 2. Prevalence of never-smokers with psychological distress (GHQ≥3) and corresponding OR* and 95% CI according to second-hand exposure (SHS) at home and selected covariates.

	Never-smokers with psychological distress		
	Not exposed to SHS, n (%)	Exposed to SHS, n (%)	OR [95%CI]
All	1882 (18.9)	243 (22.7)	1.39 [1.19-1.62]
Sex			
Male	518 (13.4)	55 (15.3)	1.37 [1.01-1.88]
Female	1364 (22.4)	188 (26.5)	1.38 [1.15-1.66]
Age (years)			
15 – 34	367 (12.3)	78 (14.8)	1.24 [0.95-1.61]
35 – 49	462 (18.1)	46 (23.7)	1.34 [0.95-1.90]
50 – 64	391 (22.0)	67 (34.7)	1.70 [1.24-2.35]
≥65	662 (25.2)	52 (33.3)	1.35 [0.95-1.90]
Marital status			
Married	1017 (19.0)	115 (26.7)	1.45 [1.15-1.82]
Single/never married	444 (13.9)	86 (16.3)	1.36 [1.05-1.76]
Widowed/separated/divorced	419 (30.1)	42 (37.8)	1.45 [0.97-2.18]
Socio-economic status			
Group I -II	264 (14.7)	20 (13.2)	0.97 [0.59-1.61]
Group III - IV	562 (17.8)	69 (21.4)	1.40 [1.05-1.87]
Group V - VI	989 (21.3)	146 (26.3)	1.43 [1.16-1.76]
Perceived general health			
Very good/Good	775 (10.9)	103 (13.3)	1.29 [1.03-1.61]
Fair	650 (31.9)	83 (39.0)	1.21 [0.90-1.63]
Poor/Very poor	456 (58.8)	56 (67.5)	1.47 [0.90-2.42]
Any chronic/long-term disease			
No	658 (11.6)	96 (15.0)	1.38 [1.09-1.75]
Yes	1222 (28.5)	147 (34.3)	1.31 [1.06-1.63]
Alcohol intake			
Non-drinker	1351 (21.3)	170 (24.3)	1.32 [1.10-1.60]
Moderate drinker	510 (14.8)	70 (20.3)	1.50 [1.12-2.00]
Risky drinker	8 (13.1)	2 (16.7)	0.63 [0.09-4.41]

Data available from 11,018 respondents.
The values do not add up to the total due to some missing data.
*Odds ratios (and 95% CI) of respondents exposed to SHS compared with those not exposed, derived from multiple logistic regression models adjusted for sex and age.
**Non-drinkers: 0 g/day of alcohol; moderate drinker: ≥1 g/day of alcohol and not being a risky drinker; risky drinker: regular intake per day of ≥40 g in males and ≥ 24 g in females.

4. DISCUSSION

Our results show that SHS exposure is associated with psychological distress, even after stratifying the results for several socio-demographic and health related variables. Nevertheless, this association is of less magnitude than other variables studied, including poor general health, chronic diseases, or advanced age.

Our data are in agreement with the little evidence currently available on this subject (Asbridge, Ralph, & Stewart, 2013; Bandiera et al., 2010; Bandiera, Caban-Martínez et al., 2010; Hamer, Stamatakis, & Batty, 2010; Kiyohara, Itani, Kawamura, Matsumoto, & Takahashi, 2010; Nakata et al., 2008; Sobotova, Liu, Burakoff, Sevcikova, & Weitzman, 2011). The study of Hamer (2010), which also used the GHQ-12 to assess psychological distress, found robust dose-response associations even at low levels of SHS exposure. The longitudinal nature of that study provides some argument for a causal association.

In other studies focused on never-smokers, Bandiera et al. (2010) found an association between objectively measured SHS exposure and depressive symptoms and Asbridge et al. (2013) found that people exposed to SHS were more likely to report high stress. Nevertheless, we found this association both in people with and without chronic/long-term disease; whereas, Asbridge (2013) found this association only for those without a chronic/long-term disease.

To assess SHS exposure in our study, we only used exposure at home, as exposures in other public places, on transportation, and in the workplace are almost negligible in Spain (1% of the sample approximately), due to the current Spanish smoking regulations (Fernández & Nebot, 2011). In addition, two studies with children and

adolescents found that mental distress was associated with SHS exposure at home, but not with SHS exposure in public places (Hamer, Ford, Stamatakis, Dockray, & Batty, 2011; Padron, Galan, & Rodriguez-Artalejo, 2012).There is one study that did not find a link between SHS exposure and mental health problems (Lam, Kvaavik, Hamer, & Batty, 2013). Other explanations for this association may be that being exposed to SHS may be a proxy to stressful living. A healthy lifestyle has been associated with greater psychological well-being (Rejeski & Mihalko, 2001) and less anxiety and depression symptoms (De Moor, Beem, Stubbe, Boomsma, & De Geus, 2006; Dunn, Trivedi, Kampert, Clark, & Chambliss, 2005). Higher levels of restriction on smoking at home have been associated with a healthier lifestyle and less cigarette smoking, which in turn were associated with better psychological functioning (Pahl, Brook, Koppel, & Lee, 2011). Also, living with smokers may have an impact on psychological distress, as smoking has been associated with higher rates of mental disorders (Lasser et al., 2000).

The results of this study must be interpreted with caution due to some limitations. First, the data were based on self-reports; however, self-reported SHS exposure in adults and adolescents has shown an acceptable correlation with biomarkers of exposure (Fu et al., 2009; Johnson-Kozlow et al., 2010; Martínez-Sánchez et al., 2009; Okoli, Kelly, & Hahn, 2007). Second, because of the cross-sectional design of the study, no causal relationships can be inferred between SHS exposure and psychological distress. Third, non-participation and substitutions could be a source of selection bias, if participation was related to the conditions under study. However, participation and substitution rates were within the conventional limits in Health Interview Surveys, and it is unlikely that participation in such a general purpose survey could be linked to SHS exposure or psychological distress. Fourth, we had no information on past exposure to SHS.

Smoking in the home may have changed over time, and exposure to SHS in early childhood and adolescence may influence mental health (Padrón et al., 2015). Finally, other variables not studied here might act as potential confounders, for example, a family history of mental health disorders

The strengths of this study include the nationally representative sample of the Spanish population, and that this is the first study of an adult population, to our knowledge, to explore this association in a southern country of Europe, where the smoking prevalence in the general population is relatively high. Other strengths include the relatively high participation rate, the validity of the GHQ-12 measure, and that we were able to take into account multiple covariates, including sex, age, marital status, socio-economic status, perceived general health, presence of any chronic/long-term disease, and alcohol intake.

In conclusion, SHS exposure at home is negatively associated with psychological distress in an adult population. In countries with comprehensive smoke-free policies, homes are the main source of exposure for the general population (Martínez-Sánchez et al., 2009). Therefore, it is important to design and implement interventions targeting SHS exposure at home.

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5. DISCUSSIÓ CONJUNTA

Els resultats d'aquesta tesi indiquen la necessitat d'augmentar les estratègies de control del tabaquisme en l'àmbit de la salut mental hospitalària i de considerar-les com a prioritàries dins la cura global dels pacients amb trastorns mentals. Aquests resultats són similars als trobats en els pocs estudis que han avaluat aquestes estratègies en d'altres països en els que també s'han trobat baixos nivells d'intervenció, de disponibilitat de fàrmacs per deixar de fumar i de formació dels professionals (64,69).

Concretament, el nivell d'intervenció a Catalunya sobre el consum de tabac d'aquests pacients és encara insuficient i només s'oferia a la meitat dels dispositius avaluats; a més encara és poc freqüent el seguiment a l'àmbit ambulatori d'aquestes intervencions realitzades durant l'hospitalització (70). Així mateix, segons les dades obtingudes, escassament un terç dels serveis tenia disponibles fàrmacs per a la cessació tabàquica durant el període després de la primera llei estatal sobre tabaquisme que permetia fumar en els interiors i exteriors de les unitats de salut mental (llei 28/2005). Això podria ser indicatiu de que aquests tractaments no eren percebuts com un recurs bàsic en aquests entorns i que se'n podia prescindir d'ells.

La intervenció en tabaquisme en l'àmbit de la salut mental no és possible sense una bona preparació i formació dels professionals que treballen en aquests serveis. En el nostre estudi la meitat dels caps dels dispositius avaluats afirmava que els professionals de la seva unitat no tenien suficient formació per portar a terme intervencions per a la cessació tabàquica. De fet, a Espanya els plans d'estudis universitaris de medicina, psicologia i infermeria, per esmentar les professions sanitàries més directament vinculades amb la deshabituació tabàquica, no inclouen un temari específic sobre tabaquisme (71).

En general, els centres de dia van mostrar els nivells de control del tabaquisme més baixos. Aquests serveis promouen la rehabilitació psicosocial i l'atenció de la salut personal. Els pacients ingressats en aquests serveis es troben estables del seu trastorn mental i normalment es mantenen en aquestes unitats a diari durant llargs períodes de temps. Per aquests motius, l'assistència a un centre de dia suposaria una oportunitat clau per iniciar intervencions per deixar de fumar que ara es desaprofita. En aquest mateix sentit, seria necessari dissenyar intervencions *ad hoc* per a aquest àmbit, per tal d'avaluar l'eficàcia del tractament psicològic i farmacològic en termes de reducció de consum i cessació tabàquica avaluats a l'any. Per a aquesta fi, la Xarxa Catalana d'Hospitals sense Fum ha iniciat a finals del 2013 un programa amb l'objectiu d'incentivar la continuïtat de la intervenció en tabaquisme que es fa durant l'ingrés hospitalari un cop el pacient es dóna d'alta. D'aquesta manera es pretén establir nous circuïts d'intervenció entre l'hospital i els serveis ambulatoris (CSMA, CAS, hospitals de dia o centres de dia).

Un dels aspectes essencials de les estratègies de control del tabaquisme són les polítiques d'espais lliures de fum. A la major part de països del món encara és molt habitual que els pacients de dispositius hospitalaris puguin fumar en els interiors i en els exteriors de les unitats (20,21). Fins i tot en els països on s'han desplegat polítiques lliures de fum en espais públics i de treball, com ara Irlanda, el Regne Unit, els EUA o Austràlia, les unitats de salut mental queden habitualment exemptes o són sovint polítiques voluntàries (64,69). No obstant, la implementació d'aquestes polítiques de prohibició total de fumar en interiors i exteriors dels dispositius de salut mental no serà possible o fracassarà si no s'aborden i es milloren els aspectes anteriorment esmentats (intervenció, recursos i formació). Així, les estratègies per deixar de fumar són un

component crític en la implementació de les polítiques lliures de fum en els hospitals, amb una interrelació entre elles que fan que part del seu èxit en depenguin mútuament (68).

Respecte al control del fum ambiental del tabac als dispositius de salut mental, l'OMS posa un llindar màxim d'exposició a les $PM_{2.5}$ per a espais exteriors (no existeixen per a espais interiors) de 10 $\mu g/m^3$ per a exposicions a llarg termini (72). En concret, aquest és el nivell més baix amb el qual s'ha demostrat, amb més del 95% de confiança, que la mortalitat total, cardiopulmonar total i per càncer de pulmó augmenta en resposta a l'exposició perllongada a les $PM_{2.5}$ (72). A l'interior de les unitats amb espais per fumar hem detectat en els espais comuns de dos a cinc vegades els nivells màxims recomanats per l'OMS, i val a dir que 25 i 35 $\mu g/m^3$ de $PM_{2.5}$ estan associats amb un 9% i un 15% d'augment en el risc de mortalitat prematura, respectivament. Així doncs, aquests resultats poden ajudar a decidir el tipus de normativa d'espais lliures de fum a implementar, perquè mostren el potencial risc per a la salut que s'assumeix amb l'adopció de cada tipus de normativa i la responsabilitat adquirida. L'adopció de polítiques lliures de fum en aquestes unitats contribueix a desnormalitzar-hi el tabaquisme i a no discriminar les unitats de salut mental enfront les altres unitats d'altres especialitats.

Una de les barreres a l'hora d'implementar les normatives de prohibició total de fumar en aquestes unitats pot ser les percepcions dels professionals. Així, una gran proporció de professionals objectivament exposats al fum ambiental del tabac declaraven no estar en absolut exposats i per tant, no tenien percepció de treballar en un ambient potencialment perjudicial per a la seva salut. Les infermeres percebien la unitat com a molt o bastant contaminada de fum del tabac amb més freqüència que els metges, que

subestimaven significativament els nivells de fum ambiental respecte les anteriors i, per tant, els potencials efectes nocius per a la salut de treballar a la unitat. Això podria ser degut a que les infermeres passen un temps més llarg a les unitats que els metges. Tot i això, no hi havia diferència en la preferència pels tipus de prohibicions de fumar. Aquest fet podria explicar-se perquè les infermeres han de controlar el comportament del pacient diàriament i podrien percebre un efecte negatiu en el comportament dels pacients en no permetre'ls fumar (73,74), malgrat que ha estat repetidament demostrat que això no és així (64).

La major part dels professionals i pacients es van decantar per unitats en les que no es permet fumar en els interiors però sí en els exteriors, com també s'ha trobat en d'altres països (67,75,76). Pocs estudis a nivell internacional han explorat el suport dels professionals a les polítiques lliures de fum totals, en les que no es fuma ni en interiors ni en exteriors. En el nostre estudi només un terç dels professionals estaven molt o bastant d'acord amb les prohibicions totals de fumar, independentment de la seva condició de fumador o no, o de la professió, a diferència d'altres estudis en d'altres països on es detectaven majors nivells d'acceptació (73,77,78).

L'actual llei del tabac (llei 42/2010) en vigor des del 2011 no permet fumar en els dispositius de salut mental ni en els interiors ni en els exteriors (79), amb excepció de les unitats de mitjana i llarga estada. Possiblement després de més de tres anys d'implantació d'aquesta llei l'acceptació cap a aquesta pugui haver augmentat, ja que les dades per a aquest estudi es van recollir durant l'any 2010 i principis del 2011. Alguns estudis en d'altres països han mostrat que l'acceptació cap a les prohibicions totals de fumar augmenta després de la seva posada en pràctica (68,80), fet que podria comprovar-se en el nostre territori a través d'un nou estudi.

Degut a la infravaloració del nivell de fum ambiental del tabac en aquestes unitats per part dels professionals, és important informar-los del nivell de fum ambiental de la unitat on treballen i dels beneficis de les prohibicions totals de fumar, ja que s'ha descrit com un component clau en la sostenibilitat d'aquest tipus de prohibicions (81). La falsa percepció de seguretat en la protecció enfront al fum ambiental del tabac a les unitats on només es permet fumar als exteriors podria explicar la preferència dels professionals per aquestes normatives. S'ha de tenir en compte, però, que el fum que prové de zones exteriors properes a les entrades dels edificis pot entrar a les àrees interiors immediatament adjacents, com els vestíbuls, fent inefectiva la normativa lliure de fum als interiors (82).

