Prevalence of health problems among children and the role of health education in promotion of healthy habits

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Abstract

Purpose – Kindergarten children are more susceptible to diseases as they are still in the process of acquiring immunity. The purpose of this study was to assess kindergarten teachers' and parents' perception of the prevalence of health problems among children in Kuwait and the role of health education in promotion of healthy habits.

Design/methodology/approach – The methodological aim of this study was to assess the factors that affected kindergarten children's health as children suffered from health problems that affected their quality of life. Therefore, a questionnaire was administered to evaluate kindergarten teachers' and parents' perception of the main factors that caused increased health problems among children at higher rates than before. A total of 164 teachers and parents were recruited for this study and the questionnaire was completed.

Findings – The results indicated that kindergarten children suffered from different health problems that affected their quality of life. Lack of health knowledge and education in the society was one of the main reasons for the prevalence of these health problems among young children in Kuwait. The findings offered insight about the importance of health education and promotion in prevention of diseases.

Originality/value – This study offers insights into how to increase health knowledge and education in the Kuwaiti community to prevent and decrease health problems that affect children's health.

Keywords Prevalence, Health problems, Health education, Promotion, Children

Paper type Research paper

Introduction

Young school-aged children are busy discovering the world through parental contact, exploration, play and interactions with teachers at school as well as other adults. The richer the environment of the child with healthy surroundings and potential experiences, the better it is for the child. Parents must provide support for several aspects of a child's development due to the fact that a child has physical, psychological and social needs. The World Health Organization (WHO, 2015) defines health as the state of physical, mental and social well-being and not just the absence of disease or infirmity. Children need to be surrounded by a healthy environment, where cleanliness and safety are of utmost importance. It is also imperative that children be surrounded by emotionally stable people who are capable of providing them with their basic needs, balanced meals and adequate sleep and encouraging them to take part in physical activities (Linda *et al.*, 2007).

Teachers' professional training and experience with children make them more skillful than most parents in detecting changes in a child's health status. Additionally, teachers are childcare workers who are able to detect departures from normal health (Young and Valois, 2010). Teachers work with their students on a regular basis, guiding them through various learning experiences which allow them to better differentiate and notice when a student is not

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feeling well. The child's health influences his or her behavior in school and the quality of school work. Teachers never assume medical responsibility, they can tell if there is something wrong with a child. Teachers are alert to the early symptoms of acute illness as well as to the signs which may indicate that some underlying health problem could be developing (Frances and Eleanor, 1995). Their skill comes from their knowledge of student health and depth of experience and from studying the growth and development of children.

The prevalence of overweight or obesity among children is high, and health risks associated with childhood obesity pose a critical health challenge (Koplan *et al.*, 2005). Another prevalent health problem is iron deficiency anemia (IDA), which is one of the most common nutritional deficiencies in the world, with infants and young children being the most affected. As estimated by the World Health Organization, about 1.62 bn people suffer from anemia and 50% of preschool children are affected by anemia (the highest prevalence) (Debonist, 2015; WHO, 2015). Another prevalent disease is type 1 diabetes which affects children aged 0–14 years, and it is more commonly referred to as juvenile or childhood-onset diabetes. The cause of diabetes is not known, but it may be the result of genetic and environmental factors.

The role of health education in promotion of healthy habits

Health education should be integrated into the curriculum of educators and parents throughout Kuwait. The most effective way to do so would be by conducting seminars for teachers and parents on the most prevalent health problems that children are facing. These programs should be offered to teachers and parents to educate them about the prevention of the spread of health problems among children (Edberg, 2015). It is very important to offer health seminars and workshops for kindergarten teachers and parents about the most common health problems that affect children's health as well as consolidating the concept of health education in the prevention of diseases (Salazar *et al.*, 2013). The lack of health awareness in the society and the lack of sanitary conditions in school buildings both affect children's health, and they are two of the main reasons that cause different health problems (McKenzie *et al.*, 2013).

The purpose of this study was to evaluate parents and kindergarten schoolteachers' perception of the prevalence of health problems among children in Kuwait as well as the role of health education in promoting healthier habits. This research aimed to influence the health attitudes and behaviors of teachers and parents and to enlighten them about the main factors that caused health problems among children in Kuwait that affect the quality of their life.

The research methodology

A questionnaire was used to rate parents and teachers' perception of the prevalence of diseases and other health problems among kindergarten children in Kuwait. The topics of the questionnaire were selected in accordance with the factors most closely associated with commonly reported health problems among children, health attitudes and behaviors of teachers and parents toward children's health in Kuwaiti society and the role of health education in promotion of healthy habits. The questionnaire was administered to 164 participants, 43.3% of whom were kindergarten teachers and 56.7% were parents. Computer data entry and analyses were made using Statistical Package for Social Sciences (SPSS, 2012). The questionnaire consisted of four sections. The first section was made up of demographic information such as age (20–30 or 31+ years), city (Kuwait City or Ahmadi city), relation to the child (parent or teacher), educational level (bachelor's degree or high school diploma) and experience (no experience, 1–3 years, 4+ years). Out of the six cities in Kuwait, Kuwait City and Ahmadi city were selected according to the variance each living environment provides as

well as the societal differences present in each city. Kuwait City is the capital of Kuwait and is composed of a highly educated society, and the city provides a higher quality of life to its population. Ahmadi city has a more diverse population because it serves as a major hub for the oil industry, which brings people from all over the world to work there. Additionally, parents and teachers who responded to the questionnaire were affiliated with governmental schools in the two selected cities. Governmental schools were selected for the study because they had the highest rates of Kuwaiti children enrolled compared to private schools. The second section of the questionnaire aimed to rate, on a Likert scale, teachers' and parents' perception of the most common factors that caused health problems among young children in Kuwait, which were selected for evaluation. The third section aimed to rate, on a Likert scale, teachers' and parents' perception of parameters selected for measuring health education in promotion of healthy habits. Responses to the questionnaire were rated on a five-point Likert scale as follows: 1: strongly agree, 2: agree, 3: agree to some extent, 4: disagree and 5: uncertain. The fourth section measured the frequency and percentage of occurrence of most common health problems among kindergarten children in Kuwait. Cronbach's alpha reliability coefficients were 0.825 and 0.670, indicating high reliability and, thus, a high internal consistency between these concepts. The validity was measured based on the research objectives and was found to be in accordance with the Kuwaiti population's attitudes and perceptions of health. The questionnaire was revised by several professors who aided in the creation of the final version. Their recommendations included some deletions and modifications of minor aspects of the questionnaire.

Findings

Table 1 indicates that 56.7% of the sample are parents and 43.3% are kindergarten teachers; moreover, 55.3% of the sample are aged between 20 and 30 years and 44.8% are aged 31 years and above. Representative samples were collected from two cities, Kuwait City (44.5%) and Ahmadi city (55.5%). Regarding the educational level, most participants had a bachelor's degree (67.5%), while 32.5% had a high school diploma. In regard to teaching experience,

Characteristics	No. of respondents	Percentage (%)
Age		
20–30 years	89	55.3
31+ years	72	44.8
Area		
Kuwait City	73	44.5
Ahmadi city	91	55.5
Relation to the child		
Parents	93	56.7
Teachers	71	43.3
Educational level		
Bachelor's degree	110	67.5
High school diploma	53	32.5
Experience in teaching		
No experience	93	56.7
1–3 years	25	15.2
Four years and above	46	28.0

Table 1. Demographic characteristics of respondents

Table 2.
Rating teachers' and parents' perception on a Likert scale for selected health problems

Variables	Percentage (%) 1	2	3	4	5
Kindergarten children are more vulnerable to diseases	29.3	32.3	26.2	9.8	2.4
Heredity plays a major role in the health problems of children	33.5	28.7	25.6	8.5	3.7
The ignorance of teachers about the prevalence of health problems	49.4	26.2	17.7	4.9	1.8
Most kindergarten children suffer from health problems	16.6	27.8	29.4	23.9	3.1
The lack of regularity of periodic medical examination exposes children to diseases	45.1	30.9	17.9	3.7	2.5
Children's suffering from psychological and social problems health	48.2	34.1	12.8	3.0	1.8
Ignorance of teachers and parents of the child's characteristics and needs increases health problems	39.3	31.3	17.2	8.0	4.3
Lack of cooperation between parents and teachers in solving children's problems	44.2	29.4	20.9	1.8	3.7
Malnutrition is an important contributing factor to health problems	68.1	21.3	7.4	2.5	3.1

15.2% of participants had 1–3 years of experience, while 28.0% of participants had four or more years of experience.

