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2 **Major risk factors for sexual minority young people's mental and physical health:**
3 **findings from a county-wide school-based health needs assessment**
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Abstract

Background Childhood health is an important adult health predictor. Sexual orientation is increasingly recognised as influential on children and young people's (CYP) mental and physical health.

Methods Data came from a cross-sectional survey of year 9 children attending schools in two local authorities in the north-west of England, including mental and physical health indicators, and demographic characteristics including sexual orientation. The sample of 8,058 represented 67.8% of the eligible population. Data were analysed by sexual orientation; sexual majority or sexual minority.

Results Children reporting their sexual orientation as sexual minority reported worse mental and physical health outcomes and behaviours than sexual majority peers; had higher odds of being lonely (OR 8.24, 95%C.I. = 6.56-10.37), having self-harmed (OR 7.28, 95%C.I. =5.78-9.15), being bullied (OR 4.76, 95%C.I. = 3.74-6.05) or perceiving themselves as overweight (OR 2.40, 95%C.I. =1.89-3.06).

Conclusions It is important to identify and support children in a sexual minority. Research is required to understand differences between children within sexual minorities and the impact on outcomes and rights. Health and social policy and services, should respond to the vulnerabilities of sexual minority CYP.

Background

Childhood and adolescent health are important predictors of adult health and are seen as key policy drivers in the United Kingdom and internationally.^{1,2,3,4} Addressing poor mental and physical health outcomes are a “valuable investment for the health of the population”.⁵

The impact of a range of socio-economic factors on childhood and adolescent health outcomes is well researched and there is an emerging international evidence base for the importance of sexual orientation as a key factor contributing to the children and young people’s (CYP) mental and physical health.^{6,7,8} CYP whose sexual orientation puts them in a minority group have been found to be more likely to have poor mental and physical health outcomes than other CYP.^{9,10,11,12,13,14,15,16,17,18,19,20} International studies have shown that sexual minority CYP have higher rates of suicide ideation, self-harm and depression.^{8,10,11} In terms of physical health, studies conducted in the US have shown lower levels of physical activity in sexual minority boys and higher levels of obesity in sexual minority girls suggesting an intersection with gender that requires additional exploration.¹⁷

Explanations for the drivers of the differences are currently tentative. They are generally seen to relate to the prevalence of homophobic and transphobic attitudes, at individual and social levels, that make membership of a sexual minority unsafe and vulnerable in a range of public social spaces.²¹ School environments in particular have been found to regulate sexuality and gender norms and treat transgressions from these norms as problematic.²² The impact of bullying, discrimination and a lack of affirmation constitute particular risks to mental health and well-being and can impede participation in physical activities.²³

The data source for this study is a routine school health needs assessment in two local authorities in the north-west of England. This is a relatively unique dataset as it is not a requirement for schools or health services in the UK to conduct a health needs assessment in schools. This survey has been conducted in approximately 500 schools for six years. Questions relating to sexual orientation were added in September 2016. In 2016, nearly 70% of all year 9 (13-14 years of age) pupils enrolled in schools across the local authorities participated in the survey. This constitutes a large and representative sample which adds to the limited evidence base in the UK and internationally. The data is

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2 collected to inform service provision across localities and within individual schools and
3 clinical care to individual pupils. This accounts for the challenges we faced when analysing
4 the data. We have maximised the potential of this data, recognising that data collected
5 specifically for research purposes would allow more flexibility and rigour in the analysis.
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11 Throughout the paper the phrase 'sexual minority' is used to describe all young people
12 who described themselves as lesbian, gay, bisexual or transgender. We recognise that
13 this obscures the differences within this group of CYP. However this paper is seeking to
14 understand the mental and physical health implications of minority sexuality among this
15 large, school based sample. We are currently exploring the differences within the sexual
16 minority group of young people.
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23 **Methods**