El fum ambiental del tabac pot empitjorar l'estat de salut basal dels pacients quan ingressen pel fet de que hi poden passar llargues temporades de temps. Tot i això, el fum ambiental del tabac també pot tenir un impacte en els pacients ingressats en unitats de curta estada, ja que s'han mostrat efectes nocius fins i tot quan el temps d'exposició és curt. Per exemple, l'exposició al fum del tabac durant 30 minuts pot causar disfunció endotelial en la circulació coronària dels no fumadors (83). Els efectes nocius del fum ambiental del tabac s'han demostrat en la població general, però aquests efectes podrien tenir un impacte més gran en aquests pacients a causa de la pobra salut que habitualment pateix aquesta població (55). A més a més, comença a haver evidències de que el fum ambiental del tabac també podria afectar al malestar psicològic, tal com també se suggereix en l'últim estudi d'aquesta tesi, fins i tot després d'ajustar i estratificar els resultats per diverses variables sociodemogràfiques i de salut. L'escassa evidència disponible fins al moment actual mostra resultats similars (84-90). L'estudi de Hamer (2010) (87) va trobar associacions dosi-resposta robustes, fins i tot a baixos

nivells d'exposició al fum ambiental i la naturalesa longitudinal d'aquest estudi proporciona un argument per a una associació causal.

En cas d'associació causal s'han proposat diverses hipòtesis, tot i que la possible explicació no queda clara. La nicotina pot imitar els efectes fisiològics de l'ansietat mitjançant l'augment de la pressió arterial i la freqüència cardíaca (84). D'altra banda, el fum ambiental el tabac podria activar mecanismes neurobiològics que impliquessin vies nervioses a través del sistema de la dopamina, tal com s'ha provat en estudis amb animals (91). Bandiera (2011) (92) va hipotetitzar que l'exposició a llarg termini al fum ambiental del tabac podria conduir a una disminució de la disponibilitat del receptor de la dopamina, tal i com succeeix amb els fumadors actius. Altres explicacions per a aquesta associació poden estar relacionades amb el fet que l'exposició al fum del tabac pot ser un indicador de tenir una vida estressant, i de fet, un estil de vida saludable s'ha associat amb un major benestar psicològic (93) i amb menys probabilitats d'experimentar ansietat i símptomes de depressió (94,95). Si es confirmés aquesta associació entre exposició al fum ambiental del tabac i malestar psicològic es podria suposar que l'ambient de les unitats de mitjana i llarga estada on encara es permet fumar als interiors no estarien proporcionant un ambient propici per a la recuperació del benestar psicològic dels pacients.

Els espais lliures de fum, juntament amb les intervencions per deixar de fumar a les unitats hospitalàries de salut mental, són un aspecte essencial en la millora de la qualitat de vida i l'esperança de vida en aquesta població. S'han de prioritzar les mesures que previnguin les desigualtats i igualin el dret a la salut i la cura d'aquests pacients a la resta de població general.

Les estratègies dels plans d'atenció a la salut mental van cada cop més encaminades a la cura per igual dels aspectes psíquics com físics i de qualitat de vida d'aquests pacients, entenent que no hi ha salut psíquica sense salut física (96).

Principals fortaleses i limitacions d'aquesta investigació

Limitacions

Una de les potencials limitacions d'aquesta investigació la trobem en l'ús de diferents qüestionaris que poden donar resultats esbiaixats. En el cas del primer estudi als caps d'unitats sobre la implantació de mesures de control del tabaquisme, hi podria haver un cert biaix cap a respostes positives cap a la pròpia unitat, tot i que els baixos nivells reportats de control del tabaquisme no farien pensar en un gran efecte d'aquest potencial biaix. En el quart estudi, que utilitza la Encuesta Nacional de Salud de España, la variable exposició al fum ambiental del tabac també és autoreportada, tot i que l'exposició al FAT mesurada mitjançant biomarcadors ha mostrat una correlació acceptable amb la percepció subjectiva de FAT en adults i adolescents (97,98).

A l'hora d'incloure els serveis de salut mental hospitalària als estudis d'aquesta tesi només es varen tenir en compte aquells hospitals o institucions públics o privats que donen servei al Sistema Nacional de Salut, i per tant no s'han tingut en compte els centres privats amb ingrés hospitalari en salut mental. Malgrat aquest potencial biaix de selecció, aquests centres privats a Catalunya són escassos i és molt poc probable que aquesta exclusió hagi tingut un impacte significatiu sobre els resultats obtinguts.

Respecte al marcador utilitzat per a la mesura objectiva del FAT, val a dir que les $PM_{2.5}$ no són un marcador 100% específic del fum del tabac. Així doncs, les $PM_{2.5}$ poden ser produïdes per qualsevol font de combustió. No obstant, en espais interiors aquest mètode obté resultats similars als que s'obtenen mitjançant l'ús de les concentracions de nicotina en l'aire, un marcador específic del FAT. Així, les correlacions entre aquestes dues mesures van des de 0,64 a 0,98; com s'ha pogut constatar en d'altres estudis (28,29). De fet, la concentració de $PM_{2.5}$ és un mètode àmpliament utilitzat per a avaluar el FAT en espais interiors en absència d'altres fonts de combustió (28,29,99), amb resultats fiables obtinguts tant en espais amb baixes concentracions com en altres concentracions de $PM_{2.5}$ (28,29).

Per a l'últim estudi en que s'analitza la variable d'exposició passiva al FAT a través de la Encuesta Nacional de Salud de España només s'utilitza la dada d'exposició passiva a les llars, excloent altres fonts o espais d'exposició. Aquesta elecció ve donada pel fet que només un 1% de la població a Espanya, aproximadament, està exposada al FAT en llocs de treball o transports públics, segons dades de la mateixa enquesta, fruit de l'actual llei del tabaquisme (79). Respecte al mateix estudi, pel disseny transversal del mateix, no es poden realitzar inferències causals entre l'exposició al FAT i el malestar psicològic, així com tampoc no es pot descartar l'efecte d'altres variables no estudiades en aquest treball.

Fortaleses

Una de les principals fortaleses d'aquesta investigació recau en la novetat dels resultats extrets, tant a nivell nacional com internacional, tot aportant dades sobre un tema poc estudiat.

D’altra banda, una altra fortalesa de tots els estudis presentats és l’alta representativitat de les mostres. Així, en el primer estudi es va aconseguir una taxa de resposta al qüestionari del 96,9% de tots els caps d’unitats de salut mental hospitalària i centres de dia de Catalunya. Així mateix, quant a les mesures del FAT mitjançant les $PM_{2.5}$, es va aconseguir mesurar el 95,5% de totes les unitats d’ingrés hospitalari en salut mental de Catalunya. Dels qüestionaris als professionals i pacients d’aquestes unitats s’obtenen unes taxes de resposta del 80,1% i el 27,7% de tots els professionals i pacients, respectivament, disponibles durant el dia de mostreig amb les $PM_{2.5}$. Per a l’últim estudi, la Encuesta Nacional de Salud de España aporta dades d’una mostra representativa de tota la població espanyola, amb una n total de 21.007 adults.

Finalment, dir que fruit dels resultats obtingut en aquests treballs s’han elaborat una sèrie de documents d’intervenció en tabaquisme específics per a pacients amb trastorns mentals (inclosos als annexos 3, 4 i 5), que ajudaran als professionals sanitaris en la seva pràctica habitual en aquest context.

6. CONCLUSIONS

- Els nivells d'implementació d'estratègies de control del tabaquisme en les unitats hospitalàries de salut mental de Catalunya són en general baixos, principalment respecte al nivell d'intervenció clínica sobre el consum de tabac dels pacients i la formació dels professionals en intervenció per deixar de fumar.

- Només les unitats amb normatives de no permetre fumar ni als interiors ni exteriors de les unitats d'ingrés asseguren una protecció efectiva enfront el FAT, segons els estàndards recomanats per l'OMS.

- Les normatives parcials d'espais lliures de fum a les unitats d'ingrés (p. ex. permetre fumar als exteriors o als interiors) propicien nivells de FAT potencialment perjudicials per als pacients i els professionals que hi treballen.

- Els pacients i professionals de les unitats de salut mental estan poc d'acord amb les normatives de no permetre fumar ni en els interiors ni en els exteriors. Això podria estar influenciat per la percepció errònia i infravalorada dels nivells de FAT a les unitats.

- L'exposició perllongada al FAT pot potenciar el malestar psicològic en persones mai fumadores.

6.1. Implicacions en l'àmbit de la salut mental

Els resultats d'aquesta tesi mostren la necessitat de potenciar estratègies de control del tabaquisme a les unitats d'ingrés hospitalari de Catalunya. Una de les principals àrees a potenciar està relacionada amb la sensibilització i formació dels professionals en intervenció per deixar de fumar en els seus pacients. En aquest aspecte cal oferir oportunitats de formació per a tots els professionals a càrrec de pacients sigui quina sigui la seva professió. Augmentar la formació és clau per poder augmentar el nivell d'intervenció i assegurar circuits d'intervenció efectius des de l'àmbit hospitalari a l'àmbit ambulatori.

L'estudi dels nivells de fum ambiental a les unitats d'ingrés de salut mental té implicacions a l'hora de formular polítiques de control del tabaquisme a nivell nacional i internacional. A nivell internacional encara és habitual que es permeti fumar en els interiors dels dispositius de salut mental. Fins i tot en els països que tenen polítiques de control més avançades de vegades es permet als pacients d'aquestes unitats fumar als exteriors o inclús en interiors, al contrari del que passa en unitats d'altres especialitats. A nivell nacional, la llei actual encara permet a les unitats de mitjana i llarga estada deixar fumar als pacients a l'interior de les unitats, on els nivells de fum ambiental del tabac poden arribar a ser molt alts i perjudicials per a la salut. El coneixement dels nivells de fum ambiental del tabac segons el tipus de normativa que s'implanti aporta un nivell de responsabilitat a l'organisme que permeti normatives que puguin ser perjudicials pels pacients i que vagin en contra de les lleis de seguretat laboral dels professionals.

És important que els professionals coneguin els nivells de fum ambiental del tabac que s'acumulen en les unitats on treballen i els seus efectes perjudicials sobre la seva salut i

la dels pacients, tant a nivell físic com psicològic. Aquest coneixement és clau a fi de sensibilitzar els professionals de la necessitat d'implantar normatives totals d'espais lliures de fum. Fumar als exteriors de les unitats o en cambres interiors especials comporta una falsa sensació de seguretat enfront al fum ambiental del tabac en professionals i pacients.

6.2. Línies d'investigació futures

Els treballs d'aquesta tesi aporten dades des de l'any 2009 al 2011 pel que aquesta descripció de la situació pot ser diferent de la que pugui existir actualment a l'any 2014. Un factor clau d'aquest possible canvi és l'aplicació de la nova llei de control del tabac (llei 42/2010) que prohibeix fumar als interiors i exteriors de les unitats de salut mental, exceptuant les unitats de mitjana i llarga estada. Aquesta nova llei podria haver incentivat l'inici de programes d'atenció al consum de tabac dels pacients, la destinació de recursos per a aquesta fi i la formació dels professionals per a l'aplicació d'aquests programes, paral·lelament a les activitats de la Xarxa Catalana d'Hospitals sense Fum (XCHsF) en aquest àmbit. Per tot això seria interessant poder replicar els estudis cinc/deu anys després a fi de fer un seguiment en l'evolució de les estratègies de control del tabaquisme.

En la mateixa línia de treball de la XCHsF dins els dispositius de salut mental hospitalaris, seria important dissenyar un programa específic per a les unitats de mitjana i llarga estada amb l'objectiu d'augmentar el control del tabaquisme en aquestes unitats aplicant els estàndards de la XCHsF. Concretament, seria important eliminar els espais interiors per fumar de les unitats, la formació dels professionals i la sensibilització

progressiva dels pacients cap a la importància de deixar de fumar o de no contaminar els espais interiors amb fum de tabac.

Altres línies de treball importants estarien relacionades amb els efectes de l'exposició al fum ambiental del tabac en els pacients ingressats en unitats de salut mental de mitjana i llarga estada on encara es permet fumar en els interiors de les unitats. En aquests dispositius, els pacients passen per llargs períodes d'exposició al fum ambiental del tabac i habitualment també presenten un pobre estat de salut. En aquesta situació seria interessant avaluar diferents variables físiques, psicològiques i de despesa farmacèutica de pacients en unitats amb alts nivells de fum ambiental del tabac i comparar-les amb les d'altres pacients en unitats lliures de fum.

Finalment, una altra línia d'investigació, si bé no derivada directament dels estudis d'aquesta tesi, estaria relacionada amb l'ús de les cigarretes electròniques per part dels pacients amb trastorns mentals i avaluar el seu patró d'ús, l'efectivitat per deixar de fumar, la seguretat del seu ús per part d'aquests pacients i l'avaluació de la cigarreta electrònica com a estratègia de reducció de danys i l'avaluació de variables fisiològiques com la capacitat pulmonar o tensió arterial.

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8. ANNEXOS

Annex 1

Article: **Por el humo se sabe dónde está el fuego. El abordaje del tabaquismo en los servicios de Salud Mental y Adicciones**

Antoni Gual, Montse Ballbè

Opiniones en psiquiatria; 2011; 2: 31-34.

Por el humo se sabe dónde está el fuego

El abordaje del tabaquismo en los servicios de Salud Mental y Adicciones

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La prevalencia de consumo de tabaco entre los pacientes con trastornos mentales, así como la severidad de su dependencia, es más elevada que en la población general. Pese a ello, en el ámbito de la salud mental se ha mantenido, tradicionalmente, una cierta actitud permisiva con dicho consumo, que ha permanecido como una norma cultural aceptable para estos pacientes. De ahí que, en general, todavía hoy se intervenga poco sobre este consumo y falte formación al respecto. Por otra parte, la ley del tabaco continúa permitiendo fumar en áreas interiores de los servicios de Salud Mental y Adicciones, aunque con restricciones cada vez mayores. Toda esta realidad, no exenta de negligencia, comporta altas tasas de morbilidad y mortalidad asociadas al tabaco. Los individuos con trastorno mental grave fallecen una media de 25-30 años antes que la población general, siendo el tabaco uno de los factores determinantes de esta mortalidad prematura.

Intervenir en el consumo de tabaco de estos pacientes es una de las tareas más relevantes que el clínico puede desempeñar en cuanto a supervivencia, calidad de vida y coste-eficacia de la intervención.

Introducción

Durante mucho tiempo, el fumar se ha asociado a la sofisticación, al estilo, a la modernidad, al progreso e incluso a la libertad. Actualmente, como si de una rápida moda se tratara, esta asimilación aparece totalmente desfasada, por cuanto ha sido desbancada por otros valores relacionados con la vida saludable: ejercicio físico, dieta equilibrada, etc. Este hecho, junto a las progresivas evidencias de perjuicio para la salud del tabaco, ha propiciado que la antigua percepción del fumar haya dado un giro de 180º.

Paralelamente a la evolución de esta tendencia cultural, la ley española sobre el tabaquismo ha ido avanzando progresivamente. De hecho en el momento de terminar este artículo acaba de entrar en vigor la modificación de la Ley 28/2005 de medidas sanitarias frente al tabaquismo, que supone un paso más en la prevención de la exposición al humo del tabaco. Dicah modificación, amplia las restricciones en los ámbitos hospitalarios, pero sigue permitiendo la excepcionalidad en el caso de las unidades psiquiátricas de hospitalización.

¿Qué supone el tabaquismo en el ámbito de la Salud Mental y Adicciones?

La prevalencia de consumo de tabaco en la población general mantiene una tendencia a la disminución desde hace más de una década. No obstante, existen poblaciones en la que esta tendencia no se percibe tan claramente.