Table 2 shows the rating of teachers' and parents' perceptions on a Likert scale for selected health problems that kindergarten children encountered in Kuwait. The answers were rated according to a five-point Likert scale as follows: 1: strongly agree, 2: agree, 3: agree to some extent, 4: disagree and 5: unsure. The results revealed that 68.1% of the respondents strongly agreed that malnutrition was an important contributing factor to most health problems, while 49.4% strongly agreed that teachers' ignorance about the health problems that affected kindergarten children was an important factor. Additionally, 48.2% of participants strongly agreed that the fact that some children suffered from psychological and social problems affected their health, 45.1% strongly agreed that lack of regularity of periodic medical examination exposed children to diseases, and 44.2% strongly agreed that there was a lack of cooperation between parents and teachers in solving children's problems. Furthermore, 39.3% of the respondents strongly agreed that teachers' and parents' ignorance about the child's characteristics and needs at this stage increased the incidence of health problems, 33.5% strongly believed that heredity played a major role in the occurrence of health problems in children and 32.3% agreed that kindergarten children were more vulnerable to diseases.

Table 3 shows the rating, on a Likert scale, of teachers' and parents' perception of parameters selected for measuring the role of health education in promotion of healthy habits and prevention of health problems among children. The answers were rated on a five-point Likert scale as follows: 1: strongly agree, 2: agree, 3: agree to some extent, 4: disagree and 5:

Table 3.
Rating teachers' and parents' perception on a Likert scale for parameters selected for measuring health education

Variables	Percentage (%) 1	2	3	4	5
Lack of health awareness in society is the main reason for health problems	59.1	26.2	11.6	2.4	0.6
Lack of sanitary conditions in school buildings affects children's health	43.6	27.6	17.8	5.5	5.5
I agree to integrate health education into the curriculum	53.4	26.4	14.7	2.7	3.1
I agree to offer cultural lectures to increase awareness about children's health problems	51.9	29.0	17.3	1.2	0.6
Teachers' experience is important to qualify them to teach children health education	44.7	29.8	16.8	5.6	3.1
I agree to offer health seminars and workshops for kindergarten teachers to become more aware of the concepts of health education	58.8	23.9	11.7	2.5	3.1

unsure. Most of the respondents (59.1%) strongly agreed that the lack of health awareness in the society was one of the main reasons for the spread of health problems among children, and 58.8% strongly believed that it was important to offer health seminars and workshops for kindergarten teachers to become more aware of the concepts of health education and its role in the prevention of diseases. Furthermore, 53.4% agreed that it was necessary to integrate health education into the curriculum, 51.9% agreed that it was important to give cultural lectures to increase awareness about children's health problems, 44.7% strongly believed that teachers' experience was important to qualify them to teach health education to children and 43.6% strongly agreed that the lack of sanitary conditions in school buildings affected children's health.

Table 4 shows the frequencies and percentages of occurrence of the most common health problems among kindergarten children in Kuwait. It was found that 35.4% of kindergarten children suffered from urinary incontinence, 20.1% were overweight or obese, 14.0% were affected by IDA, 11.5% had different health problems, 9.8% suffered from diabetes, 3.7% had frequent diarrhea, 2.4% had convulsions, 1.8% had chickenpox and 1.2% had pulmonary problems.

Discussion

Malnutrition was found to be the main factor that caused different health problems among kindergarten children. Lack of cooperation between teachers and parents in solving children's health problems and their ignorance of children's characteristics and needs were also found to be contributing factors. The results revealed that children suffering from psychological and social problems were more vulnerable to diseases. Parents are not aware of the importance of periodic medical examinations and this lack of awareness exposes children to diseases. The lack of health awareness in the society and the lack of sanitary conditions in school buildings affect children's health and they are two of the main reasons that cause most health problems (McKenzie *et al.*, 2013).

Additionally, in terms of a child's health, each teacher should be familiar with the physiological and psychological differences between children at each age level and the simple tests or screenings required to find out if something is wrong with the child.

This study found that a high percentage (47.0%) of kindergarten children in Kuwait suffered from urinary incontinence. Landgraf *et al.* (2004) reported that urinary incontinence affected both the child and the family on several levels. According to Ertan *et al.* (2009), nocturnal enuresis is three times more common than daytime wetting, and it is three times more common among boys and is a source of embarrassment for the affected child (Assiri *et al.*, 2007; Ertan *et al.*, 2009; Esposito *et al.*, 2011). According to Al-Zaben and Sehlo (2015), parental punishment for children for bedwetting is associated with childhood depression and

Health problems	Frequency	Percentage (%)
Obesity or overweight	33	20.1
Urinary incontinence	58	35.4
Children's diabetes	16	9.8
Convulsions	4	2.4
Anemia	23	14.0
Chickenpox	3	1.8
Frequent diarrhea	6	3.7
Pulmonary problems	2	1.2
Different health problems	19	11.5
Total	164	100.0

Table 4. Percentage of occurrence of health problems among kindergarten children

reduced quality of life. There is a relationship between parental punishment, depression and quality of life in children with primary nocturnal enuresis. Deshpande *et al.* (2011) reported that children with urinary incontinence showed severe psychosocial impairment. Can *et al.* (2004) found that the punitive approach was an inappropriate way to manage enuresis and punishment should be prevented.

The study revealed that 20% of kindergarten children in Kuwait were overweight or obese and this could cause them additional health problems like asthma, joint problems, depression, anxiety or sleep apnea (NIHCMF, 2001). School health services can play a central role in addressing obesity-related issues among students by providing educational health information to students. US schools offer many opportunities for obesity prevention strategies by providing children with nutritious food (Action for Healthy Kids, 2005). Several interventions have changed school policies regarding vending machine items in schools, which aim to reduce the fat content and add more fruits and vegetable items to these machines (Fox *et al.*, 2004). Interventions are just beginning to target efforts to encourage physical activity in addition to the availability of healthy foods for children at schools to prevent them from becoming overweight (Mary *et al.*, 2006). The health services at each school can also help address obesity and other health problems by providing screenings and educational information regarding students' health.

Additionally, the results indicated that 14.0% of children in Kuwait were anemic. Iron deficiency and its associated anemia (IDA) were more common among children on poor diets (Mclean *et al.*, 2009). Anemia affects psychomotor development and physical growth in children (Sandoval, 2018). It may cause developmental delays and behavioral disturbances according to the US Department of Health and Human Services (USDHHS, 2011). Anemia is a multifunctional clinical disease that results from inappropriate nutritional habits and poor supplementation of the essential factors involved in the production of red blood cells (Righetti *et al.*, 2012).

The results indicated that 9.8% of kindergarten children suffered from type 1 diabetes, a prevalent disease among Kuwaiti children aged 0–14 years and it is more commonly referred to as juvenile or childhood-onset diabetes. The cause of diabetes is not known, but it may be the result of genetic and environmental factors.

Type 1 diabetes occurs when the pancreas is unable to produce enough insulin, a hormone that regulates blood sugar. Without insulin, sugar cannot be transferred from the blood to the cells and this results in high blood sugar levels. Some children suffer from psychological or social problems which affect their physical health (Kimberly *et al.*, 2016). The prevalence of type 1 diabetes has doubled in the last two decades (Shaltout *et al.*, 2016; Valerio *et al.*, 2019). Low serum vitamin D status is associated with high prevalence and early onset of type 1 diabetes in children (Majedah *et al.*, 2016).

The study indicated that it was important to offer health seminars and workshops for kindergarten teachers to become more aware of the concepts of health education and its role in the prevention of diseases and integrate health education into the curriculum. The study also showed that it was important to give cultural lectures to increase awareness about the health problems of children.

Conclusion

This study aimed to examine teachers' and parents' perception of the most common factors that were closely associated with commonly reported health problems among young children in Kuwait and to determine their perception of the parameters selected for measuring health education to prevent and decrease the occurrence of health problems among children. It was found that a high number of kindergarten children in Kuwait suffered from different health problems that might affect their quality of life. Malnutrition was found to be one of the main health problems that affected children's health, and it was important to create advisory

committees made up of parents and teachers to recommend physical activity and nutrition standards for children. Teachers' ignorance about dealing with health problems was found to affect children's health.

The results revealed that children suffering from psychological and social problems were more prone to different health problems. Additionally, in terms of a child's health, each teacher should be familiar with the physiological and psychological differences between children at each age level and the simple tests or screenings required to find out if something is wrong with the child.

It was found that most parents were not aware of the importance of the regularity of periodic medical examinations, which exposed their children to diseases. The lack of health awareness in the society and the lack of sanitary conditions in school buildings affected children's health and these were two of the main reasons that caused most health problems (McKenzie *et al.*, 2013). Lack of cooperation between parents and teachers in solving children's problems played an important role in affecting children's health. Teachers' and parents' ignorance about children's characteristics and needs affected their health. Kindergarten children are more vulnerable to different kinds of health problems and parents and teachers' ignorance about the methods of prevention of diseases was found to be the main cause of these problems. It is very important that teachers and parents discuss children's health problems. Also, the lack of cooperation between them and the lack of understanding of children's characteristics and needs at this stage will increase the incidence of health problems**.** Another important finding of this study was that a high percentage of kindergarten children in Kuwait suffered from urinary incontinence. Some of the most common health problems observed included overweight or obesity, which might cause additional health problems like asthma, joint problems, depression, anxiety or sleep apnea (NIHCMF, 2001). Health education programs should be introduced to promote healthy nutrition and to prevent future risk of overweight-related diseases among children. This study revealed new important facts about the prevalence of other health problems between young children in Kuwait, mainly IDA and diabetes. These health problems are being observed at higher rates than ever before. The outcome of this study is of great concern to public health. We recommend integrating educational health concepts into the curriculum and offer health seminars and workshops to kindergarten teachers and parents to become more aware of the concepts of health education and its role in the prevention of diseases. These recommendations would instill in the community a sense of health awareness about problems that children are facing.

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Prevalence of COPD by age, sex, socioeconomic position and smoking status; a cross-sectional study

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Abstract

Purpose – The purpose of this study is to calculate gender and socioeconomic status (SES) inequalities in chronic obstructive pulmonary disease (COPD) in Greater Glasgow and Clyde and measure the proportion of inequalities explained by smoking.

Design/methodology/approach – Medical records until May 2016 were linked to mortality data to measure COPD prevalence. Population estimates for smoking status were calculated by merging three (2013–2015) Scottish Household Survey rounds. Poisson regression was carried out to analyse the relationship between SES and gender inequalities in COPD, and smoking.

Findings – Crude COPD prevalence for ages 16+ years was 3.29% and for ages 45 years+ was 6.26%, and higher in females than males. Adjusting for age and sex, prevalence of COPD in the most deprived quintile was 4.5 times of that in the least deprived. Adjustment for smoking explains almost half of the relative difference between Scottish Indicator for Multiple Deprivation (SIMD) 1 (least affluent quintile of deprivation) and SIMD 5 (most affluent quintile) and a fifth of the absolute difference. There is a higher risk of COPD among male non-smokers than female, but among smokers the risk is greater for females than males.

Research limitations/implications – Risk factors specific to respiratory health beyond smoking and common risk factors of morbidity more generally should be considered in understanding inequalities in COPD.

Originality/value – Prevalence of COPD is higher than previously thought. Smoking explains less than half of inequalities in COPD. Gender inequalities in COPD are dependent on smoking status and the smoking indicator used.

Keywords Smoking, COPD, Scotland, Socioeconomic inequalities, Gender inequalities, Glasgow

Paper type Research paper

Introduction

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease with high symptom burden and mortality rates. Globally, it is the third leading cause of death for females and males aged over 60 years, and the sixth and fourth leading cause of disability among females and males respectively aged over 60 years (United Nations, 2015). In 2016, it was the fourth leading cause of premature death in Scotland, after ischaemic heart disease, lung cancer and cerebrovascular disease, with a higher age-standardised rate than all other parts of the United Kingdom (Institute for Health Metrics and Evaluation, 2016). COPD is one of several ambulatory care sensitive conditions (ACSCs), identified by National Health

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Service (NHS) England as having effective management and treatment options in primary care that should prevent emergency admission to hospital (Purdy *et al.*, 2009). Nevertheless, one in five emergency admissions in England is for an ACSC (Blunt, 2013), and this proportion is greater among the elderly (Tian *et al.*, 2012). Blunt (2013) found that COPD was the cause of 12% of all ACSC emergency admissions and that rates of COPD emergency admission did not change significantly between 2002 and 2013, despite several initiatives being directed at managing COPD symptoms in the community.

COPD has previously been shown to be patterned by socioeconomic status (SES) and gender. Reported gender inequalities however vary by country. Whereas prevalence remains greater among males in Norway, Germany, Italy and Spain (Bhatta *et al.*, 2018; Landis *et al.*, 2014), recent increases among females have been observed in several high-income countries, resulting in an equalisation of rates, and in some countries including USA and Australia, COPD prevalence is now higher among females than males (Landis *et al.*, 2014; Ntritsos *et al.*, 2018). The rise in COPD among females is thought to be due to a rise in the prevalence of female smoking with some evidence to suggest that females develop COPD with a lower exposure to smoking than men (Buist *et al.*, 2007; Sorheim *et al.*, 2010). Previous research has found that among smokers, females' lung function declines at an accelerated rate as they age compared with that of males (Gan *et al.*, 2006). Prolonged smoking duration is also more strongly associated with COPD prevalence among females than males (Liu *et al.*, 2015). Between 1990 and 2016, the proportion of deaths attributable to COPD in Scotland among those aged 70 years+ rose for females by 1.58% and fell for males by 1.12% (Institute for Health Metrics and Evaluation, 2016).

Socioeconomic inequalities in COPD have also been described. A systematic review found that most studies showed that for a range of COPD outcomes, individuals living in the lowest SES strata were at least twice as likely to have poor outcomes than those from the highest and that this ranged between no difference and a tenfold difference (Gershon *et al.*, 2012). In the United Kingdom, deprivation is associated with increased emergency health care use, costs and mortality (Collins *et al.*, 2018). Globally, socioeconomic inequalities are explained by a range of factors including smoking rates, poor nutrition and pollutant exposure related to employment (Mannino and Buist, 2007). However, in the United Kingdom, smoking is considered an important modifiable determinant of SES inequalities of COPD (British Lung Foundation, 2017). The prevalence of COPD increases with age for men and women (Buist *et al.*, 2007). In the United Kingdom, it is rare among those aged under 40 years and becomes commoner with age, affecting 9% of those aged over 70 years (Snell *et al.*, 2016).

Within Western Europe, Glasgow is known to have poor health outcomes, with average life expectancy more than six years below the UK average for men and more than four years below for women (Office for National Statistics, 2011). Although half of the Glasgow City population lives in the lowest quintile of deprivation (Glasgow Centre for Population Health, 2016), deprivation only partially explains geographical inequalities in health (Landy *et al.*, 2012). Glasgow also has a relatively young population with 13.6% aged over 65 years, compared with 19.1% in the rest of Scotland (National Records of Scotland, 2017). While elsewhere in Scotland the population has been ageing for the last two decades, this has only been observed in Glasgow since 2011. Historically, Scotland has had poor respiratory health outcomes, with particularly low lung cancer survival rates (Gregor *et al.*, 2001). Although these have improved, large geographic variation in respiratory health persists in the United Kingdom, with particularly poor outcomes in Scotland (Hansell *et al.*, 2016).