Ya en los años 80 la literatura científica empezó a alertar sobre la alta prevalencia de consumo de tabaco en los pacientes con trastornos mentales. Dicha prevalencia es significativamente más elevada que la de la población general, alcanzando de un 40% a un 80% según diferentes trastornos. Los trastornos mentales con mayor prevalencia de consumo de tabaco son la esquizofrenia y las adicciones, seguidos por el trastorno de ansiedad generalizada y los trastornos del estado de ánimo. Las posibles explicaciones a este hecho incluyen conjuntamente factores biológicos, sociales y psicológicos. Además, en estos pacientes, que muchas veces cuentan con bajos ingresos, la alta dependencia del tabaco comporta un elevado gasto económico, que se ha estimado en un 27% de sus ingresos.

La consecuencia dramática de esta elevada prevalencia, unida al mayor número de cigarrillos fumados por día y a la mayor gravedad de la dependencia, es una alta mortalidad y morbilidad por enfermedades causadas o relacionadas con el tabaco. La morbilidad de los trastornos mentales graves conlleva una creciente demanda de servicios por parte del sistema sanitario y supone ya uno de los principales problemas de salud pública. Resulta alarmante, además, el hecho de que los pacientes con trastorno mental grave fallezcan una media de 25 a 30 años antes que la población general, precisamente por causas relacionadas con el tabaco en su mayoria.

A modo ilustrativo, en un estudio longitudinal a 20 años realizado en nuestra unidad de alcohología, actualmente ya concluido, se efectuó el seguimiento de una cohorte de 850 pacientes con dependencia del alcohol[1]. En estos pacientes la prevalencia de consumo de tabaco puede alcanzar hasta un 80%, con niveles de dependencia habitualmente altos. Los datos indicaron que en nuestra cohorte la mortalidad a los 10 años fue del 15,8% y que el cáncer fue el responsable del 34% de las muertes, siendo los más frecuentes los del tracto digestivo / respiratorio. En la submuestra de pacientes no fumadores la primera causa de muerte fue la cirrosis hepática. Estos resultados fueron reveladores y contribuyeron en su día a que incluyéramos sistemáticamente la atención al consumo de tabaco en el plan terapéutico de los pacientes con dependencia del alcohol, puesto que nuestros esfuerzos para lograr que éstos abandonaran el alcohol y el beneficio asociado a dicho abandono quedaban mermados por las consecuencias del consumo de tabaco.

¿Cómo abordamos este problema los profesionales?

Pese al elevado consumo de tabaco en nuestros pacientes y el gran impacto sobre la salud, el abordaje de esta dependencia no ha figurado históricamente como una de las prioridades en la práctica profesional de la psiquiatría y psicología.

Algunos estudios han examinado hasta qué punto se aborda el consumo de tabaco en las consultas ambulatorias y los dispositivos hospitalarios de psiquiatria, poniendo de manifiesto niveles insuficientes de intervención. En un estudio realizado en las consultas ambulatorias de salud mental en Estados Unidos aunque se detectaba el consumo de tabaco en el 75% de las visitas, tan sólo se ofrecía consejo antitabáquico en un 12% de éstas. No es sorprendente que esta población presente una media de intentos de cesación significativamente menor que la población general. En el ámbito de las adicciones, la situación resulta la misma y tradicionalmente se ha percibido el tabaquismo como una adicción menor, priorizando las consecuencias inmediatas del consumo de otras sustancias.

¿Qué razones podrían haber contribuido a un abordaje insuficiente?

Creencias erróneas, mitos, mayor complejidad terapéutica en la cesación o la necesidad de formación de los profesionales podrían tener alguna influencia en la baja intervención detectada sobre el consumo de tabaco en esta población de pacientes. En las líneas que siguen revisaremos en detalle estos aspectos.

Mitos

Históricamente, la relación entre el tabaco y las personas que padecen trastornos mentales se ha visto envuelta en mitos y falsas creencias. Algunas de las más vigentes sostienen que estos pacientes no desean ni son capaces de dejar de fumar, o que el fumar es uno de los pocos placeres de los que pueden disfrutar y que hay que considerar dicho consumo como una decisión personal libre. Planteamientos que no parecen descabellados en el ideario tradicional del profesional de la salud mental, pero, ¿se ajustan realmente a la realidad?

En primer lugar, plantear el consumo de tabaco como "uno de los pocos placeres de los que pueden disfrutar" no deja de reflejar una actitud paternalista y condescendiente absolutamente injustificable. Sería sin duda interesante estudiar la reacción de pacientes y familiares si conocieran la importante disminución en su esperanza de vida a la que el tabaco contribuye decisivamente.

En nombre del placer y la "calidad de vida", también podríamos facilitar a nuestros pacientes dietas más sabrosas aunque ricas en grasas y azúcares para acabar con vino o digestivos. Si al final eso contribuye a que su esperanza de vida disminuya en unos años, algunos lo darían por bien empleado. Lamentablemente, las actitudes paternalistas que contribuyen a la estigmatización del paciente psiquiátrico siguen todavía muy vigentes, incluso en el ámbito profesional.

En segundo lugar, en cuanto a la idea de que dichos pacientes no están motivados para dejar de fumar, se han llevado a cabo diversos estudios con el objetivo de investigar su disposición real para dejar de fumar. Aunque en un primer momento pudiera sorprender, dichos trabajos aportan resultados similares y muestran una nada desdeñable proporción de pacientes que querría abandonar el tabaco. Efectivamente, se ha demostrado que la motivación para dejar de fumar en los individuos con trastornos mentales no difiere de la detectada en la población general. Incluso si la motivación fuera menor, en el tratamiento de las adicciones ya no se considera válida la opción de esperar a que el paciente "toque fondo" o esté motivado para intervenir, puesto que uno de los puntos clave de la intervención moderna en las adicciones empieza por el trabajo de motivación mediante técnicas y estrategias de probada eficacia científica, también en el consumo de tabaco.

Complejidad terapéutica

En cuanto a la proporción de pacientes con trastornos mentales que consigue dejar de fumar, se ha observado que ésta es menor que la de la población general. Asimismo, los cuadros de síndrome de abstinencia de la nicotina son más intensos y prolongados y el número de recaídas es mayor. Por todo ello, estos pacientes se beneficiarán de intervenciones para el abandono del consumo de tabaco más especializadas, intensivas, adaptadas a sus particularidades clínicas y con un seguimiento a largo plazo. Esta mayor complejidad de intervención comporta diversas decisiones terapéuticas que dependerán de diferentes factores como el diagnóstico psiquiátrico del paciente, su motivación para dejar de fumar, la estabilidad del trastorno mental y el tener en cuenta la posible afectación de la farmacocinética de ciertos psicofármacos que puede tener lugar ante la cesación del tabaco.

Concretamente en el campo de las adicciones, además, va ganando terreno la apuesta por tratar las diferentes adicciones simultáneamente, incluido el tabaquismo. Por ejemplo con la dependencia del alcohol se ha observado que, cuando el paciente lo solicita, la intervención en tabaquismo simultáneamente a la del alcohol no interfiere en el tratamiento de esta segunda sustancia.

Formación de los profesionales

Esta mayor complejidad en la intervención no justifica que no se lleve a cabo sino que, al contrario, debería motivarnos a superar las barreras. En este sentido algunos estudios corroboran la falta de formación de los profesionales sanitarios en intervención sobre el consumo de tabaco. Esta necesidad de formación incluye en la misma medida a los especialistas en salud mental y adicciones, quienes deberían poder ofrecer, además, intervenciones más especializadas e intensivas. Aún constando la dependencia del tabaco, como el resto de dependencias, en el DSM-IV-TR, los profesionales especialistas en salud mental, por lo general, reciben poca formación en el abordaje de esta adicción a lo largo de su curriculum universitario y de especialización.

Es difícil pensar que la baja frecuencia en el abordaje del tabaquismo en los pacientes con trastornos mentales y otras adicciones, los mitos y la falta de formación a la que nos hemos referido, no se reflejen en la propia actitud del profesional respecto al tabaco y viceversa. Así, los profesionales de la salud mental y adicciones presentan cifras de prevalencia de tabaquismo mayores que las de los profesionales de otras especialidades. Existe hoy en día una evidencia clara de que los propios hábitos de los profesionales (alcohol, tabaco, dieta, ejercicio físico, etc.) influyen notablemente en su praxis clínica. Algo importante sobre lo que debemos reflexionar.

Junto a todo ello, la legislación actual sobre el tabaco en España (Ley del 21 de diciembre del 2010 que modifica la Ley 28/2005) prohíbe fumar en todos los espacios públicos cerrados y lugares de trabajo, pero con unas pocas exenciones, como los centros de salud mental. En estos últimos se permite habilitar zonas para fumar para pacientes a quienes "por criterio médico se determine", aun cuando en el año 2005 España ratificó el Convenio Marco sobre el Control del Tabaco de la Organización Mundial de la Salud, en el que se incluye la obligación de proteger a las personas de la exposición al humo ambiental del tabaco (HAT). El HAT está clasificado como

carcinógeno de pulmón y se han demostrado asimismo otros efectos adversos especialmente en forma de cardiopatías y trastornos respiratorios.

A modo de fotografía del estado del control del tabaquismo, la Red Catalana de Hospitales sin Humo, a través de su grupo de trabajo de "Tabaco y Salud Mental" realizó un estudio en los dispositivos hospitalarios y centros de día de Cataluña públicos y concertados mediante una encuesta a los jefes de dispositivo (datos aún no publicados). Se consiguió que respondiera el 96,9% (n=186) de estos centros y los resultados no mostraron una situación precisamente alentadora. Sí se logró en todo caso identificar las áreas en las que centrar los esfuerzos del grupo de trabajo. Como se sugería anteriormente, menos de la mitad de los dispositivos intervenían en el consumo de tabaco de sus pacientes y aún menos eran los que disponían de fármacos para dicho propósito. Estos datos no deben sorprendernos si tenemos en cuenta el hecho de que sólo en la mitad de los dispositivos se refería que sus profesionales tenían suficiente conocimiento en intervención sobre el consumo de tabaco. Al contrario de lo que cabría suponer, los resultados de la encuesta indicaron que las cifras de baja formación de los especialistas no variaban en los dispositivos de desintoxicación y patología dual, ni tampoco era mayor el porcentaje de intervención sobre el consumo de tabaco. En cuanto al control de los espacios en los que se fuma, poco menos de la mitad de todos los dispositivos aún mantiene espacios interiores para fumar.

¿Qué se está haciendo para dar un giro a esta situación?

Aunque queda mucho terreno por avanzar, algunos cambios ya han ido tomando forma.

Como un ejemplo de este cambio, en las *Recomendaciones para la monitorización y promoción de la salud física en el paciente con esquizofrenia y otros trastornos mentales graves* (Proyecto Monitor) elaboradas recientemente por el Plan Director de Salud Mental de la Generalitat de Catalunya, se plasma ya un reconocimiento de la importancia de intervenir en el consumo de tabaco. De este modo, en este documento se incluye el tabaquismo como un aspecto importante a monitorizar e intervenir en estos pacientes a la luz del gran impacto que origina sobre su salud.

Asimismo, ya comentábamos anteriormente uno de los estudios realizados por el grupo de trabajo de Tabaco y Salud Mental de la Red Catalana de Hospitales sin Humo[2]. Este grupo, creado a finales del año 2007, reúne actualmente a 27 profesionales de la salud mental de 17 hospitales catalanes. Los primeros objetivos del grupo se centraron en conocer las principales necesidades a trabajar en cuanto el control del tabaquismo en los dispositivos hospitalarios de salud mental. Paralelamente, se consensuó una guía de buena práctica hospitalaria que sentara las bases o puntos principales para un buen abordaje del tabaquismo en estas unidades[3]. Posteriormente, la constatación de la poca formación de los profesionales en intervención sobre el consumo de tabaco en estos pacientes condujo a que actualmente se trabaje en una guía de intervención que aborde de manera clara y consensuada la complejidad de esta intervención.

¿Qué deberíamos hacer para seguir avanzando?

Teniendo en cuenta los aspectos comentados hasta este punto, sería necesario abordar este problema desde diferentes perspectivas.

Por una parte, es clave aumentar la formación específica en el tratamiento del tabaquismo, incluyéndola o potenciándola tanto dentro del curriculum en las facultades de medicina, psicología o enfermería, como posteriormente dentro de la formación para la especialización en salud mental.

Es necesario también que se incorpore sistemáticamente el abordaje de dicho consumo dentro del plan terapéutico de atención global a la salud del paciente. El consejo breve a todos los pacientes fumadores debería constituir un elemento básico en su atención, pudiéndose ofrecer intervenciones más intensivas y especializadas a los pacientes que lo precisen. Por otra parte, resulta esencial la disponibilidad de fármacos para la cesación tabáquica en los servicios hospitalarios de salud mental y abrir la posibilidad de subvenciones para la obtención de dichos fármacos para los pacientes ambulatorios más desfavorecidos. Como se comentaba anteriormente, la literatura científica disponible demuestra que los pacientes pueden estar motivados para dejar de fumar y pueden conseguirlo.

En cuanto al control de los espacios *sin humo* en los dispositivos de salud mental y adicciones, las intervenciones para el consumo de tabaco en estos dispositivos se han probado factibles. Igualmente se ha mostrado viable el hecho de convertir estos dispositivos totalmente *sin humo*, es decir, sin espacios reservados para fumar. Pese a ello, diferentes estudios consistentes en encuestas a trabajadores han puesto de manifiesto ciertas reticencias de este colectivo a la implantación de la prohibición sin exenciones de fumar en dichos dispositivos por el temor a que todo ello dé lugar a dificultades y problemas con el manejo de los pacientes. No obstante, después de su implantación, estos estudios también muestran que los mismos trabajadores consideran la prohibición total como beneficiosa, lográndose un mayor apoyo a estas políticas y, curiosamente, poniendo de manifiesto una proporción de incidencias menor a las anticipadas. A nivel asistencial, se ha demostrado que las prohibiciones totales no afectan significativamente al reclutamiento y a la retención de los pacientes y, tal y como los profesionales referían, tampoco dan lugar a un incremento en la frecuencia e intensidad de incidentes provocados por los pacientes.

Será importante, pues, un mayor apoyo de la ley a fin de eliminar las actuales exenciones. En Inglaterra o algunos estados de Estados Unidos la ley ya prohíbe totalmente fumar en los servicios de salud mental sin ningún tipo de excepción. La implementación de dicha ley se ha producido con resultados generales positivos y sin un incremento significativo de incidentes relacionados. Sin embargo, en Inglaterra o Australia, por ejemplo, pese a la implementación de prohibiciones totales, la frecuencia de intervención clínica y el nivel de formación de los profesionales en dicha intervención siguen constituyendo retos a trabajar.

Conclusiones

Pese a los cambios generales en la percepción del tabaco aún existe cierta miopía social frente a dicha sustancia, pero lo que resulta verdaderamente preocupante es que los especialistas en adicciones y el resto de profesionales de la salud mental también se vean afectados por dicha miopía. En general, el consumo de tabaco no se percibe como un aspecto prioritario dentro de las numerosas teclas a tocar en el abordaje del paciente psiquiátrico pero, una vez comprobado que este consumo es la primera causa de mortalidad y morbilidad, ¿qué deberíamos entender por prioritario?