In his report on preventable admissions, Blunt (2013) concludes that policy should focus efforts at finding initiatives that will reduce COPD emergency admissions. In order to target a condition, it is useful to measure the prevalence within a population and to determine subgroups of the population most at risk. Previous attempts to measure the prevalence of disease in the Scottish population have proven difficult. For example, a report on dementia found incidence rates to be twice as high as originally thought (Scottish Government, 2016).

Similarly, reported prevalence measures of COPD in Scotland are believed to be underestimates, particularly where the disease is mild (Scottish Public Health Observatory, 2017).

Previous research has described socioeconomic and gender inequalities in COPD within countries and globally, within World Health Organization subregions (Mannino and Buist, 2007; Ntritsos *et al.*, 2018). In the United Kingdom, tobacco smoking is believed to be a main cause of these inequalities (British Lung Foundation, 2017). This study aims to measure prevalence of COPD by age, sex, Scottish Indicator for Multiple Deprivation (SIMD) and smoking status in Glasgow City. A second aim is to measure the extent to which gender and socioeconomic inequalities in COPD are explained by smoking status. The importance of tackling health inequalities alongside population health has been described previously (Marmot, 2010). Measuring the impact of smoking on inequalities in COPD gives an indication of what can be achieved by targeting smoking as a risk factor and also what cannot.

Methods

The population of Scotland receives free medical care through the NHS. Primary care is provided by the general practitioner (GP) who examines patients, prescribes medicine and refers patients to secondary care departments where appropriate. In April 2004, the Quality and Outcomes Framework (QOF), a national incentive scheme for meeting target thresholds, was introduced in Scotland as part of the General Medical Services (GMS) contract (Roland and Guthrie, 2016). Locally enhanced services for COPD collected patient information from primary care practices under QOF. This scheme was abandoned in April 2017.

Data

COPD data collected under QOF for patients resident in NHS GGC until May 2016 were analysed. Patient records were linked to mortality data to allow calculation of prevalence of COPD in May 2016. COPD prevalence was calculated by sex, age group (ten-year age bands) and SES using patient postcode to assign a SIMD quintile (Scottish Government, 2012). The QOF collected data included patient's age, sex, postcode, smoking status, Medical Research Council (MRC) dyspnoea grade as a measure of breathlessness and the forced expiratory volume (FEV1) lung function measure. Data was made available via the safe haven at the University of Glasgow.

Population data collected by NRS (National Records of Scotland, 2017) were used to calculate the prevalence of COPD by age and sex. Additionally to calculate population estimates of SIMD quintiles and smoking status for NHS GGC, data from three cross-sectional Scottish Household Surveys (SHS) (Scottish Government, 2015) were obtained for the years 2013, 2014 and 2015. Nationally representative household samples are surveyed in each year with information collected by face-to-face interview; where the highest income householder or their partner is asked about their household and members and an additional random adult from the household is interviewed on a range of topics. The sample is representative for most outcomes at the local authority level. NHS GGC samples were 2,341, 2,341 and 2,283, for each of the years respectively, with a sum total of 6,965 across all three years. Ever and current smoking status was established using three survey questions. The first asked respondents "Do you smoke cigarettes nowadays?", the second asked "About how many cigarettes a day do you smoke?" and the third asked "Have you ever smoked cigarettes regularly? By regularly I mean at least one cigarette a day", with optional responses "Yes" or "No" to the first and third question. If respondents answered "No" to the first question, they were coded as current non-smokers. If they answered "Yes" or greater than 0 to the second question, they were coded as current smokers. If respondents answered "Yes" to the third question, they were coded as ever having smoked. If they responded "No", they were coded as never having smoked.

Data set representativeness

The QOF data would have been representative of the population as information was collected until March 2016 at a national level and though voluntary, almost all of GPs in Scotland collect some QOF data. Diagnosis of COPD was required to be carried out using spirometry testing under the QOF. The SHS collects information by face-to-face interview. The SHS is designed to provide information representative at subnational local authority level and permit disaggregation of information in terms of geography and subgroup (Scottish Government, 2015). In order to allow for analysis of data by age and sex, three years of data were combined. Combining years of data sets to produce larger samples is discussed in the SHS Technical Report (Scottish Government, 2015). Of the NHS GGC SHS sample, 6.4, 7.3 and 8.2% of 2013, 2014 and 2015 SHS respondents were excluded due to missing age and sex information (Table 1). A further small number of cases (approximately 0.5%) were excluded from the complete case data set due to missing information regarding ever having smoked. The proportion of remaining respondents in each SIMD quintile was approximately that of the data sets with missing cases, so that that those missing from the complete case data set were spread evenly across all SIMD quintiles, suggesting no obvious SES bias caused by missingness. Furthermore, proportions by SIMD are very similar to those reported elsewhere for NHS GGC (NHS Greater Glasgow and Clyde, 2017). Proportions of males and females according to the national register data (National Records of Scotland, 2017) were also similar, while proportions by age suggested the sample to be under-representing younger ages (NRS describes 33.3% of the population aged 16+ years to be aged under 35 years, compared with 23.6% of the sample) and over-representing those aged 55–84 years (31.9% of population figures compared with 40.9% of the sample). Survey weights are assigned as instructed in the SHS Technical Report (Scottish Government, 2015).

Statistical analysis

Population estimates for current and ever smoking population by ten year age group, sex and SIMD were calculated by applying the proportions of the aggregated 2013, 2014 and 2015

		Sample[a]
n (%)		6,235
Sex	Men	2,962 (47.5)
	Women	3,272 (52.5)
Age	16–24	957 (15.4)
	25–34	1,100 (17.6)
	35–44	960 (15.4)
	45–54	1,120 (18.0)
	55–64	879 (14.1)
	65–74	701 (11.2)
	75–84	402 (6.5)
	85+ years	115 (1.8)
SIMD quintile	SIMD 1 (most deprived)	2,257 (36.2)
	SIMD 2	1,129 (18.1)
	SIMD 3	931 (14.9)
	SIMD 4	829 (13.3)
	SIMD 5	1,088 (17.5)
Current smoking status	Smoker	1,396 (22.4)
	Non smoking	4,838 (77.6)
Ever smoking status	Ever smoked	2,862 (45.9)
	Never smoked	3,372 (54.1)

Note(s): [a]Complete case 2013, 2014 and 2015 SHS data sets merged

Table 1. Summary statistics for NHS GGC Scottish Household Survey sample

SHS data sets to the population of NHS GGC in 2016. QOF records were merged with death registry data allowing for prevalence of COPD to be calculated. COPD prevalence was calculated by age group, sex, SIMD and smoking status, also collected by QOF. Prevalence rates were calculated by sex and SIMD separately, standardising for age and smoking status; age, sex and smoking status; and age, SIMD and smoking status, using direct standardisation methods. 95% confidence intervals were calculated for standardised rates using Dobson *et al.* (1991)'s method. Prevalence was compared before and after adjustment for smoking status. The data were modelled for outcome COPD using Poisson regression with population as an offset term. The model adjusted for age, sex, SIMD and smoking status, adding an interaction term between smoking status and sex and smoking status and SIMD. Statistical analysis was performed using SPSS.

Results

The crude prevalence for the NHS GGC population aged 16+ years was 3.29%, and among those aged 45 years+ it was 6.26%, higher in females 6.52% than males, 5.95%. NHS GGC has a higher proportion (36%) of people living in the most deprived quintile of deprivation compared with the rest of Scotland (Table 1). Almost half of the population has smoked at some point in their life and 22% are current smokers. Crude prevalence of COPD and smoking for all and by sex is presented in Table 2. COPD prevalence rates were higher for men than women at older ages. But for the 45–54 and 55–64 age groups, prevalence among women was significantly greater than that of men. Prevalence of current smoking was higher among younger than older age groups for both males and females, for example, 21.0% (18.5%, 23.5%) of females aged 16–34 currently smoked compared with 10.5% (7.2%, 13.8%) aged 75 years+. The prevalence of ever smoking among females, however, increased with age until age group 65–74 years, followed by a decrease thereafter, while among males, ever smoking increased with age; for individuals aged 85+ years, prevalence of ever smoking in men was more than double that of 16–24 year olds and almost double that of women aged 85+ years; 78.7% (65.3%, 92.1%) compared with 39.9% (29.1%, 50.7%).

The large majority of COPD patients reported previously smoking; 92.3% of females and 93.2% of males, while approximately 41.8% of both male and female COPD patients reported currently not smoking (not shown). Crude prevalence of COPD, current smoking and ever smoked in SIMD 1 (most deprived) was, respectively, 3.4, 4.1 and 1.6 times that of SIMD 5 (least deprived). After adjustment for age and sex, socioeconomic inequalities in COPD increased, with a SIMD 1 prevalence of COPD 4.5 that of SIMD 5 (Table 3). However, after adjustment for age, sex and current [ever] smoking, prevalence of COPD in SIMD 1 was 2.6 [2.8] that of SIMD 5. Adjustment for smoking therefore explained almost half of the relative difference between SIMD 1 and SIMD 5 and a fifth of the absolute difference.

Relative risk of COPD decreased with increasing affluence for those not current smoking and also for those who had never smoked, with less of a gradient for the latter (Table 4). To calculate the relative risk, the beta values shown in Tables 4 and 5 must be exponentiated so that for example in Table 4, the risk of COPD for those aged 25–34 years, relative to those aged 16–24 years, is $\exp(1.48) = 4.39$ with a 95% confidence interval of $\exp(1.48 \pm 1.96*0.38) = (2.09, 9.25)$. A positive beta value indicates a greater risk relative to the reference group while a negative beta value indicates a lower risk. Additionally, the relationship between deprivation and COPD was less pronounced for current smokers compared with current non-smokers. There was no difference in the association between deprivation and COPD for those who had ever smoked when compared with those had not.

After adjustment for age and SIMD, there was no significant difference between males and females in COPD prevalence; 36.26 (35.73, 36.80) per 1,000 among males compared with 35.43 (34.92, 35.94) per 1,000 among females (Table 3). Adjusting for current smoking, COPD prevalence among males was greater than that of females; however, adjustment for ever

Table 2.
Crude prevalence of COPD and smoking status (%)

Age	COPD			Ever smoked			Current smoking		
	All	Male	Female	All	Male	Female	All	Male	Female
16–24 years	0.006 (0.002, 0.01)	0.006 (0.0001, 0.01)	0.006 (0.0001, 0.01)	27.76 (24.92, 30.59)	27.66 (23.65, 31.66)	27.86 (23.85, 31.88)	19.27 (16.78, 21.77)	19.91 (16.33, 23.49)	18.64 (15.15, 22.12)
25–34 years	0.03 (0.02, 0.03)	0.03 (0.02, 0.05)	0.02 (0.01, 0.03)	37.67 (34.81, 40.54)	36.78 (32.73, 40.82)	38.57 (34.52, 42.63)	22.82 (20.34, 25.30)	22.73 (19.22, 26.25)	22.92 (19.42, 26.42)
35–44 years	0.31 (0.28, 0.33)	0.33 (0.29, 0.37)	0.28 (0.24, 0.32)	49.15 (45.98, 52.31)	51.17 (46.62, 55.72)	47.20 (42.81, 51.59)	24.04 (21.33, 26.74)	25.65 (21.67, 29.63)	22.48 (18.81, 26.15)
45–54 years	1.77 (1.71, 1.83)	1.66 (1.57, 1.75)	1.87 (1.78, 1.95)	48.03 (45.11, 50.96)	50.78 (46.54, 55.02)	45.55 (41.52, 49.59)	26.74 (24.15, 29.34)	27.83 (24.03, 31.63)	25.76 (22.21, 29.30)
55–64 years	5.30 (5.18, 5.41)	4.71 (4.55, 4.86)	5.84 (5.67, 6.01)	51.59 (48.28, 54.89)	52.41 (47.66, 57.15)	50.82 (46.22, 55.43)	24.09 (21.26, 26.91)	24.92 (20.81, 29.03)	23.31 (19.42, 27.20)
65–74 years	9.94 (9.76, 10.13)	9.76 (9.50, 10.03)	10.10 (9.85, 10.35)	61.34 (57.74, 64.95)	65.46 (60.30, 70.62)	57.71 (52.71, 62.71)	19.87 (16.92, 22.82)	20.38 (16.01, 24.75)	19.42 (15.42, 23.42)
75–84 years	12.77 (12.51, 13.02)	13.51 (13.09, 13.92)	12.26 (11.93, 12.59)	52.47 (47.60, 57.35)	62.54 (54.84, 70.23)	45.63 (39.47, 51.79)	11.97 (8.80, 15.14)	13.16 (7.79, 18.54)	11.16 (7.27, 15.06)
85+ years	10.45 (10.06, 10.84)	12.55 (11.80, 13.30)	9.48 (9.03, 9.93)	52.14 (43.01, 61.27)	78.71 (65.34, 92.08)	39.92 (29.12, 50.72)	9.71 (4.30, 15.12)	11.17 (0.88, 21.46)	9.04 (2.71, 15.36)

Table 3. COPD prevalence, crude and standardised

	COPD prevalence per 1,000 population and 95% CI			
	Crude prevalence	Age and sex standardised	Standardised by age, sex and ever smoked	Standardised by age, sex and current smoking
SIMD 1 (most deprived)	50.55 (49.82, 51.27)	50.55 (49.82, 51.27)	50.55 (49.82, 51.27)	50.55 (49.82, 51.27)
SIMD 2	34.44 (33.58, 35.29)	34.26 (33.41, 35.11)	40.30 (39.38, 41.22)	41.18 (40.25, 42.11)
SIMD 3	23.30 (22.52, 24.08)	24.80 (24.00, 25.60)	27.41 (26.57, 28.26)	37.99 (37.01, 38.97)
SIMD 4	17.58 (16.86, 18.30)	16.56 (15.86, 17.26)	21.51 (20.72, 22.30)	30.90 (29.95, 31.85)
SIMD 5	14.83 (14.25, 15.40)	11.19 (10.69, 11.69)	17.55 (16.92, 18.18)	19.25 (18.60, 19.91)

	Crude prevalence	Age and SIMD standardised	Standardised by age, SIMD and ever smoked	Standardised by age, SIMD and current smoking
Female	35.43 (34.92, 35.94)	35.43 (34.92, 35.94)	35.43 (34.92, 35.94)	35.43 (34.92, 35.94)
Male	30.19 (29.69, 30.68)	36.26 (35.73, 36.80)	34.27 (33.74, 34.79)	37.52 (36.98, 38.07)

Current smoking		Beta	SE	*p*-value
Sex (Ref: Female)	Male	−0.01	0.01	0.449
Age (Ref: 16–24 years)	25–34 years	1.48	0.38	<0.001
	35–44 years	3.93	0.36	<0.001
	45–54 years	5.70	0.35	<0.001
	55–64 years	6.86	0.35	<0.001
	65–74 years	7.54	0.35	<0.001
	75–84 years	7.91	0.35	<0.001
	85+ years	7.77	0.35	<0.001
SIMD (Ref: SIMD 1)	SIMD 2	−0.41	0.02	<0.001
	SIMD 3	−0.76	0.02	<0.001
	SIMD 4	−1.09	0.03	<0.001
	SIMD 5	−1.39	0.03	<0.001
Smoker (Ref: No)	Yes	0.79	0.02	<0.001
SIMD*Smoker interaction (Ref: SIMD 1, non-smoker)	SIMD 2*Smoker	0.34	0.03	<0.001
	SIMD 3*Smoker	0.47	0.04	<0.001
	SIMD 4*Smoker	0.65	0.05	<0.001
	SIMD 5*Smoker	0.62	0.05	<0.001
Ever smoking		**Beta**	**SE**	***p*-value**
Sex (Ref: Female)	Male	−0.12	0.01	<0.001
Age (Ref: 16–24 years)	25–34 years	1.26	0.38	0.001
	35–44 years	3.55	0.36	<0.001
	45–54 years	5.34	0.35	<0.001
	55–64 years	6.41	0.35	<0.001
	65–74 years	6.95	0.35	<0.001
	75–84 years	7.28	0.35	<0.001
	85+ years	7.28	0.35	<0.001
SIMD (Ref: SIMD 1)	SIMD 2	−0.22	0.06	<0.001
	SIMD 3	−0.52	0.07	<0.001
	SIMD 4	−0.67	0.07	<0.001
	SIMD 5	−1.06	0.06	<0.001
Smoked (Ref: No)	Yes	2.33	0.03	<0.001
SIMD*Smoked interaction (Ref: SIMD 1, never smoked)	SIMD 2*Smoked	−0.08	0.06	0.164
	SIMD 3*Smoked	−0.16	0.07	0.026
	SIMD 4*Smoked	−0.24	0.07	0.001
	SIMD 5*Smoked	−0.02	0.07	0.763