La tendencia actual en las estrategias sanitarias de salud mental hacia la desestigmatización y normalización de estos pacientes dentro de la sociedad exige no dejar de lado el abordaje de esta grave problemática. El Libro Verde sobre Salud Mental de la Unión Europea aboga por una mejora del modelo preventivo y proactivo de los trastornos mentales y las drogodependencias. En este documento se apuesta por evitar y luchar contra la exclusión de este sector de la población. Así, el tratamiento para la cesación tabáquica en estos pacientes y la consideración de los servicios psiquiátricos *sin humo* al mismo nivel que los restantes servicios sanitarios aportan un importante valor de normalización.

Detrás de toda esta humareda de datos, falsos mitos y deficiencias se esconde un fuego que quema desde hace décadas. No es posible seguir ignorando por más tiempo la cuestión que nos ocupa y perpetuar la división entre el cuidado de la salud mental del paciente y el de su salud física y promoción de hábitos de vida saludables si queremos obtener una mejora de la calidad de vida de estos pacientes. No podemos ser testigos inactivos de su alta mortalidad y morbilidad cuando deberíamos ser protagonistas de su abordaje. Es fundamental vencer las barreras existentes y tener más presente esta labor médica preventiva pues no existe otro camino en la salud pública que pueda aportar, potencialmente, una mayor ganancia a este colectivo de pacientes.

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2 Puede encontrar más información sobre el grupo y sus trabajos en: http://www.xchsf.com/castella/tabacsalutmental.htm
3 Puede descargar la guía en: http://www.xchs

Annex 2

Article: **Deconstructing myths, building alliances: A networking model to enhance tobacco control in hospital mental health settings**

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Deconstructing myths, building alliances: A networking model to enhance tobacco control in hospital mental-health settings

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INTRODUCTION

The prevalence of smoking in people with mental disorders is higher than in the general population.[1, 2] However, smoking is viewed as a normal habit in the culture of mental-health settings. The aim of this article is to describe a strategy to overcome this neglected situation in Catalonia (Spain).

Smoking in mental health-care settings: Denying the problem

Smoking is the biggest avoidable cause of death and disability in developed countries.[3, 4] Although the prevalence of smoking in these countries has declined in recent years, certain populations, such as people with mental illness, are not following this trend.[5] This difference may reflect a failure of public health and clinical services to address the needs of this population.[6]

Smoking prevalence and the number of cigarettes per day rises as the severity of the mental disorder and the number of mental-health disorders in life increase.[1, 7] Consequently, the prevalence of smoking is dramatically higher in psychiatric inpatients, with prevalence rates up to 80%.[8–10] Thus, life expectancy for people with severe mental disorders may decrease by up to 25 years,[11–13] mainly due to diseases caused or worsened by smoking.[14–16] However, smoking has usually been neglected in mental health-care settings.

Patients with mental illness are less likely to receive advice to quit smoking than patients without mental illness.[17–19] Additionally, mental-health professionals and systems have been reluctant to implement total smoking bans in mental health-care

units.[18, 20, 21] While smoke-free policies in workplaces and public places have been implemented in many countries, mental-health wards are usually exempt.[21, 22]

A proposal of change through specific strategies

There is a need to increase the priority of tobacco control in the mental-health agenda. Changing priorities and professional motivation requires time and a well-defined strategy.

In Catalonia, a nation located in the north-eastern part of Spain with more than 7.5 million inhabitants, the Catalan Network of Smoke-free Policies ("the Network") was established in 1999 to promote tobacco-control strategies in hospitals[23] (www.xchsf.cat). The Network is supported and funded by the Catalan Government through its Public Health Agency. The Network currently (2015) consists of 75 hospitals, 90% of all hospitals that offer public services in Catalonia.

Tobacco control has been thoroughly improved in Catalan hospitals in recent decades; however, the impact of the Network on mental-health settings has been minor or lacking. Thus, the Network designed a specific strategy in November 2007 to target mental-health settings. This strategy required low-intensity institutional support; a low economic burden was also necessary in accordance with the Spanish financial crisis.

STRATEGY DEVELOPMENT AND OUTCOMES

Creating a framework to introduce changes: Recruiting early adopters

The Network began a new strategy to enhance tobacco control in hospital mental-health settings via a bottom-up approach that works from the grassroots through people working together, resulting in decisions that arise from collaboration. The strategy relied on the creation of a working group of key professionals identified as motivated and experienced in the topic of smoking in patients with mental disorders: the early adopters.

The Network based its strategy on Rogers' theory of the Diffusion of Innovations,[24] which explains the process that occurs when people adopt a new idea, practice, intervention, etc. This theory has been applied broadly in health-care settings.[25, 26] According to this theory, individuals are categorised by the degree to which they adopt a new idea earlier than other members of a social system. The Network sought early adopters of tobacco control in mental-health hospitals to serve as opinion leaders; early adopters are the first to adopt new strategies and to diffuse them to the majority through social channels.[24] This approach was intended to help speed the diffusion process and to broaden and strengthen the influence of professionals on their settings by having them act as a group.

Rogers[24] described five qualities that cause some new procedures or strategies to spread more rapidly and successfully than others: perceived benefit of the change, compatibility with existing beliefs and practices, complexity of the proposed change, trialability, and observable results of the adoption of the change by others. In our case, the first steps consisted of contacting key mental-health professionals and explaining the purpose of the working group (the Tobacco and Mental Health Group). Over time, more professionals from other hospitals joined the working group. The group held a maximum of three meetings per year and worked mainly over the Internet. Participation

in the working group was not economically rewarded, and funding from private companies was never involved.

The working group began in 2007 with 11 professionals from six hospitals; in 2015, it consisted of 28 professionals from 17 hospitals, which comprises 85.7% of all Catalan hospitals with mental-health inpatient units.

Through consensus, the working group established a variety of objectives. Outcomes from the working group are disseminated by members to their hospitals with the backing of the working group, the Network, and the Catalan Government.

The working group in action: Achieving relevant change

First activities: Exploring the situation and needs

The working group defined two initial steps. First, a guide to good practice principles was edited.[27] The group translated and adapted a guide from the Irish Health Promoting Hospitals Network[28] for the Catalan context. This document established the major principles for achieving good tobacco control in mental-health hospital units. Second, the level of tobacco control in mental health-care services in Catalonia was explored.[29] Based on the principles delineated in the guide, a questionnaire was designed to explore four dimensions: smoking intervention and resources, staff training and commitment, management of smoking areas, and communication of smoke-free policies. Responses to this questionnaire indicated that the main areas of concern were related to smoking intervention (offering intervention, the availability of smoking-cessation drugs, and follow-up after discharge) and staff training on smoking cessation.

Training professionals on interventions for smoking cessation

Based on the results of the questionnaire, the working group set objectives related to staff training. The complexity of new procedures or interventions affects their rate of diffusion. Thus, adopting new interventions requires the potential adopter to develop new skills and conceptualisations (the complexity of the proposed change, in Roger's theory).[24]

This training goal was achieved via three strategies. First, one-day training sessions in the headquarters of the Network were designed for all professionals working in mental-health units in hospitals. The members of the working group acted as peer educators. Second, mental-health staff teams were trained in their own hospitals though a "Training the Trainers" programme launched by the Network. Some members of the working group were accredited to deliver a standard course in their own hospitals. The programme offered personalisable presentation slides, pocket intervention guides, and credits for participants. Third, the working group wrote a comprehensive evidence-based clinical intervention guide for smoking cessation for patients with mental disorders[30] as well as a guide for conducting this intervention throughout inpatient stay and beyond.[31]

Total smoking bans

Until January 2011, Spanish tobacco-control law 28/2005 banned smoking inside hospitals. The new law (Law 42/2010, which came into force in January 2011) extended

the ban to outdoor hospital campuses[32] and to short-stay psychiatric units, both indoors and outdoors. After publishing arguments in favour of smoke-free outdoor spaces.[33] the Network advised several members of the Spanish Parliament of the necessity and feasibility of implementing these changes.

In the mental health-care settings of many countries, the debate about implementing total smoking bans has been long and hard; there was previously no scientific evidence about the potential health effects of implementing smoking bans, from the most permissive to the strictest. The Network therefore evaluated the levels of second-hand smoke (SHS) in all adult inpatient units in Catalonia.[34] Only units with total smoking bans had SHS levels below the WHO-recommended levels for long-term exposure, and units with indoor or outdoor smoking areas had levels of SHS between two and five times the recommended threshold.[34] However, professionals in these units were not aware of the levels of SHS and of the potential harmful health effects.[10] The Network's analysis was sent to the managers of each unit in order to foster a more realistic perception of the SHS levels in their wards. In general, greater perception of the advantages of an innovation leads to quicker adoption (the perceived benefit of change in Rogers' theory[24]).

Implementation of the new Spanish regulation prompted mental-health units to design intervention programmes for smoking cessation and to have smoking-cessation drugs available. Nicotine-replacement therapy was not usually included in the hospitals' portfolio services for these units; in 2009, only 48% of the acute units in Catalonia had nicotine-replacement therapy available[29] versus 81% in 2013.

Communication of tobacco-control activities

Communication of the activities carried out by the working group is important because the new procedures must be visible to potential adopters. An essential aim of this communication is to raise awareness in the mental-health community. New ideas, procedures, and interventions are not rapidly adopted if they are not compatible with the current values, beliefs, and practices of the majority (compatibility with existing beliefs and practices in Rogers' theory[24]).

Our dissemination strategy has been based on a variety of activities, for example: 1) clinical sessions at the hospitals that are conducted by members of the working group in those units and demonstration of the materials produced by the working group; 2) presentation of the results of studies and other activities in national congresses of psychology, psychiatry, nursing, addiction, and public health, on the group's web page, and, more recently, via Twitter; and 3) organisation of conferences supported by the Catalan Government. Three one-day conferences have been organised over six years. The aims of the conferences were to challenge prevailing misconceptions, to present guides formulated by the working group, and to show examples of good practices in hospitals, since facilitating the visibility of the results of new procedures leads to higher probabilities of adoption (observable results of the adoption of the change by others in Rogers' theory[24]).

Next steps

The goals achieved during hospitalisation were usually lost after the patients were discharged. The Network's efforts have been limited to the hospital setting; the

outpatient setting is beyond the scope of the Network. Appropriate follow-up has been demonstrated to be a key factor in maintaining tobacco abstinence after discharge.[35] Thus, the Network and the Catalan Government designed a new programme to ensure effective follow-up: all inpatients motivated to maintain their abstinence after discharge are offered free smoking-cessation drugs during outpatient treatment. Hospitals designed a protocol containing an intervention flowchart, defining clear referral pathways, identifying needed resources, and designating one coordinator each for the hospital setting and for the outpatient clinic. This strategy implies high levels of coordination and consistency among settings, as well as brief waiting periods between discharge and the first outpatient visit. The programme has been progressively implemented, initially on a small scale (trialability in Rogers' theory[24]). Hence, in the context of an integrative service model, the challenge is to enhance collaboration and coordination of the hospital with other levels of the National Health Service that provide outpatient treatment.

CONCLUSIONS

Improving smoking cessation among patients with mental illness is a priority for enhancing quality of life and reducing morbidity and mortality in these patients.[36] It is also a way to prioritise the rights of a usually marginalised population.

Some areas of tobacco control within the Catalan mental-health services still require improvement; however, approaches like those of the Network, together with improvements in Spanish tobacco-control legislation, promote successful tobacco control in these settings.

COMPETING INTERESTS

All authors declare that they have no conflicts of interest.

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Annex 3

Guia: **Tabac i salut mental: guia de bona pràctica hospitalària**

Edita: Grup de treball de Salut Mental i Tabac, Xarxa Catalana d'Hospitals sense Fum. Institut Català d'Oncologia. Departament de Salut de la Generalitat de Catalunya; 2009

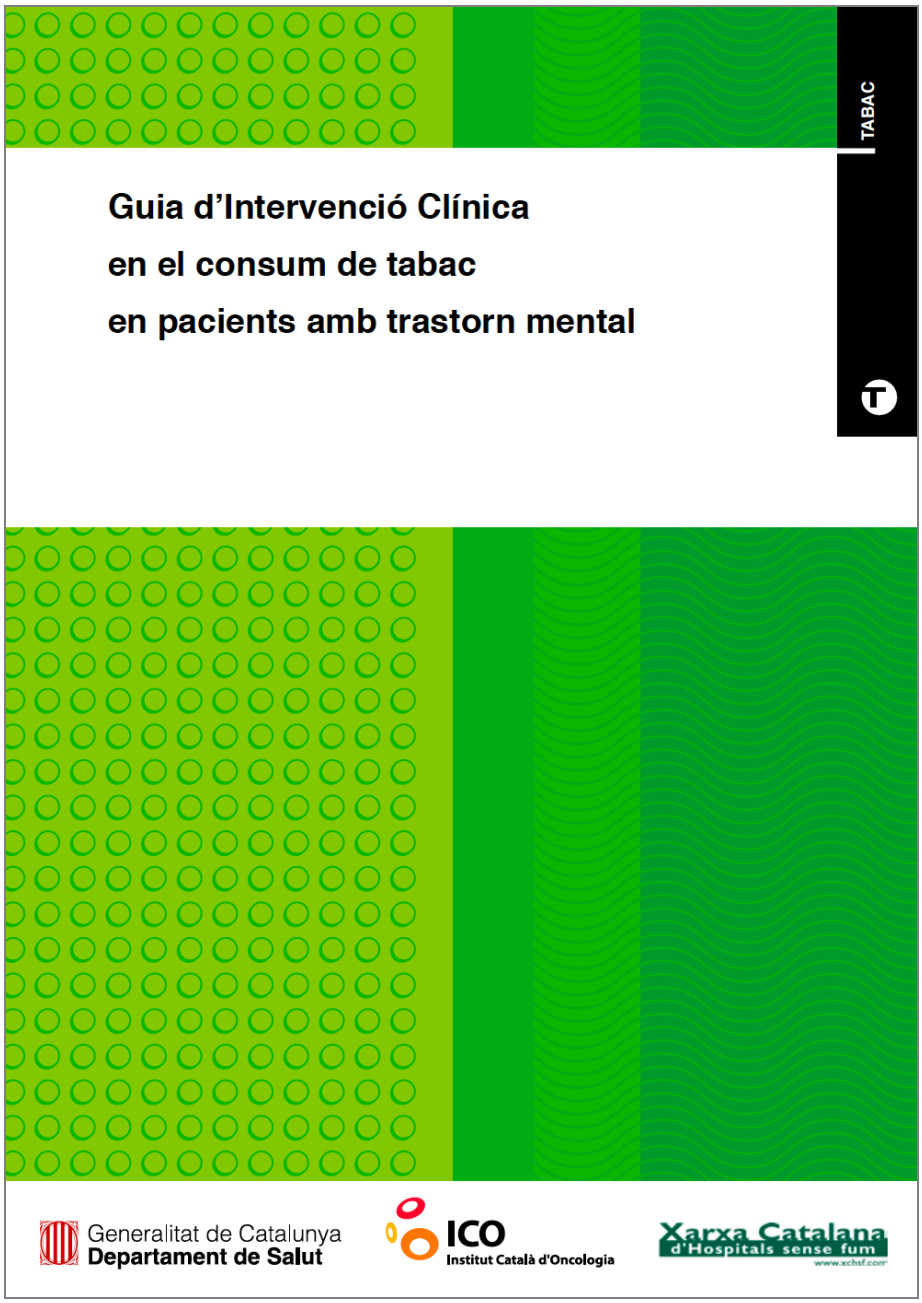
http://www.xchsf.com/docs/147-BONAPRACTICA.pdf

En aquesta guia es recullen principis i recomanacions per a un bon control del tabaquisme en els dispositius hospitalaris en salut mental quant a aspectes com el control dels espais, la intervenció sobre el consum o la formació dels professionals, entre d'altres.