Table 4.
Parameter estimates under the Poisson model for outcome COPD prevalence, adjusting for sex, age, SIMD, current smoking status and ever smoked and an interaction between smoking and SIMD

smoked resulted in a male prevalence of COPD significantly lower than that of women, 34.27 (33.74, 34.79) per 1,000 compared with 35.43 (34.92, 35.94). Modelling the data with a sex and smoking status interaction term describes a higher risk of COPD among male non-smokers than female, though among smokers the risk is greater for females than males (Table 5). A significant and positive relationship between smoking and COPD exists, and this relationship is significantly stronger for females than males.

Discussion

COPD is difficult to diagnose without the use of spirometry. Even with spirometry in its early stages, patients with COPD may not attend a GP. Methods of measuring prevalence of COPD therefore likely underestimate the true rate. Cigarette smoking is considered to be the most important determinant for the development and progression of COPD (Eisner *et al.*, 2010). This is the main risk factor for COPD, and smoking rates have previously been used to

Current smoking		Beta	SE	*p*-value
Sex (Ref: Female)	Male	0.04	0.01	0.018
Age (Ref: 16–24 years)	25–34 years	1.47	0.38	<0.001
	35–44 years	3.91	0.36	<0.001
	45–54 years	5.68	0.35	<0.001
	55–64 years	6.84	0.35	<0.001
	65–74 years	7.53	0.35	<0.001
	75–84 years	7.90	0.35	<0.001
	85+ years	7.77	0.35	<0.001
SIMD (Ref: SIMD 1)	SIMD 2	−0.26	0.02	<0.001
	SIMD 3	−0.57	0.02	<0.001
	SIMD 4	−0.89	0.02	<0.001
	SIMD 5	−1.21	0.02	<0.001
Smoker (Ref: No)	Yes	1.02	0.02	<0.001
Sex*Smoker interaction (Ref: Female, non-smoker)	Male*Smoker	−0.10	0.02	<0.001
Ever smoking		**Beta**	**SE**	***p*-value**
Sex (Ref: Female)	Male	0.08	0.04	0.047
Age (Ref: 16–24 years)	25–34 years	1.26	0.38	0.001
	35–44 years	3.56	0.36	<0.001
	45–54 years	5.35	0.35	<0.001
	55–64 years	6.41	0.35	<0.001
	65–74 years	6.96	0.35	<0.001
	75–84 years	7.29	0.35	<0.001
	85+ years	7.28	0.35	<0.001
SIMD (Ref: SIMD 1)	SIMD 2	−0.30	0.02	<0.001
	SIMD 3	−0.66	0.02	<0.001
	SIMD 4	−0.88	0.02	<0.001
	SIMD 5	−1.08	0.02	<0.001
Smoked (Ref: No)	Yes	2.35	0.03	<0.001
Sex*Smoked interaction (Ref: Female, never smoked)	Male*Smoked	−0.22	0.04	<0.001

Table 5. Parameter estimates under the Poisson model for outcome COPD prevalence, adjusting for sex, age, SIMD, current smoking status and ever smoked and an interaction between smoking and sex

estimate COPD prevalence (Nacul *et al.*, 2007; Stang *et al.*, 2000). However, this is not the only risk factor. Moreover, the current study shows that while smoking is associated with COPD, the relationship between smoking and COPD varies, dependent on sex and SES and on the measure of smoking status used.

The study found that SES inequalities in COPD were strongest among current non-smokers. This supports the theory that smoking explains inequalities in COPD. However, current smoking explained under half the relative difference in COPD between the most and least affluent, while ever smoking had little if any impact on inequalities in COPD. These findings suggest that targeting smoking can only hope to reduce at most half of socioeconomic inequalities in COPD. In addition, the study shows that caution should be used when employing smoking rates as a proxy for COPD prevalence, particularly when studying subpopulations. Furthermore, the definition of smoking status used is likely to determine study results.

The study showed that the relationship between smoking and COPD is stronger for females than males. This is in line with previous research that found that females develop COPD with a lower exposure to smoking than men (Han *et al.*, 2007; Sorheim *et al.*, 2010). A stronger association between smoking and health among females has been observed previously for other conditions (Lee *et al.*, 2011). However, the smoking status definition is

critical. The current study found that COPD was more prevalent among males than females when adjusting for current smoking, but more prevalent among females than males when adjusting for ever smoked. This suggests that smoking behaviour, perceived behaviour and/or interpretation of the question differ by gender. Although the SHS attempts to minimise missingness and bias, gender difference in interpretation of survey questions, perception of health risk and in reporting have been described previously (Green *et al.*, 2001; Kim *et al.*, 2018). Males may be less likely to describe infrequent smoking as current smoking, thus underestimating male smoking prevalence. The frequency, quantity of smoking and length of time they have smoked for have also not been included in the smoking measure. It may be that males have been smoking for longer, smoke more frequently or smoke a greater number of cigarettes, exposing them to a higher risk of COPD.

Gender differences also exist in attendance at GP clinics, with males less likely to attend (Jatrana and Crampton, 2009). Bias in attendance among COPD patients might equate to bias in extent of disease or in number of morbidities experienced by the patient, so that smoking males are more likely to present in the GP surgery than non-smoking and therefore be diagnosed, while the same may not be true of females. Additionally, there is a body of evidence that shows bias against spirometry testing in women (Barbagelata *et al.*, 2018) and in diagnosing COPD even when using spirometry (Camp and Goring, 2007; Han *et al.*, 2007). Gender bias in clinical decision-making for other health outcomes and in practitioner-perceived risk taking has been described previously, with a higher implicit association for males (Daugherty *et al.*, 2017). Additionally there are gender differences in the presentation and development of disease which might explain underdiagnosis and/or misdiagnosis, for example, of asthma, among females (Barbagelata *et al.*, 2018), as well as gender differences in the phenotypic response to smoking (Han *et al.*, 2007). One or more of these factors might explain a higher prevalence of COPD among males than females after adjustment for current smoking.

COPD prevention has primarily focussed on targeting smoking, as this is believed to be the primary determinant of COPD in high-income countries (Burney *et al.*, 2014). The current study found that 7% of patients with COPD had never smoked and a further 35% were current non-smokers. Within these groups both gender and SES inequalities were evident. There is therefore an argument for understanding the cause of inequalities in COPD beyond smoking. It is perhaps not surprising that inequalities exist given SES inequalities exist for the many other health outcomes. Determinants of COPD beyond smoking include poor housing and occupational and environmental exposures, such as biomass smoke, as well as dietary factors and a history of asthma (Barbagelata *et al.*, 2018; De Marco *et al.*, 2011; Hansell *et al.*, 2016). Risk factors specific to respiratory health, as well as those considered to be common factors for morbidity more generally, may explain excess inequalities beyond those caused by smoking, and it is recommended that future studies consider causes of inequalities beyond smoking.

Strengths and limitations

Prevalence of COPD calculated using primary care data is almost certainly an underestimate; in an Austrian study of a population-based sample, only 5.6% of those affected by COPD had received a diagnosis by their doctor (Schirnhofer *et al.*, 2007). Previously it has been shown that prevalence calculated using physician diagnoses is greater than those reported by the patient, but lower than those reported via spirometry methods (Ntritsos *et al.*, 2018). Spirometry methods were used in this study optimising GP recording, a strength of the study. Nevertheless, even these methods are likely to underestimate COPD (Bednarek *et al.*, 2008). Furthermore, there may be gender differences in this underestimate as there are known

gender differences in attendance at GP office (Jatrana and Crampton, 2009). Date of commencement or date of quitting smoking in the sample is not known so using these data, those who quit a week prior to the survey would be counted as equivalent to those who quit 20 years before. We therefore did not consider the impact of quitting on COPD prevalence or inequalities of COPD; however, this is recommended for future research, given the known benefits of smoking cessation (US Department of Health and Human Services, 1990; WHO, 2020).