Annex 4

Guia: **Guia d'intervenció clínica en el consum de tabac en pacients amb trastorn mental**

Edita: Grup de treball de Salut Mental i Tabac, Xarxa Catalana d'Hospitals sense Fum. Institut Català d'Oncologia. Agència de Salut Pública de Catalunya, Generalitat de Catalunya; 2012.



Cita suggerida:
Ballbè M, Gual A, coordinadors. Guia d'intervenció clínica en el consum de tabac en pacients amb trastorn mental. Barcelona: Xarxa Catalana d'Hospitals sense Fum, Institut Català d'Oncologia, Departament de Salut de la Generalitat de Catalunya, 2012.

http://www.xchsf.com/docs/142-guia_intervencio_cat.pdf

Aquest document és una guia d'intervenció clínica en el consum de tabac en pacients amb trastorns mentals a través d'especificacions generals per a aquests pacients i també segons patologies.

Annex 5

Guia: **Guia d'actuació en pacients fumadors ingressats en unitats de salut mental**

Edita: Grup de treball de Salut Mental i Tabac, Xarxa Catalana d'Hospitals sense Fum. Institut Català d'Oncologia. Agència de Salut Pública de Catalunya, Generalitat de Catalunya; 2013

Ballbè M, Cano M, Contel M, Feria I, Hernández R, Pagerols J, Sanz MT. Guia d'actuació en pacients fumadors ingressats en unitats de salut mental. Barcelona: Xarxa Catalana d'Hospitals sense Fum, Institut Català d'Oncologia, Departament de Salut de la Generalitat de Catalunya, 2013.

http://www.xchsf.com/docs/177-Guia%20_Actuacio_2013.pdf

En aquesta guia es fa una descripció pas a pas de l'actuació dels professionals sanitaris sobre el pacient fumador des de que ingressa a l'hospital fins que es dóna d'alta.

Annex 6

Procés editorial de l'article publicat a *Tobacco Control 2012*

Carta de presentació a l'editora

ICO
Institut Català d'Oncologia

UNIVERSITAT DE BARCELONA

L'Hospitalet de Llobregat, Barcelona. April 2011.

Dr. Ruth Malone
Editor
Tobacco Control Journal

Dear Dr. Malone,

Please find enclosed our manuscript "**Smoking policies in psychiatric services. Identification of unmet needs**" for your consideration in Tobacco Control as an *original article*.

Given the high impact of smoking in patients with mental illnesses, we have studied tobacco control strategies in psychiatric services. This study was carried out in 186 psychiatric inpatient services and day centers in Spain. This timely topic has been scarcely addressed in the international literature. While smoke-free policies in workplaces are spreading throughout many countries, psychiatric services still remain too often an exemption to them. In order to extend these policies as well as smoking interventions to these services, we considered of significant importance to explore which is the current situation.

All authors have carefully read and fully approved the manuscript. On behalf of them, I also state that the manuscript is original and it is not being submitted anywhere else for publication. The authors also declare no conflicts of interest. Should you need further information, don't hesitate to ask me for it.

Correspondence about the manuscript should be addressed to me as indicated in the title page.

Thank you very much for your kind attention.

Yours sincerely,

Esteve Fernandez, MD, PhD
Director, Tobacco Control Research Programme, Institut Català d'Oncologia
Associate Professor, Department of Clinical Sciences, Universitat de Barcelona
E-mail: efernandez@iconcologia.net

Resposta de l'editora i comentaris dels revisors

From: <tobaccocontrol@bmjgroup.com>
Date: 2011/6/9
Subject: Tobacco Control - Decision on Manuscript ID tobaccocontrol-2011-050029
To: esteve.fernandez@ub.edu

08-Jun-2011

Dear Dr. Fernandez:

Manuscript ID tobaccocontrol-2011-050029 entitled "Smoking policies in psychiatric services. Identification of unmet needs" which you submitted to Tobacco Control, has been reviewed. Following review, the editors have decided that the paper requires revision. We will be happy to reconsider it after revision, providing you have responded to the comments of the referee(s) (see below).

Please note, by offering to reconsider a revised paper, we are making no commitment to publish a revised version.

Important: Please CUT AND PASTE THE REVIEW COMMENTS BELOW INTO A SEPARATE DOCUMENT. With spaces between each comment and your response, provide a specific reply to each reviewer comment, making it clear whether or not you have incorporated the changes as suggested and indicating where the relevant changes are now found in the text. If you elect not to follow reviewers' suggestions or respond to particular criticisms, please provide a response in each case so that the editors might consider your reasoning.

In addition, the ms has some English problems--if possible, please have a native English speaker edit the revision before resubmitting as our copyediting of late has been a bit uneven.

Tobacco Control is published six times per year, and because of the inherent delay in publication with this schedule, we are concerned to avoid overly lengthy periods between notifying authors that a paper needs revision and receipt of the revised version.

If you DO intend to resubmit a revised version, please inform us of the likely submission date.

If we do not hear from you within 4 weeks, we will assume that you do not intend to resubmit and will withdraw your paper. If you need to request an extension of this deadline, please contact us as soon as possible.

To revise your manuscript, log into http://mc.manuscriptcentral.com/tobaccocontrol and enter your Author Center, where you will find your manuscript title listed under

"Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below link you will not be required to login to ScholarOne Manuscripts.

http://mc.manuscriptcentral.com/tobaccocontrol?URL_MASK=cb9dwqxhrDkGCQK2q6My

You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Because we are trying to facilitate timely publication of manuscripts submitted to Tobacco Control, your revised manuscript should be submitted by 07-Aug-2011. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission.

We also ask that in addition to the revised paper you provide a point by point response to the reviewer comments, and upload a marked copy of your paper highlighting the changes you have made - preferably 'tracked changes' if using Microsoft word. Please upload this as a supplemental file and label it 'Marked Copy' (your paper will not be able to be processed without this).

All material submitted is assumed to be submitted exclusively to the journal unless the contrary is stated. Submissions may be returned to the author for amendment if presented in the incorrect format.

Please note that only the article text (from first word of main text to the last word in reference list) will be used to typeset your article.

All other data (known as the metadata), such as article title, author names and addresses, abstract, funding (etc) statements will be taken from the fields you have filled in at submission, so you must ensure that these are up to date and accurate.

I hope you will find the comments useful.

Respectfully,
Ruth Malone
Editor-in-Chief, Tobacco Control
tobaccocontrol@bmjgroup.com

Reviewer(s)' Comments to Author:

Reviewer: 1
Comments to the Author
It is good to hear of the progress in a Spanish region as psychiatric hospital services move toward becoming more smoke-free. Addressing the comments below would, in my opinion, strengthen the paper and clarify the lessons it contains.

* Page 3, line 48. Can you give some context about the newc hanges in the partial law. How did that happen? Were mental health professionals involved? Is Catalonia different regarding this issue, or does it reflect the general feeling in the whole of Spain?

* Page 3, line 56. For those who are not so familiar with Spain, please explain that Catalonia is one of 17 Spanish provinces, has a population of ___, and contains __ percent of the Spanish population. You also might want to argue why it is important to learn about a specific region, rather than the entire nation.

* Page 4, line 5. It would be helpful to have some context about the Catalan Network of Smoke-free Hospitals, CNSfH. What does it take to join? How old is the network? Does each province have a similar network, or is Catalonia a leader in the way that California often leads the United States in smoke-free policies?

* Page 8, line 17. In the discussion you comment on the potential accuracy issues of self-reported data. It would be useful to include the specific question about cigarettes as a reward, incentive or therapeutic tool. (Ever use? Often use? etc.)

* Page 9, line 6. The text doesn't provide much discussion about Table 2. Do the authors have other feelings about important information contained in the Table.

* Page 9, line 34. For Table 3, the differences between the CNSfH and non-CNSfH institutions are not that dramatic, even if some achieved statistical significance. Do the authors wish to comment about that either in the results or discussion sections?

* Discussion. I was not clear what the authors felt to be the most important findings of this survey. Was it that there is a lot more to be done, as indicated in the title? Was it to show that membership in the CNSfH was somewhat helpful, but not as much as might have been expected? Was it that the passage of the new legislation is likely to improve these results? All of the above? It was also not clear how much impact belonging to the network had on policies and attitudes. Clarifying these messages would be helpful.

* Table 1. I don't understand the numbers. If there are 186 total institutions, of which 64 are in the network and 62 are not, what happened to the other 60?

* Tables 2 and 3. Please indicate in the legend that higher scores indicate stronger tobacco control.

Reviewer: 2
Comments to the Author
This is an interesting paper on a relevant issue of growing interest, and it would be appropriate to publish it. The authors could improve the manuscript before publication. In my opinion, it needs to be put in a global perspective, and lose a certain advocacy style, with some value judgments in the text that are inappropriate for a journal. Banning smoking from inpatient mental health facilities is something that is not universally accepted, and much less achieved internationally. The authors take for granted that this is the only acceptable standard, and thus use terms which imply value judgments through the paper (successfull, ineffective, poor...), which would benefit from a more neutral approach for publication in a Journal. This reviewer advocates for smoke-free mental health facilities, but takes good care of using neutral language when discussing the issue with others and in scientific settings. On the other side, even in a context where regulations leave room for smoking in mental health facilities, the policies of each institution may encourage smoke-free areas. In fact, some of the authors were involved in efforts in this direction, which could also be explained (and referenced: their guidelines were excellent). I would encourage a revision that makes clear that when the 2005 regulations were implemented in January 2006 most health facilities became smoke-free, but that progress was more modest in mental health inpatient facilities for which there were exemptions. The result could be also put in international context, as there are few examples of completely smoke-free mental health facilities.
Other aspects that could be improved in a review include the explanation of the nature of the study in the methods section and in the abstract (this is a survey to key players rather than a cross sectional study -which suggests a population base),; the target population (perhaps administrators / managers would be better); rather than referring to the 'former Spanish law' it would be better to refer to 'the 2005 law'; and in page 11 rather than 'Spanish policy' the appropriate term would be 'Spanish regulation'.

Reviewer: 3
Comments to the Author
This is an important and timely piece of work which contributes to the knowledge base in this area of research. My comments are of a minor nature and include:

Introduction:
Smoking prevalence is 'at least' twofold (and in inpatient populations which are the ones relevant for this study) even higher.
I thought premature death occurred around 20 years early; I would say 'by conditions that are OFTEN caused of exacerbated by smoking' (not exclusively so!)

Methods:
Might help to present content of questionnaire in a somewhat more readerfriendly form;

suggest bullet points and paragraphing?

It is 'Likert scale', not Lickert scale

I might suggest changing the title to 'smoke-free policies' rather than smoking policies.

Resposta als comentaris dels revisors

L'Hospitalet de Llobregat, Barcelona. July 2011.

Dr. Ruth Malone

Editor

Tobacco Control Journal

Dear Dr. Malone,

We want to thank you very much for the opportunity to resubmit our manuscript 011-050029, originally entitled 'Smoking policies in psychiatric services. Identification of unmet needs' (title after revision: 'Smoke-free policies in psychiatric services: identification of unmet needs'), which has been modified in line with the useful reviewers' comments.

We appreciate indeed the kind editorial and reviewers' comments and suggestions. We enclose a point-by-point response. Modifications in the text of the manuscript have been marked using the "tracked changes" option.

As suggested by the editor, the revised version of the manuscript has been edited by a native English speaker in order to improve the style.

Sincerely yours,

Dr. Esteve Fernández

Reviewer 1

1. Page 3, line 48. Can you give some context about the new changes in the partial law. How did that happen? Were mental health professionals involved? Is Catalonia different regarding this issue, or does it reflect the general feeling in the whole of Spain?

We appreciate the comment and we would be pleased to further elaborate this point. However, a full explanation in line with the reviewer suggestion will lengthen the Introduction. We are inclined to add a reference where the process has been summarized (reference 17 [former reference 27]). In fact, the process of change of the law has different elements: the scientific evaluation of the impact on second-hand smoke exposure, the positive social climate and acceptability of smoke-free places, the favourable wishes and determination of key persons within the national and regional public health administration (including mental health professionals), and the sustained advocacy from scientific societies, professional bodies, trade unions, and citizens' associations. After one year of review and debate at different levels, the Spanish Parliament changed the partial ban to a total ban, converting Spain in a true smoke-free country from January 2nd, 2011. Whereas Catalonia has some cultural differentials with respect the rest of Spain, all the process regarding the change of the law has been nationwide.

2. Page 3, line 56. For those who are not so familiar with Spain, please explain that Catalonia is one of 17 Spanish provinces, has a population of ___, and contains __ percent of the Spanish population. You also might want to argue why it is important to learn about a specific region, rather than the entire nation.

According to the reviewer, we have tried to improve the explanation about the region evaluated in this study in the "Methods" section (page 4, line 22):

"Catalonia is one of 17 autonomous regions of Spain, located in the north-eastern part of the country. It has 7.5 million inhabitants, nearly 16% of the total Spanish population. Spain has a unique national health system, with decentralised management organised by the autonomous regions. The smoke-free policies and regulations are nationally applicable, without exception among autonomous regions."

We do not believe that is more important to learn about a specific region or another or the whole country, but in our case the target is Catalonia because we work in this region. This is just a matter of organization, as also occurs with other health systems in developed countries. Moreover, we have an easier access to the mental health units in our region and we have been able to contact all of them (the whole universe of "study subjects") instead of sampling. A similar study for the whole Spain should

imply to obtain a representative sample of mental health units, increasing the likelihood of selection bias due to non-response.

3. Page 4, line 5. It would be helpful to have some context about the Catalan Network of Smoke-free Hospitals, CNSfH. What does it take to join? How old is the network? Does each province have a similar network, or is Catalonia a leader in the way that California often leads the United States in smoke-free policies?

We have included some more details about the Catalan Network in the text following the reviewer suggestion (page 3, line 26):

"In Catalonia (Spain), the Catalan network of smoke-free hospitals, founded in 1999, recommends that its affiliates ban smoking without exemptions."

"To join the Network, hospitals must commit to a progressive implementation of tobacco control strategies with the support of the Network."

"The Catalan network of smoke-free hospitals currently comprises 64 hospitals (90% of all public hospitals), including general hospitals with or without psychiatric services or psychiatric wards."

For far more details we have also included another reference (number 19):

19. Fernández E, Fu M, Martínez C, et al. Secondhand smoke in hospitals of Catalonia (Spain) before and after a comprehensive ban on smoking at the national level. Prev Med 2008;**47**:624-8.

There are some other networks in other regions of Spain, but formed more recently and without the same degree of implementation as the Catalan network. In this sense, Catalonia has been more active than other parts of Spain, whereas the smoke-free policies, as previously commented, are common for all the regions.

4. Page 8, line 17. In the discussion you comment on the potential accuracy issues of self-reported data. It would be useful to include the specific question about cigarettes as a reward, incentive or therapeutic tool. (Ever use? Often use? etc.)