The current study did not consider the impact of secondary source smoking, that is, living with someone who smoked. As inequalities exist in smoking, there are also inequalities in exposure to second-hand smoke (Akhtar *et al.*, 2010). The impact of smoking presented in the current study is therefore likely to be an underestimate. However, it is unlikely that second-hand smoking explains the remaining 50% of unexplained relative inequalities. It is recommended that future studies consider the impact of second-hand smoke on COPD prevalence and inequalities in COPD.

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Impact on staff of the Mentally Healthy Schools Framework

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Abstract

Purpose – The Mentally Healthy Schools Framework (MHSF), based on the population-wide Act-Belong-Commit mental health promotion campaign, is a whole-school approach primarily targeting student mental health, but it is also intended for staff. This paper presents the results of an impact survey on staff after the implementation of the Framework in a number of schools in Western Australia.
Design/methodology/approach – A baseline questionnaire was completed by $n = 87$ staff at schools that had just signed up to the programme, and a participant questionnaire was completed by $n = 146$ staff at schools that had been participating for at least 17 months.
Findings – The results show that the Framework has had a substantial impact on many staff in terms of increased mental health literacy and taking action to improve their mental health.
Originality/value – Mental health interventions in schools generally focus on students' well-being and how to deal with student mental health problems. There are few comprehensive interventions that also include staff well-being.

Keywords Health promoting schools, School mental health, Mental health promotion, Project evaluation
Paper type Research paper

Introduction

In an earlier article in this journal, we described the Mentally Healthy Schools Framework (MHS) that was based on the population wide Act-Belong-Commit mental health promotion programme adapted to a school setting via the WHO's Health Promoting Schools Framework (Anwar-McHenry *et al.*, 2016). That paper reported a process evaluation of the initial implementation of the Framework. This paper reports on an impact evaluation of the Framework on staff in schools implementing the Framework (the impact on students is currently in preparation).

Given that many mental health problems and disorders have a peak age onset in childhood or adolescence (McGorry *et al.*, 2007), it is widely acknowledged that schools are an important setting for mental health promotion to prevent mental health problems (Power *et al.*, 2008). Hence, the focus on mental health promotion in schools is primarily on programmes for improving the students' mental health, with little attention paid to including activities or constructs for staff mental health (e.g. see Slee *et al.*, 2012; Svane *et al.*, 2019). Where staff programmes do exist, they are often just separate workshops or guidelines about dealing with school matters that may cause stress to staff.

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However, the mental health and well-being of teachers is an occupational health concern. Work-related stress can affect productivity, job satisfaction and even workplace violence (Quick and Tetrick, 2011). Amongst teachers, work-related stress is a major risk factor for mental health issues such as anxiety and depression (Chan, 2002; Johnson *et al.*, 2005; Kyriacou, 2001). Further, teachers' mental ill-health may impact students' learning, inhibit the development of supportive teacher-student relationships and influence teachers' ability to recognise and support the mental health needs of their students (Kidger *et al.*, 2009; Sisask *et al.*, 2014). In particular, students from disadvantaged backgrounds, who are at a greater risk of developing mental illness (Reiss, 2013), may rely more heavily on their teachers for emotional support. Consequently, an additional burden is placed on teachers to manage these vulnerable students, creating a further source of workplace stress and distress (Rothi *et al.*, 2008).

Given recent findings on the mental health of school teaching staff reporting higher levels of psychological distress than in the general population (Stapleton *et al.*, 2020), there is a clear need for school programmes to consider targeting the mental health of staff. The MHSF introduced in Western Australia uses the WHO guidelines for Health Promoting Schools (Quirke, 2015) to embed the "Act-Belong-Commit" community-wide mental health promotion campaign into the school setting. This whole- school approach aims to improve the mental health not only of students but also of teachers and other staff. The whole-school approach shifts the focus from mental ill-health to the promotion of a culture of mental health and well-being that is prioritised across the whole school community (Sisask *et al.*, 2014).

The Act-Belong-Commit programme and the MHSF have been described in detail (Anwar-McHenry *et al.* (2016)). However, we present brief descriptions of these below.

The Act-Belong-Commit community-wide campaign

Act-Belong-Commit is a comprehensive community-based mental health promotion campaign designed to build mental health and prevent mental illness in people (Donovan and Anwar-McHenry, 2014; Donovan *et al.*, 2006). The campaign encourages individuals to engage in mentally healthy activities, while at the same time using a social franchising approach to support and encourage organisations that offer mentally healthy activities to promote and increase participation in these activities (Donovan, 2021). The campaign is directed by Mentally Healthy WA (MHWA) at Curtin University, and implemented through partnerships with health services, local/state governments, schools, workplaces, community organisations and local clubs.

As the brand name suggests, people can build positive mental health and resilience by keeping physically, mentally, spiritually and socially active (Act); keeping up contacts with friends and family and participating in community events (Belong); and taking on challenges or causes that provide meaning and purpose in their lives (Commit). There is substantial evidence that these three domains contribute to increasing levels of positive mental health (and, in fact, to physical health) (Donovan and Anwar-McHenry, 2014; Santini *et al.*, 2017, 2018).

The Act-Belong-Commit campaign's fundamental messages are also consistent with recent broader conceptions around mental health literacy (Kutcher *et al.*, 2016), in that they are designed to increase positive mental health by enhancing people's understanding of factors that impact on mental health and empowering them to take action to improve and maintain their mental health.

The Act-Belong-Commit Mentally Healthy Schools Framework

The MHSF encourages a whole-school approach to mental health promotion through the three domains of the WHO's Health Promoting Schools Framework. The MHSF seeks to

increase knowledge and skills of school staff to create mentally healthy school environments, to change both staff and student behaviour and attitudes with respect to mental health and mental illness, strengthen community links with the school, enhance meaning and purpose of activities and events in which the students already participate and increase student connectedness to, and teacher morale within, the school (Anwar-McHenry *et al.*, 2016).

Schools receive promotional strategies and resources targeting the whole school community. The flexible programme is self-sustaining and complements areas of the Australian curriculum, allowing schools freedom to tailor the MHSF to school priorities and needs, thus minimising the burden on staff. Partner schools engage in formal training conducted by Act-Belong-Commit and receive a copy of the Mentally Healthy Schools Handbook, resources, signage and merchandise to the value of $150 to assist with the delivery of the MHSF.

In 2016 and 2017, surveys of staff and students at participating secondary schools were undertaken using structured self-completion questionnaires. This paper reports on the staff survey findings.

Methods

Sample

Commencing in 2016, secondary schools that had either recently signed up or who had been a partner for at least 17 months were invited to participate in the impact evaluation. Of the 20 schools meeting these criteria, nine agreed to distribute questionnaires to staff and/or students in the time frame allowed for schools to respond to the request. Eight of these nine schools distributed questionnaires to staff.

The schools forwarded the questionnaire plus consent form to their staff via email for printing and self-completion. The Act-Belong-Commit Schools Project Officer attended several staff meetings and distributed and collected a number of self-completed questionnaires. All survey respondents had the opportunity to go into a draw to win a prize as an incentive for completion of the questionnaire. Data collection occurred from late 2016 to mid-2017.

Questionnaires

A "baseline" questionnaire was completed by staff at schools that had just signed up for the programme, and a "participant" questionnaire was completed by staff at schools that had been participating for at least 17 months. This report focuses on the participant survey results, with comparisons to the baseline survey results where appropriate.