This question is included in the results (page 10, line 4) but in order to clarify this point, we have modified this sentence that now reads:

"… but only 7.6% of these admitted that they used cigarettes frequently (always or often) as a reward, incentive, or therapeutic tool."

At the same time, we have added a sentence in the discussion (page 15, line 3):

"For example, future studies should ascertain the validity of the question regarding the use of cigarettes as a reward."

5. Page 9, line 6. The text doesn't provide much discussion about Table 2. Do the authors have other feelings about important information contained in the Table.

Results in Table 2 are pretty similar among the different units examined, with the exception of day centres where, as discussed in the text, tobacco control is significantly lower. Many possible explanations for this finding came to our mind when we first analyzed the results, but since we don't have any data supporting these possible explanations, we decided not to mention them as they would be merely speculative and could stigmatize this kind of units. This issue needs further research, since these units are of paramount importance for many patients once they are stabilized of their condition.

It is in this vein that we have added in the discussion (page 13, line 18):

"More effort should be made to improve training and intervention skills in these settings. Further research should clarify why tobacco control remains unaddressed in these centres."

6. Page 9, line 34. For Table 3, the differences between the CNSfH and non-CNSfH institutions are not that dramatic, even if some achieved statistical significance. Do the authors wish to comment about that either in the results or discussion sections?

The reviewer is right in that overall differences are not that dramatic (Table 3), but when you look carefully to specific items (Table 1) of the questionnaire you find out differences in some critical items from mainly two dimensions (i.e., smoking intervention and staff training and commitment) that we wanted to highlight. We may consider that the Network has been somewhat helpful in these issues, because what the network does is offering support and resources like training courses to the professionals or free medications for quitting tobacco, as clearly stated in the discussion (page 14, line 3): *"The Network provides different resources specifically conceived to help hospitals in tobacco control (i.e.: training for professionals, a*

common tobacco cessation program for patients and professionals, free access to smoking cessation drugs, etc.)."). Thus, we have made no changes since we truly believe this point is already discussed in the text and will be of interest for the readers.

7. Discussion. I was not clear what the authors felt to be the most important findings of this survey. Was it that there is a lot more to be done, as indicated in the title? Was it to show that membership in the CNSfH was somewhat helpful, but not as much as might have been expected? Was it that the passage of the new legislation is likely to improve these results? All of the above? It was also not clear how much impact belonging to the network had on policies and attitudes. Clarifying these messages would be helpful.

To our opinion, the most important finding of this survey are the unmet needs and areas of improvement in tobacco control in psychiatric health services, while the points about the network and the new legislation are also of particular note but more in terms of some possible ways to 'meet these unmet needs'. For this reason at the end of the discussion we have added this paragraph (page 15):

"In conclusion, this study revealed unmet needs and areas that require improvement in tobacco control within the psychiatric health services. Approaches like done those of the Catalan network of smoke-free hospitals, and changes in legislation could promote successful tobacco control in these settings."

8. Table 1. I don't understand the numbers. If there are 186 total institutions, of which 64 are in the network and 62 are not, what happened to the other 60?

We also surveyed Day Centres in this study (n=60). These centres were excluded for the comparison between members and non-members of the Catalan Network because they cannot belong "by definition" to the network since they are not considered 'hospitals'.

However, taking into consideration the reviewer's comment, we have further explained this point in the results section of the text (page 11, line 24):

"We excluded day centres from these analyses, because the Network included only hospital settings."

Moreover, we have tried to better explain this issue in the legend of Table 1:

"Day Centres were excluded (n=60), because they not were not allowed to be affiliated to the CNSfH."

9. Tables 2 and 3. Please indicate in the legend that higher scores indicate stronger tobacco control.

According to the reviewer suggestion, we have clarified this issue in the legend of both tables for an easier understanding of them *("†Higher scores indicate higher implementation of tobacco control strategies.").*

And in the "study instrument" section in the text (page 7, line 6):

"The total score ranged from 0 to 96; high scores indicated high implementation of smoke-free policies."

Reviewer 2

1. The authors take for granted that this is the only acceptable standard, and thus use terms which imply value judgments through the paper (successful, ineffective, poor...), which would benefit from a more neutral approach for publication in a Journal

We understand the point of the reviewer and we have tried to change some parts of the text in order to show less advocacy (please see the main text). The reviewer is right that the issue of banning smoking in psychiatric wards is somewhat controversial. Some professionals do not *believe* that hospitalization is the best moment to deal with tobacco consumption. However, there is *evidence* that total bans do not increase: 1) aggression in patients, 2) use of seclusion, 3) discharges against medical advice, 4) use of psychotropic medication. Nonetheless, besides the fact that total bans might be controversial, trying to help patients to quit smoking and trying to diminish secondhand smoke exposure in the wards are not. Results globally show that: a) little intervention is being done and b) usually this little intervention might be due to a lack of intervention skills or to unavailability of resources, rather than because professionals don't want to.

2. ...even in a context where regulations leave room for smoking in mental health facilities, the policies of each institution may encourage smoke-free areas. In fact, some of the authors were involved in efforts in this direction, which could also be explained (and referenced: their guidelines were excellent)

As the reviewer suggests we have included in the discussion those efforts done by the Catalan Network to advance in tobacco control specifically in hospital mental health settings and that can help to better understand those results depending on the affiliation of the units to the Network (page 14, line 6):

"In the mental health field, the Network published a guide in 2009 for best practices and recommendations,[29] based on a similar Irish guide,[30] to strengthen tobacco control activities in hospital mental health settings."

3. I would encourage a revision that makes clear that when the 2005 regulations were implemented in January 2006 most health facilities became smoke-free, but that progress was more modest in mental health inpatient facilities for which there were exemptions.

We have tried to improve the explanation about the changes in the Spanish regulation in the introduction (page 3, line 19):

"In Spain, the former smoking regulation (Law 28/2005)[16], which was in force until December 2010, banned smoking in indoor public places and workplaces, including hospitals. However, the law exempted psychiatric services, where indoor smoking rooms were permitted "if deemed necessary". The new law (Law 42/2010, which came into force on the 2nd of January 2011) has extended the ban to outdoor hospital campuses, and it also banned smoking areas (either indoor or outdoor) in short stay psychiatric units. However, smoking rooms continue to be allowed in medium and long stay psychiatric units.[17]"

4. The result could be also put in international context, as there are few examples of completely smoke-free mental health facilities.

We believe that the paragraphs already available in the text (page 14) are putting the results in perspective with the scarce data available from other countries. We have revised the text and added a reference from an unpublished work (but presented as an oral communication at a congress, reference 31) which revises the smoke-free regulations in the countries of the WHO European Region, showing that most countries do not have a total ban in psychiatric units.

5. Other aspects that could be improved in a review include the explanation of the nature of the study in the methods section and in the abstract (this is a survey to key players rather than a cross sectional study -which suggests a population base),

We thank the reviewer for this comment but we do not fully agree with his/her suggestion. In terms of study design, this is a cross-sectional study. Cross-sectional design does not imply a population-based investigation but an epidemiological (observational) study in which the observations are done at a given point of time, like a snap shot. Thus, we are inclined to maintain our phrasing just adding "surveys" to cross-sectional as follows (page 4, line 15):

"A cross-sectional survey was conducted from December 2008 to March 2009. The survey target population was clinical managers directly in charge of psychiatric units."

6. ... the target population (perhaps administrators / managers would be better).

We have specified the target population in the "Methods" section, see above point 5.

7. ...rather than referring to the 'former Spanish law' it would be better to refer to 'the 2005 law'; and in page 11 rather than 'Spanish policy' the appropriate term would be 'Spanish regulation'.

Text has been modified according to the reviewer suggestion (page 12, line 10).

Reviewer

1. Introduction: Smoking prevalence is 'at least' twofold (and in inpatient populations which are the ones relevant for this study) even higher. I thought premature death occurred around 20 years early; I would say 'by conditions that are OFTEN caused of exacerbated by smoking' (not exclusively so!).

The text (first paragraph of the introduction) has been modified according to the reviewer suggestion.

"Individuals with severe mental illnesses die approximately 25-30 years earlier than expected for the general population, often by conditions usually caused or exacerbated by smoking.[3, 4]"

The study of Miller BJ et al. (reference number 4 in the manuscript) found up to 32.0 years of potential life lost per patient, heart diseases being the leading cause of death.

2. Methods: Might help to present content of questionnaire in a somewhat more reader friendly form; suggest bullet points and paragraphing?

In line with the reviewer suggestion, we have tried to improve the presentation of the content of the questionnaire for an easy reading (please see text, page 5-7).

3. It is 'Likert scale', not Lickert scale.

The correction has been made.

4. I might suggest changing the title to 'smoke-free policies' rather than smoking policies.

We thank the reviewer again for this comment. We have changed the title as follows:

"Smoke-free policies in psychiatric services: identification of unmet needs"

Carta d'acceptació condicional a la publicació del manuscrit

From: <tobaccocontrol@bmjgroup.com>
Date: 2011/8/5
Subject: Tobacco Control - Decision on Manuscript ID tobaccocontrol-2011-050029.R1
To: esteve.fernandez@ub.edu

05-Aug-2011

Dear Dr. Fernandez:Manuscript ID tobaccocontrol-2011-050029.R1 entitled "Smoke-free policies in psychiatric services: identification of unmet needs" which you submitted to Tobacco Control, has been reviewed.

After considering your manuscript, we would be pleased to accept it for publication, providing you attend to the following minor changes:

1. Listing all of the questions in the text when they are also in Table 1 is unnecessary and tedious to read. On page 5-7, please just summarise the dimensions and number of items under each, e.g. Smoking intervention (6 items); Staff training (4 items) and then refer readers to Table 1 for the questions themselves.
2. On page 7, first line under "Procedure": do you mean a list of centres that offered "psychiatric" services?
3. Page 12, under Discussion: This has unnecessary words. Please delete "The results of this study suggested that..." and begin with "This study shows that smoking was managed..." Please also delete "These concerning results indicated that" and begin sentence "Health professionals..." We already know you are discussing your results.
4. Page 13: Line 4, delete "Results showed that" and begin sentence "Only half..." Page 14: Line 26, please change "improve" to "address." It sounds odd to "improve ineffectiveness."

5. Page 14, para beginning "Few countries": change to "total smoking bans in" instead of "total bans in smoking for"

6. Page 15: Delete "remarkable" line 26.

7. You might think about adding a last sentence that says something like "Patients with psychiatric illnesses deserve the same health protections as those with other types of illnesses" or something to that effect to strengthen your conclusion.

The journal has recently introduced a requirement that all original articles be accompanied with a box summarising what this paper adds to the existing literature. If your paper does NOT already have this, please see end of email for guidelines for its completion.

To revise your manuscript, log into http://mc.manuscriptcentral.com/tobaccocontrol and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below link you will not be required to login to ScholarOne Manuscripts.

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You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Because we are trying to facilitate timely publication of manuscripts submitted to Tobacco Control, your revised manuscript should be submitted by 04-Sep-2011. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission.

We also ask that in addition to the revised paper you provide a point by point response to the reviewer comments, and upload a marked copy of your paper highlighting the changes you have made - preferably 'tracked changes' if using Microsoft word. Please upload this as a supplemental file and label it 'Marked Copy' (your paper will not be able to be processed without this).

All material submitted is assumed to be submitted exclusively to the journal unless the contrary is stated. Submissions may be returned to the author for amendment if presented in the incorrect format.

Please note that only the article text (from first word of main text to the last word in reference list) will be used to typeset your article.

All other data (known as the metadata), such as article title, author names and addresses,

abstract, funding (etc) statements will be taken from the fields you have filled in at submission, so you must ensure that these are up to date and accurate.

I hope you will find the comments useful.

Respectfully,

Dr. Ruth Malone
Editor, Tobacco Control
tobaccocontrol@bmjgroup.com

Carta d'acceptació final del manuscrit

De: onbehalfof+tobaccocontrol+bmjgroup.com@manuscriptcentral.com [mailto:onbehalfof+tobaccocontrol+bmjgroup.com@manuscriptcentral.com] En nombre de tobaccocontrol@bmjgroup.com
Enviado el: miércoles, 24 de agosto de 2011 21:18
Para: esteve.fernandez@ub.edu
Asunto: Tobacco Control - Decision on Manuscript ID tobaccocontrol-2011-050029.R2

24-Aug-2011

Dear Dr. Fernandez:

Thank you for sending your paper to Tobacco Control. I am pleased to inform you that it has been accepted for publication. Your paper has been forwarded to the BMJ Publishing Group (publisher) for manuscript editing and typesetting; it will be featured in the next available issue. You will receive page proofs and an order form for reprints in due course.

Providing your article is accepted in advance of its scheduled publication in an issue, it will be published Online First.

Online First enables the publication of articles ~3 weeks after final acceptance and prevents any delays to publication encountered when awaiting publication in a print issue. Advanced publication establishes primacy for the work, with the initial online publication date included on the final print version.

We have now changed our online publication model from unedited author raw manuscript PDFs to edited typeset PDFs and searchable full text. This will improve the presentation and accessibility of articles published online. This initial version is also indexed by PubMed and the article is fully citable.

When you receive your proof please check it carefully, corrections cannot be made after it has been approved for publication, irrespective of whether it is Online First or published directly into a print issue. The only difference between Online First and issue publication will be the citation details and the addition of the Online First publication date to the second version.

Your article may also be selected for press release by our Press Office. If this is the case, you will be contacted independently by our press officer.

For further details and guidelines about Online First please click here:
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Please note, some articles, such as letters and editorials, are published in sections with a range of other articles. When you click on the [Published version] link you will see the full text version of the first letter/editorial in the range only. To obtain your letter/editorial you will need to click on the link: Reprint (PDF) version of this article which is in the top right hand corner box. This will download the pdf of all letters/editorials within the page range.

Keep track of usage for your article. Each article published in Tobacco Control has individual usage statistics available online. These are updated monthly and can be accessed from the Article Usage Statistics link in the Services section of the right hand column on each page of the article.

If you have any questions, please contact me, quoting the manuscript ID.

Yours Sincerely,

Dr. Ruth Malone
Editor-in-Chief , Tobacco Control
tobaccocontrol@bmjgroup.com

Annex 7

Procés editorial de l'article publicat a *International Journal of Epidemiology*

Carta de presentació a l'editor

ICO
Institut Català d'Oncologia

UNIVERSITAT DE BARCELONA

L'Hospitalet de Llobregat (Barcelona), 27th July 2012

Dr G Davey Smith & Dr S Ebrahim
Chief Editors
International Journal of Epidemiology

Dear Dr Smith and Dr Ebrahim,

We would like to submit our manuscript, "**Second-Hand Smoke in Mental Health Care Settings: Time to implement Total Smoke-Free Bans?**" for your consideration in the International Journal of Epidemiology as an original article.

This study objectively assessed second-hand smoke levels in mental health units in Catalonia, Spain. The assessed units represent 95.5% of all mental health units in this area, which has 7 million inhabitants. We found that only units with total smoking bans, i.e. units that did not allow smoking inside and outside, had second-hand smoke levels that were below the World Health Organization's standard recommended levels.

Smoke-free policies have been extended to public and work spaces in some countries with beneficial consequences at a public health level, mainly on cardiovascular diseases and respiratory symptoms. However psychiatric units are often exempted. Only a few countries, have banned indoor smoking in psychiatric hospitals, and this topic is still being debated. Moreover, despite the impact of second-hand smoke on staff, this impact may be greater on mental health patients due to their poorer baseline health.

To our knowledge, this is the first study to objectively evaluate second-hand smoke levels in mental health units. The question of whether smoking should be banned in mental health units is a matter of ongoing debate by policy makers and mental health professionals worldwide, with no objective data about the impact of different policies, such as partial vs. total bans. The findings of this study indicate that only total bans in mental health units protect

patients and staff from second-hand smoke; thus, this information is relevant to policy makers as well as to health professionals for determining the most appropriate smoking policies.

All authors have carefully read and fully approved the manuscript. On behalf of all authors, I state that the manuscript is original and is not being submitted elsewhere for publication. The authors declare no conflicts of interest.

Correspondence should be addressed to me, as indicated on the title page. Please do not hesitate to contact me if more information is needed or if there are any questions regarding this work. Thank you very much for your consideration.

Yours sincerely,

Esteve Fernández, MD, PhD
Head, Tobacco Control Unit, Cancer Prevention and Control Programme,
Institut Català d'Oncologia.
Associate Professor of Epidemiology & Public Health,
School of Medicine, Campus de Bellvitge, **Universitat de Barcelona.**

Resposta de l'editor i comentaris dels revisors

-----Mensaje original-----
De: onbehalfof+ije-editorial+bristol.ac.uk@manuscriptcentral.com [mailto:onbehalfof+ije-editorial+bristol.ac.uk@manuscriptcentral.com] En nombre de ije-editorial@bristol.ac.uk Enviado el: miércoles, 07 de noviembre de 2012 12:16
Para: efernandez@iconcologia.net; mballbe@iconcologia.net
Asunto: Your paper with International Journal of Epidemiology

Second-Hand Smoke in Mental Health Care Settings: Time to Implement Total Smoke-Free Bans?
IJE-2012-07-0732
07-Nov-2012

Dear Dr. Fernández,

Thank you for sending us this paper to consider for publication in the International Journal of Epidemiology. We have now obtained peer review comments, which we enclose. We feel that, with revision, it would be suitable for publication. However, several important issues have been identified all of which would need to be dealt with before the paper is accepted. We would therefore like you to revise the paper in light of the enclosed comments and resubmit it. We cannot, however, guarantee acceptance at this stage.

If you are to take up the offer to revise and resubmit the manuscript then please do so within 3 months. If we have not heard from you within this time we will assume that you are not intending to resubmit the paper, which will be removed from our active files.

When you resubmit the paper we will require 2 copies of the new version of the paper. One copy - uploaded as supporting document - should show revisions by underlining any additional text and marking the location of deleted text in the margin. Please also send a detailed letter explaining how you have responded to the referee's comments. This should deal with each comment made by the referee, and if you have decided not to follow the advice given then you need to explain why this is so.

Your paper should incorporate a "key messages" box, with the key messages of your paper made in 3-5 succinct sentences. Instructions and additional material we require with your resubmission are provided in the attached checklist.

In the IJE we actively discourage the use of the term "statistically significant" or just "significant" and such statements in method sections as "findings at $p<0.05$ were considered significant". Where used, we ask authors to provide effect estimates with confidence intervals and exact P values, and to refrain from the use of the term "significant" in either the results or discussion section of their papers. Our justification of

this position is given in the Sterne J, Davey-Smith G. "Sifting the evidence - What's wrong with significance tests?" BMJ 2001: 322:226-231.

We look forward to hearing from you in due course.

With all best wishes
Jordi Sunyer
IJE Editor

Comments to the Author

In addition to comments from reviewer 3 I have some concern about methodology in the measurement of PM2.5 given that the measuring time is short (between 45 and 90 minutes). The authors should provide evidence that there is no confounding by hour of the day and season.

Another issue refers to the Public Health impact of this topic. To my view tobacco remains a priority and indoor pollution one of the first environmental risks.

Referee: 1
Comments to the Author
This well written manuscript summarizes new research findings on the effectiveness of different levels of bans on smoking in psychiatry units in Catalonia Spain. The study was conducted during the process of the area adopting new regulations on tobacco smoke allowing for variability in policies. The findings indicate that only complete smoking bans (indoor and out) achieved air quality levels in the range recommended by the WHO. All other types of bans had air levels suggesting harmful levels of exposure to SHS. The information has direct clinical, organizational, and policy implications for patients, staff and visitors in inpatient psychiatry. The study examined different types of units: acute inpatient units, sub-acute and medium- and long-stay units, and detox or dual disorder units. The analysis did not examine differences in PM2.5 levels by unit type and that would be of interest. The authors note that PM2.5 is not a specific marker of SHS. It would be helpful to discuss how future studies would improve upon methods with greater specificity for SHS and what additional particulate sources could possibly be contributing to PM2.5 (if any), to give a fuller understanding of this methodological limitation. The discussion would be enhanced with mention of recent epi studies indicating an association between SHS exposure and mental health and suicidality.

Referee: 2
Comments to the Author
This paper is the first to my knowledge with measurements of second-hand smoke exposure in a large sample of mental health care settings. I suggest to accept without revision.

Referee: 3
Comments to the Author

Page 2, Line 21 Abstract: “We measured air concentrations of particulate matter <2.5 µg/m3 (PM2.5) as a marker of second-hand smoke in different locations at each unit.”
Please correct <2.5 µm/m3 (micrometer)

Page 3, Line 22: “People with mental illnesses have a higher prevalence of smoking than…”
I suggest “…have a higher prevalence of smoking habit than…”

Page 5, line 24: “We measured the concentration of respirable suspended particles with an aerodynamic diameter equal to or less than 2.5 µg/m3 (PM2.5 in µg/m3) as a marker of second…”
Please correct “We measured the mass concentration (µg/m3) of respirable suspended particles with an aerodynamic diameter equal to or less than 2.5 µm (PM2.5) as a marker of second…”

Page 5, line 26: “Particles emitted from burning cigarettes are in a size range of 0.002–2 µg/m3”.
Please correct “… in a size range of 0.002-2 µm”.

Page 6, line 5: “…which were mainly due to traffic air pollution.” Please erase this sentence because it’s hard to demonstrate it.

Page 6, line 5: Was each PM2.5 measure corrected for outdoor PM2.5? If not, consider the suggestion below.

Page 6, line 53: “The geometric mean of the PM2.5 concentrations at control locations, i.e. measured outdoors away from the hospital campuses, was 10.88 µg/m3 (95%CI: 10.26–11.52 µg/m3)”. This information should be used to underline the low variability of outdoor PM concentration, in order to strengthen the reliability of indoor measurements in the different premises at different times if single data are not reported as corrected for outdoors.

Page 8, paragraph line 42: For facilities without total smoking ban Authors should also consider “residual tobacco smoke” as an additional contribution to poor indoor air quality (Authors may quote Invernizzi G., Ruprecht A, De Marco C, Paredi P, Boffi R. Residual tobacco smoke: measurement of its washout time in the lung and of its contribution to environmental tobacco smoke. Tobacco Control. 2007; 16:29-33.

Page 9, line 15: please cite also alcohol as a frequent risk factor for mental health patients.

Page 10, line 57: among limitations of the study, list also the rather short sampling time (15 minutes).

Resposta als comentaris dels revisors

ICO
Institut Català d'Oncologia

UNIVERSITAT DE BARCELONA

November 30th, 2012
L'Hospitalet de Llobregat, Barcelona.

Dr. Jordi Sunyer
Associate Editor
International Journal of Epidemiology

Dear Dr. Sunyer

We would like to thank you very much for the opportunity to resubmit our manuscript ref.: "IJE-2012-07-0732", entitled "Second-Hand Smoke in Mental Health Care Settings: Time to Implement Total Smoke-Free Bans?" which has been modified in line with the useful referees' comments.

We greatly appreciate the kind editorial and reviewers' comments and suggestions. We enclose a point-by-point response. As requested, modifications in the text of the manuscript have been marked using the "tracked changes" option.

I confirm that the data of this study has not been published previously in a similar form and I also declare that the references have been checked for accuracy and completeness.

Sincerely yours,

Dr. Esteve Fernández

Editor's comments

Following the editors' suggestion, we have removed the statements including terms like "statistically significant" or "significant" (page 6 and 7). We have also included the *key messages* box at the end of the manuscript.

1. In addition to comments from reviewer 3 I have some concern about methodology in the measurement of PM2.5 given that the measuring time is short (between 45 and 90 minutes). The authors should provide evidence that there is no confounding by hour of the day and season.

As described in the Methods section, we did 15-minutes measures in several places in each Unit, and then provide means estimates for all the measurements together, and in some cases, by specific places. A 15-minute period is not a short time, in terms of the likelihood to detect SHS. Usually, studies using this type of portable devices have sampled between 15 and 60 minutes, being 30 minutes an accepted standard. Moreover, no empirical confirmation of its performance against other time sampling frameworks has been tested. We used a 15-minute time given that we were going to perform several measurements within the same unit, and thus 30 minutes per location (within a unit) would results in a not feasible spending of time due to logistic reasons (ie, being measuring during 2.5 hours). Since we wanted to use our measurements both specifically per places and aggregated per units, we opted to perform the 15 minutes period. We have clarified the definition of the sampling time in the Methods section:

(Page 5, last paragraph)

"Every location within each unit was tested for a period of 15 minutes, thus resulting in 45 to 90 minutes measurements at each unit."

And also its implications in the Discussion section:

(Page 10, first paragraph)

Finally, we performed measurements at each unit on a single day with relatively short sampling times, and although other studies have performed similar measurements, longer sampling times may yield proportionately more reliable measurements.

Regarding the season and the hour of the day as potential confounding variables, we performed the measures almost in the same season (November to March) with no huge differences in the outdoor temperature.

We first fitted simple regression models to evaluate the crude association between the independent variables and PM2.5 concentrations, and found that number of cigarettes, type of ban, number of beds, and time of measurement were the variables associated to PMs. Then, we fitted intermediate models adjusting for combinations of several variables to assess the potential mutual confounding effect. In the specific case of "time of the measure", the crude model showed an association between "type of smoking ban" and $PM_{2.5}$ concentration with a β of 0.221 ($p<0.001$), and this coefficient slightly attenuated to 0.212 in the model including our main potential confounders ("number of cigarettes lit" and "time of the measure"). The stratified analysis by "time of the measure" (≤14:00h and >14:00h) showed no effect modification (β=0.199 and β=0.269, respectively). Thus we consider that the association between "type of ban" and PMs was not confounded nor modified by "time of measure", but chose to show the saturated model including the associated variables and also some variables of conceptual importance regardless the magnitude and statistically significance of the coefficients. To better explain the results, we have rewritten the 3rd paragraph of the Results section:

(Page 7, 3rd paragraph)

After assessing the crude associations and checking mutual confounding by the independent variables, we fitted a regression model with several covariates (selected according the magnitude of the coefficients and its conceptual importance). No meaningful confounding effect of "number of cigarettes lighted", "time of measurement" and "ventilation" was observed upon the rest of variables (coefficients changes ranging 4 to 7%). The final model showed that PM2.5 concentrations (living room, main corridor, and staff room combined) were associated with the number of cigarettes lighted during the measurement, the type of smoking ban (increasing concentrations as ban strictness decreased); the number of beds in the unit (higher PM2.5 concentrations in units with more than 30 beds); the time of the measurement (higher PM2.5 concentrations in measurements recorded after 14:00 h); and the presence of smoke extractors or opened windows (Table 3). The model explains 40.3% of the observed PM2.5 variability.

2. Another issue refers to the Public Health impact of this topic. To my view tobacco remains a priority and indoor pollution one of the first environmental risks.

We appreciate the comment and we agree with the editor about the relevance given to second-hand smoke in terms of public health.

Referee 1

This well written manuscript summarizes new research findings on the effectiveness of different levels of bans on smoking in psychiatry units in Catalonia Spain. The study was conducted during the process of the area adopting new regulations on tobacco smoke allowing for variability in policies. The findings indicate that only complete smoking bans (indoor and out) achieved air quality levels in the range recommended by the WHO. All other types of bans had air levels suggesting harmful levels of exposure to SHS. The information has direct clinical, organizational, and policy implications for patients, staff and visitors in inpatient psychiatry.

We appreciate the importance given to this study for its direct implications on clinical and organizational aspects as well as for policy makers, which will be able to support their decisions with objective data.

1. The study examined different types of units: acute inpatient units, sub-acute and medium- and long-stay units, and detox or dual disorder units. The analysis did not examine differences in PM2.5 levels by unit type and that would be of interest.

We appreciate the comment of the reviewer and recognize the interest of the topic. Among the 64 Units in the study, there are 5 types of units (acute; sub-acute; MLE; detoxification; and dual disorders) but also 8 Units sharing different types of patients ("mixed units") with several combinations. Although appealing, we disregarded from the design of the study to look at differences according to the type of unit, because the stratification produces very low numbers in each group. Thus, we prefer not to make more complex the manuscript with this analysis with low statistical power and multiple comparisons.

2. The authors note that PM2.5 is not a specific marker of SHS. It would be helpful to discuss how future studies would improve upon methods with greater specificity for SHS and what additional particulate sources could possibly be contributing to PM2.5 (if any), to give a fuller understanding of this methodological limitation.

$PM_{2.5}$ is not a specific marker of second-hand smoke (SHS) and this has been acknowledged in the manuscript as a potential limitation. The measurement of airborne nicotine concentration is a more specific method of measuring SHS. However, the $PM_{2.5}$ method is more simple, more economic and quicker than the measurement of vapour-phase nicotine through passive sampler devices. These advantages make the $PM_{2.5}$ method more suitable for large samples (241 locations measured in our study).

Moreover, the measurement of $PM_{2.5}$ concentrations has been proven to be feasible when compared with the nicotine, with an almost excellent correlation (r=0.98)[1], and the analyses indicate that 95% of the indoor particulate matter could be attributed to tobacco smoke[2]. In another study we conducted in a large sample of hospitals we also found a high correlation between $PM_{2.5}$ (also using 15 minutes sampling) and airborne nicotine concentration measured during 7 days (r_{sp}=0.64, 95% CI: 0.36-0.82)[3]. The minimal variability that could be observed may be due to traffic/industry pollution. Finally, the economic cost of using airborne nicotine is higher than that of using $PM_{2.5}$, due to the price of the analytical procedures and the time needed to sample –two visits to each Unit: installation and collection of the samplers one week later. Just to illustrate it, the analytical cost of 180 samples for air nicotine represents about €9000 whereas the corresponding $PM_{2.5}$ measurements have a cost of €4500 (the value of the monitor, which can be used for other studies).

Thus, we have clarified the good correlation it in the Discussion section (page 10, 2nd paragraph), and believe not necessary to lengthen it with the "cost-effective" arguments.

[1] Bolte G, Heitmann D, Kiranoglu M, et al. Exposure to environmental tobacco smoke in German restaurants, pubs and discotheques.*J Expo Sci Environ Epidemiol*2008; **18:** 262-71.

[2] Repace J. Respirable particles and carcinogens in the air of Delaware hospitality venues before and after a smoking ban. J Occup Environ Med 2004; **46**:887-905.