Both questionnaires covered the same topics, beginning with several general questions about mental and physical health, and then focusing on awareness and understanding of the Act-Belong-Commit campaign in general; awareness of the school's involvement in the Act-Belong-Commit MHSF; whether those aware of the campaign had tried to do something for their mental health as a result of the campaign; whether, and, if so, how it had changed the way they think about mental health; whether they had talked about mental health and/or the campaign with their students, other staff, friends and family; and whether they believed that the campaign at the school had increased openness about mental health amongst staff and students and decreased stigma around mental illness. There were 24 topic questions along with three background questions (position at the school, age, gender) (see Anwar-McHenry *et al.*, 2018 for baseline and participant questionnaires for students and staff).

This research was granted ethics approval from Curtin University's Human Research Ethics Committee (Approval RDHS-216–15) and the Department of Education (Approval D16/0023499).

Results

Sample characteristics

A total of 146 staff from six schools that had been implementing the MHSF for at least 17 months completed staff "participant" questionnaires, and 87 staff from two schools that had only recently signed up as Act-Belong-Commit partners completed "baseline" staff questionnaires. Approximately half of all respondents were in the age bracket of 30–49 years, two-thirds were female and just over 70% were teaching staff.

Campaign awareness and understanding

Both "baseline" and "participant" respondents were asked: "*Have you heard of the Act-Belong-Commit campaign?*" Consistent with annual state-wide population surveys (Lin *et al.*, 2020), 77% of baseline respondents reported being aware of the campaign, whereas awareness amongst the participant respondents was 92%. That is, their school's involvement in the Act-Belong-Commit campaign appears to have increased staff awareness of the campaign.

Those aware of the campaign were asked, "*What does Act-Belong-Commit mean? What is the campaign trying to do?*" Both baseline and participant responses were consistent with the campaign messages: "keep active, 'do something'; 'join a club or group', 'get involved in community', 'bring people together', 'have purpose', commit to goals".

Campaign impact on behaviour

Did something for their mental health as a result of the campaign. When those aware of the campaign were asked whether they had done or tried to do something for their mental health as a result of becoming aware of the Act-Belong-Commit message, approximately twice as many participant respondents as baseline respondents responded "yes": 43 vs 21%. Even allowing for a sampling bias, these data indicate that the campaign has had a significant impact on staff in the schools where the MHSF has been implemented for some time.

Talked with others about mental health or the campaign. When participant respondents aware of the campaign were asked whether, as a result of the campaign, they had talked *more* about mental health with various others, almost half reported talking *more* about mental health with friends and/or family (48%) and other school staff (45%). Also, 41% reported talking about Act-Belong-Commit with family and friends and 39% reported talking about Act-Belong-Commit with students. These results indicate that the MHSF has stimulated increased openness about talking about mental health in these schools.

Impact on beliefs about mental health. Impact on how they think about mental health: When participant respondents aware of the campaign were asked whether they "had changed the way they think about mental health as a result of the Act-Belong-Commit message", just over two in five (43%) staff responded "yes". When asked "in what way their thoughts had changed", their responses generally related to one or more themes such as an increased awareness and clearer understanding of mental health, being more proactive about keeping mentally healthy, being encouraged to engage in self-help activities and being more willing to talk about mental health issues and support others experiencing problems.

Perceived impact on openness around mental health: Participant respondents were asked whether they thought the Act-Belong-Commit campaign *at the school* had made staff and students more open about mental health issues, less open or made no difference. These results are shown in Table 1, which shows that almost two-thirds of participant staff (62%) believed the campaign had made *students* more open about mental health issues, and just under half believed the campaign at the school had made *staff* more open about mental health issues. For each case, none said, "less open", with approximately one in four stating "do not know".

Perceived impact on stigma around mental illness: Baseline and participant respondents aware of the campaign were asked whether they thought the campaign in general or at the

school, respectively, had reduced, increased or made no difference to the stigma associated with mental illness. Their responses are shown in Table 2, which indicates that the campaign at the school has likely had a substantial impact on perceived (and hence actual) stigma reduction, with 65% of participant respondents nominating a stigma reduction impact at the school versus 46% of baseline staff nominating a stigma reduction impact in general. Further, there was a correspondingly substantial decline in "do not know" from 36% "in general" to 18% "at the school". None reported a perception of increased stigma.

Staff attitude to the campaign at their school

Participant respondents were asked how they felt about their school's involvement in the Act-Belong-Commit campaign and were provided with the response categories: *Very much approve; Approve; No feelings either way; Disapprove; Very much disapprove*. Almost 90% approved of the school's involvement (61% "very much"), 10% were "neutral" and none "disapproved".

Discussion

As a result of the campaign in the general community, there was substantial prior awareness of the Act-Belong-Commit campaign amongst baseline respondents: 77%. However, amongst participant respondents, awareness was almost universal: 92%. Further, those aware of the campaign had understandings of the campaign that were consistent with the campaign messages (e.g. "take part in activities", "bring people together", "commit to a cause"). These data indicate that the schools' intervention increased not only awareness of the Act-Belong-Commit campaign among staff in participating schools but also mental health literacy in these staff.

General population impact evaluations tend to report that 12–18% of those aware of the campaign have tried to do something for their mental health as a result of exposure to the

	Perceived impact on student openness about mental health issues	Perceived impact on staff openness about mental health issues
More open	62	44
No difference	13	21
Less open	0	0
Do not know/ cannot say	24	27
Not stated	1	8
	100%	100%

Table 1. Perceived impact of Act-Belong-Commit campaign at the school on student and staff openness about mental health issues

	Baseline – in general % Aware (n = 67)	Participant – at school % Aware (n = 135)
Reduced stigma	46	65
No difference	18	16
Increased stigma	0	0
Do not know/cannot say	36	18
Not stated	0	1
	100%	100%

Table 2. Perceived impact of the campaign on stigma around mental illness

campaign. The baseline percentage of staff was somewhat higher than the general population at 21%, but considerably higher amongst participant staff at 43%. While the absolute percentages may reflect some respondent selection bias and we do not have pre-intervention data for the participant respondents, this substantial increase amongst participant staff can be taken as consistent with an intervention effect. In addition to enhancing staff mental health, these participant staff results are very positive given that staff are role models for their students and that staff who internalise and act on a message are then far more likely to promote that message to their students than those staff who only endorse the message.

As in the general population evaluation, the schools' intervention is also facilitating staff talking about mental health and/or the Act-Belong-Commit campaign with friends, family, students and colleagues. Hence, it may well be that a module dealing with "talking to students about Act-Belong-Commit/mental health" could be developed and provided to staff to guide these interactions in a more effective manner.

Just under half of participant staff (43%) reported changing the way they think about mental health, and in desired ways such as an increased awareness about mental health, an increased importance placed on mental health and in taking up activities for their mental health. These data reinforce the conclusion that the MHSF intervention has the potential to contribute significantly to staff being proactive about strengthening and maintaining their own mental health.

Similarly, the results with respect to perceived reduction of mental illness stigma and increased openness with respect to mental health issues have longer-term implications for increased early help-seeking behaviours, and hence the prevention of more serious disorders.

None of the staff disapproved of their school's involvement with Act-Belong-Commit and almost 90% "approved", with just under two-thirds registering *strong* approval. These data indicate that wider dissemination of the school programme would be looked on very favourably by staff.

Conclusions

The findings of this initial evaluation indicate that the Act-Belong-Commit MHSF intervention has considerable potential for having a positive impact on staff mental health and hence resilience to stress. All staff aware of the campaign had a good understanding of the campaign messages, a substantial proportion had taken action to enhance their mental health as a result of exposure to the messages and substantial proportions reported a decreased stigma around mental illness and an increased self-efficacy with respect to their mental health. Subsequent studies should include pre-post comparisons, formal measures of mental health literacy and validated scales to directly assess changes in mental health and well-being.

Overall, these and other results indicate that the Act-Belong-Commit MHSF has the potential to provide a means to simultaneously enhance mental health of both staff and students.

Limitations of this report

This report is primarily an impact evaluation of the initial implementation of the MHSF, not an outcome evaluation. Within that context, results for the baseline and participant surveys should be looked at independently rather than considered equivalent to a study reporting on the same sample of individuals measured at baseline and follow-up.

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