[3] Sureda X, Fu M, López MJ, et al. Second-hand smoke in hospitals in Catalonia (2009): a cross-sectional study measuring PM2.5 and vapor-phase nicotine. *Environ Res* 2010; **110:** 750-5.

3. The discussion would be enhanced with mention of recent epi studies indicating an association between SHS exposure and mental health and suicidality.

We appreciate the referee's comment and find appropriate to add a sentence about the association between SHS and mental health in the Discussion section as follows:

(Page 9, line 22)

"Moreover, recent studies suggest an association between second-hand smoke and both psychological distress and risk of future psychiatric illness in healthy adults"

Referee 2

1. This paper is the first to my knowledge with measurements of second-hand smoke exposure in a large sample of mental health care settings. I suggest to accept without revision.

We would like to thank the referee for appreciating the novelty and importance of this study. We hope it will promote further research on SHS and mental health.

Referee 3

1. Page 2, Line 21 Abstract: "We measured air concentrations of particulate matter <2.5 µg/m3 (PM2.5) as a marker of second-hand smoke in different locations at each unit."

Please correct <2.5 µm/m3 (micrometer)

The mistake has been corrected according to referee 3 (Methods section of the Summary). We thank referee 3 for making us aware of these mistakes that erroneously appeared after a "find & replace" action.

2. Page 3, Line 22: "People with mental illnesses have a higher prevalence of smoking than…"

I suggest "…have a higher prevalence of smoking habit than…"

According to the third referee's comment, we have modified the sentence. However we prefer to use "tobacco consumption" instead of "smoking habit", as we are inclined to not refer an addiction with the term "habit" which has a meaning of "common" or "accepted" behaviour.

(Page 3, second paragraph)

"People with mental illnesses have a higher prevalence of tobacco consumption than the general population".

3. Page 5, line 24: "We measured the concentration of respirable suspended particles with an aerodynamic diameter equal to or less than 2.5 µg/m3 (PM2.5 in µg/m3) as a marker of second…"

Please correct "We measured the mass concentration (µg/m3) of respirable suspended particles with an aerodynamic diameter equal to or less than 2.5 µm (PM2.5) as a marker of second…"

The text has been corrected as indicated (Page 5).

4. Page 5, line 26: "Particles emitted from burning cigarettes are in a size range of 0.002–2 µg/m3".

Please correct "… in a size range of 0.002-2 µm".

The text has been corrected as indicated (Page 5).

5. Page 6, line 5: "…which were mainly due to traffic air pollution." Please erase this sentence because it's hard to demonstrate it.

We have only modified the sentence in order to give more information as also suggested by referee 1 about what additional particulate sources could possibly be contributing to $PM_{2.5}$. The sentence has been modified as follows:

(Page 6, line 5)

"We also conducted a control measurement at a location outside of the mental health unit campus in order to register baseline $PM_{2.5}$ levels, which may be originated by traffic air pollution."

6. Page 6, line 5: Was each PM2.5 measure corrected for outdoor PM2.5? If not, consider the suggestion below.

Page 6, line 53: "The geometric mean of the PM2.5 concentrations at control locations, i.e. measured outdoors away from the hospital campuses, was 10.88 µg/m3 (95%CI: 10.26–11.52 µg/m3)". This information should be used to underline the low variability of outdoor PM concentration, in order to strengthen the reliability of indoor measurements in the different premises at different times if single data are not reported as corrected for outdoors.

We would like to thank the referee for this comment as it will strengthen the results of this study. We completed the "limitations section" as follows:

(Page 10, 2nd line)

"Finally, the measurements were performed in the same season but in different geographical areas at different times, however the outdoor $PM_{2.5}$ background concentrations in all the units had a low variability, which strengthens the reliability of the indoor measurements."

7. Page 8, paragraph line 42: For facilities without total smoking ban Authors should also consider "residual tobacco smoke" as an additional contribution to poor indoor air quality (Authors may quote Invernizzi G., Ruprecht A, De Marco C, Paredi P, Boffi R. Residual tobacco smoke: measurement of its washout time in the lung and of its contribution to environmental tobacco smoke. Tobacco Control. 2007; 16:29-33.

We have included this study in order to extend the information:

(Page 8, last paragraph)

"Also, indoor levels of $PM_{2.5}$ slightly increases due to the exhaled air after the last cigarette puff smoked outdoors."

8. Page 9, line 15: please cite also alcohol as a frequent risk factor for mental health patients.

In agreement with this suggestion, we added the alcohol intake as another harmful behavior, as alcohol dependence prevalence in psychiatric patients is twofold the general population. The sentence has been modified has follows:

(Page 9, 3rd paragraph)

"These patients usually present with an unhealthy lifestyle in which heavy smoking, high alcohol intake, poor diet, and physical inactivity has lead to high rates of obesity, hypertension, diabetes, and high blood cholesterol."

9. Page 10, line 57: among limitations of the study, list also the rather short sampling time (15 minutes).

As described in the Methods section, we did 15-minutes measures in several places in each Unit, and then provide means estimates for all the measurements together, and in some cases, by specific places. Thus, we may consider that the sampling period was ranging between 45 and 90 minutes, which is more that the usual 30-

minutes period in other studies. We have clarified the definition of the sampling time in the Methods section:

“Every location within each unit was tested for a period of 15 minutes, thus resulting in 45 to 90 minutes measurements at each unit.”

And also its implications in the Discussion section:

(Page 10, 2nd paragraph)

Finally, we performed measurements at each unit on a single day with relatively short sampling times, and although other studies have performed similar measurements, longer sampling times may yield proportionately more reliable measurements.

Carta d'acceptació del manuscrit

De: *onbehalfof+ije-editorial+bristol.ac.uk@manuscriptcentral.com en nombre de ije-editorial@bristol.ac.uk*
Enviado el: *mar 15/01/2013 10:23*
Para: *Fernandez Munoz, Esteve; Ballbe i Gibernau, Montserrat*
Asunto: *Second-Hand Smoke in Mental Health Care Settings: Time to Implement Total Smoke-Free Bans?*

IJE-2012-07-0732.R1
Second-Hand Smoke in Mental Health Care Settings: Time to Implement Total Smoke-Free Bans?
15-Jan-2013

Dear Dr. Esteve Fernández,

Thank you for returning the above paper which you have revised taking into account the comments of the referees.
I now have pleasure in accepting the paper for publication.

In order to publish your article, Oxford University Press requires that you complete a licence agreement online. A link to the online licensing system, and instructions on how to select and complete a licence, will be provided to you by the Production Editor at Oxford University Press in due course.

You should expect to receive proofs about three months before publication. I would be grateful if you would return them as quickly as possible as we do not publish papers until we have heard from authors. Please keep any changes on proofs to the essential minimum.

From time to time we would like to include illustrations and photographs to accompany and enhance the contents of
the journal. Unless you advise us to the contrary, we shall assume that you have no objection to an appropriate
image being juxtaposed with your contribution. These will be of a general and non-controversial nature. If you have
any suggestions, or indeed any images, which you feel might be appropriate, then we would be pleased to hear from you. Additionally, we do from time to time solicit commentaries to accompany publication of some papers to give a greater perspective.

Yours sincerely
Shah Ebrahim
Editor-in-Chief
International Journal of Epidemiology

Annex 8

Procés editorial de l'article enviat a *Tobacco Control 2014*

Carta de presentació a l'editora

L'Hospitalet de Llobregat (Barcelona), 22 January 2014

Prof. Ruth E. Malone
Editor, Tobacco Control

Dear Ruth,

We would like to submit our manuscript, "**Second-hand smoke in psychiatric units: patients' and staff's misperceptions**" for your consideration in *Tobacco Control* as a research paper.

To our knowledge, this is the first study to compare self-reported levels of exposure to second-hand smoke (SHS) of patients and staff in psychiatric units to objective measures (concentrations of particulate matter of ≤2.5µm), together with their preference for different types of smoking bans. We assessed patients and staff from 65 units in Catalonia, which represents 95.5% of all mental health units in this region (which has 7 million inhabitants).

Even though we found that more than 70% of patients and staff were exposed to SHS (according to World Health Organization's standard recommended levels), they mostly had a significant misperception of this exposure. In many countries psychiatric units are often exempted from smoke-free policies and staff usually prefer partial bans, as shown in the international literature. Moreover, total smoke-free bans in psychiatric units are surprisingly still a topic of debate. Our data show that the low awareness of the staff about the harmful environment in which they do work might have an influence on the preference for less restrictive smoke-free bans.

All authors have carefully read and fully approved the manuscript. On behalf of all authors, I state that the manuscript is original and is not being submitted elsewhere for publication. The authors declare no conflicts of interest.

Correspondence should be addressed to me, as indicated on the title page. Please do not hesitate to contact me if more information is needed or if there are any questions regarding this work.

Thank you very much for your consideration.

Yours sincerely,

Esteve Fernández, MD, PhD
Head, Tobacco Control Unit, Cancer Prevention and Control Programme,
Institut Català d'Oncologia.
Associate Professor of Epidemiology & Public Health,
School of Medicine, Campus de Bellvitge, **Universitat de Barcelona.**

Resposta de l'editora i comentaris dels revisors

El 24/04/2014, a les 20.23, "tobaccocontrol@bmj.com" <tobaccocontrol@bmj.com> va escriure:
> 24-Apr-2014
>
> Dear Dr. Fernandez/Esteve:
>
> Manuscript ID tobaccocontrol-2014-051585 entitled "Second-hand smoke in psychiatric units: patient and staff misperceptions" which you submitted to Tobacco Control, has been reviewed. Following review, the editors have decided that the paper requires revision. We will be happy to reconsider it after revision, providing you have responded to the comments of the referee(s) (see below).
>
> Please note, by offering to reconsider a revised paper, we are making no commitment to publish a revised version.
>
> Important: Please CUT AND PASTE THE REVIEW COMMENTS BELOW INTO A SEPARATE DOCUMENT. With spaces between each comment and your response, provide a specific reply to each reviewer comment, making it clear whether or not you have incorporated the changes as suggested and indicating where the relevant changes are now found in the text. If you elect not to follow reviewers' suggestions or respond to particular criticisms, please provide a response in each case so that the editors might consider your reasoning.
>
> Tobacco Control is published six times per year, and because of the inherent delay in publication with this schedule, we are concerned to avoid overly lengthy periods between notifying authors that a paper needs revision and receipt of the revised version.
>
> If you DO intend to resubmit a revised version, please inform us of the likely submission date.
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the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).
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> You will receive a proof if your article is accepted, but you will be unable to make substantial changes to your manuscript, please take this opportunity to check the revised submission carefully.
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> IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.
>
> Because we are trying to facilitate timely publication of manuscripts submitted to Tobacco Control, your revised manuscript should be submitted before 23-Jun-2014. Your option to submit a revision expires on that date. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission.
>
> We also ask that in addition to the revised paper you provide a point by point response to the reviewer comments, and upload a marked copy of your paper highlighting the changes you have made - preferably 'tracked changes' if using Microsoft word. Please upload this as a supplemental file and label it 'Marked Copy' (your paper will not be able to be processed without this).
>
> All material submitted is assumed to be submitted exclusively to the journal unless the contrary is stated. Submissions may be returned to the author for amendment if presented in the incorrect format.
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> Please note that only the article text (from first word of main text to the last word in reference list) will be used to typeset your article.
>
> All other data (known as the metadata), such as article title, author names and addresses, abstract, funding (etc) statements will be taken from the fields you have filled in at submission, so you must ensure that these are up to date and accurate.
>
> I hope you will find the comments useful.
>
> Respectfully,
>
> Ruth Malone
> Editor-in-Chief, Tobacco Control
> tobaccocontrol@bmj.com
>
> Reviewer(s)' Comments to Author:
>
> Reviewer: 1
>
> Comments to the Author
> An interesting and worthy paper. A few minor comments.
> 1. Did each inpatient unit only receive one visit? If so, perhaps specify this. If more than one visit, how did you prevent a patient from completing more than one questionnaire on different days?
> 2. How were "nurses" defined? The range of professional that can be considered nurses may range from informal training as nursing assistants to doctoral prepared nursing practitioners. If there was a definition, please include. If not, in future studies you may want to develop criteria for such.
> 3. "during admission" may be a bit confusing. While in-patient may be clear. During admission may also mean only the process of admission. As the understanding of this term may vary depending upon country, please clarify only if you feel it will assist the reader.
>
> Reviewer: 2
>

> Comments to the Author
> This is an interesting study on the perception of secondhand smoke exposure among patients and staff in psychiatric units in Catalonia, Spain. Few studies have evaluated exposure to secondhand smoke and opinions about secondhand smoke exposure and smoking bans in psychiatric units. This study fills this important gap.
> Comments:
> 1. Provide a reference and better describe the use of the WHO standard for PM2.5 concentrations in ambient air, indicate what is the duration of reference for this standard, and the adequacy to compare short-term PM2.5 measurements.
> 2. Clarify the impact of the response rates in the opinions and smoking prevalence. For instance, the response rate for physicians was markedly lower compared to nurses.
> 3. The level of support with comprehensive smoking bans seems very low, especially for the staff. Are there comparable studies in other population groups in Catalonia or Spain that could be used to gauge if the differences are specific to psychiatric units or are just related to low levels of support in the general population?
> 4. In the first sentence of the manuscript, be careful with the use of the word “mainly”. Cardiovascular and respiratory effects have been relatively easy to observe because they happen on the short term.
> 5. Page 4, lines 6 to 15: please be careful with the description of the units, especially the other 8 facilities with two different types of units. It is confusing.
> 6. Indicate up front that the questionnaires are self-administered.
> 7. The reporting of the PM2.5 measurements needs to improve. It is unclear how many measurements were collected and how each participant was assigned to each measure. It is also unclear if outside measures were collected to assess background levels and account for those. In the statistical analysis section indicate which statistical measure you are using to summarize the PM2.5 concentrations collected in each venue and if you are reporting the results separately for the living room, main corridor and staff room or combined for each unit. Also, please clarify the statistical analysis strategy used since it seems that the patients and staff are nested within psychiatric units.
> 8. Regarding the name used to describe the type of ban, I suggest using “No ban” rather than “No smoking ban” as “No smoking” can be interpreted as no smoking. With the word “ban” it is a double negative that is very difficult to interpret. Overall, avoid with double negative (e.g. abstract, result section: “the environment was not at all unhealthy”.)
> 9. Overall I found that the Discussion was repetitive of the study findings. It would be better if the authors could put their findings in a broader context, comparing their results with other surveys in similar populations, including studies in clinical settings, or at least with general populations from the same region.
> 10. Overall the manuscript needs to be revised for clarity as well as for language and grammar.
>
> Reviewer: 3
>
> Comments to the Author
> Although addressing an interesting topic, there are a number of statistical issues which should be addressed:
> 1. There is no information about response rates of patients and staff within each unit. The response rate per unit and across units should be computed as (number available - number participating)/number available.
> 2. The analyses do not account for the sampling strategy used in the study. The unit of selection was the facility and responses are clustered within units. Thus, "unit" should serve as a random factor in the models. It is clear that participant responses are not independent. For instance, staff within units are more likely to respond similarly, on the average. This dependency should be modeled in the analyses.
> 3. The range of outcomes across units is not provided.
> 4. The data are highly dependent on the location of the study. For instance, the rate of smoking among physicians in the study is quite high. Thus, the author should emphasize that the findings may be unique to the study setting.


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