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25 We used data from a cross-sectional survey conducted between September 2016 and
26 June 2017 among year 9 children (13-14 years of age) attending secondary schools in two
27 local authorities in north-west England. The survey forms one component of an annual
28 participatory school health needs assessment (SHNA) of primary and secondary schools
29 undertaken by government health services for school age CYP. All primary and secondary
30 schools served by community-based health services of Lancashire Care NHS Foundation
31 Trust were asked to engage pupils in the survey. The sampling frame for this data was all
32 year 9 pupils.
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41 The survey tool collected named data about personal characteristics (ethnicity, sexual and
42 gender identity). We took a pragmatic approach to defining the categories, using
43 vocabulary thought to be most likely understood by this age group in this region, with thirty
44 predominately binary questions (49 items), about access and experience of health care,
45 healthy behaviours and risk-taking, emotional and mental health, carer responsibilities,
46 exposure to violence and bullying, sexual and reproductive health, and self-protection. The
47 survey was constructed using validated questions from existing domestic and international
48 tools. Local development and field-testing of questions was undertaken where appropriate
49 equivalents could not be found. Questions have been annually reviewed and refined in a
50 multi-stakeholder process over six years.
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2 When surveying CYP below 16 years it is usual to seek parental consent for participation.
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4 However it was successfully argued, based on Articles of the UN Convention on the Rights
5 of the Child,²⁴ that the majority of 13-14 year olds would be competent to make the
6 decision to participate or not by themselves, once furnished with appropriate information.
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8 Once their position as primary consenters was established, it would be wrong to approach
9 someone else for their consent. Therefore year 9 pupils alone determined their
10 participation with the exception of a few pupils with unclear self-consent competence. They
11 had either further explanation to assist them attain competence, or where this was not
12 possible parents or carers were approached for consent.
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19 To prepare pupils for making an informed choice, in the preceding week the school nurse
20 gave pupils explanatory information verbally in a special assembly and in an appropriately
21 written information sheet. This contained frequently asked questions about the survey's
22 purpose, what happened with the information and how it was protected. Participation was
23 encouraged but voluntary. CYP were assured there was no penalty for non-participation.
24 CYP were assured individual findings would not be shared with the school without their
25 permission and would be held in their confidential health service records; collated
26 anonymised data would be shared with schools and health planners.
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35 In total 8,026 year 9 pupils participated (3,901 girls; 4,009 boys; 24 who reported
36 themselves as 'Other' in relation to gender), representing 67.8% of all year 9 pupils on
37 school rolls. The identification with the gender category "other" had no impact on analyses,
38 as groups for analyses were determined based on sexual orientation responses only.
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44 Completed surveys were returned to the school nurses. They were triaged to identify
45 individual pupils requiring follow-up. Next, anonymised data was entered into a web-based
46 electronic database, collated in Excel, and then exported to SPSS.
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51 Data were analysed using SPSS Statistics 22 and 24 (SPSS, Inc., Chicago, IL, USA).
52 Tests were conducted to identify potential acquiescence bias. Response rates for
53 individual items and demographic characteristics were assessed. Demographic variables
54 were compared using cross-tabulations. Variables assessing summed counts in related
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2 item categories were created. Bullying was assessed together with mental health. After
3 testing of assumptions, comparisons of data and odds ratios (OR) were calculated using
4 Chi-squared analyses, multinomial logistic regressions, t-tests, and Mann-Whitney tests.
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9 Analyses comparing responses to multiple incompatible items (such as behaviours
10 indicative of healthy habits and behaviours indicative of less healthy habits) showed that
11 less than 1% provided answers that suggested they were acquiescing rather than
12 providing authentic answers.
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18 **Results**

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20 Demographic characteristics (ethnicity, sex, sexual and gender identity) and cross-
21 tabulations by sexual orientation can be found in Table 1. The number of individuals who
22 did not respond to the sexual orientation item (n=232, 3%) defined the maximum number
23 for subsequent analyses as 7,794 (instead of the 8,026 in the total sample). Ultimately,
24 7440 (95%) sexual majority individuals' responses and 354 (5%) sexual minority
25 individuals' responses were used in analyses.
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31 *(Table 1 here)*
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33 Items were analysed individually, shown in Table 2, and as composite measures (for
34 indicators of mental and physical health) in order to further understand the associations
35 between health outcomes and sexual orientation, shown in Table 3.
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39 *(Table 2 here)*
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41 Significant differences were found between the number of males and females who
42 identified as sexual majority or sexual minority ($X^2(1) = 43.95, p<.000$), with more females
43 identifying as sexual minority. The number of sexual minority or sexual majority individuals
44 who identified with their gender at birth was also significantly different ($X^2(1) = 311.64,$
45 Fisher's exact test=.000), with more sexual majority individuals identifying with their gender
46 at birth. Finally, the number of individuals who identified as sexual majority or sexual
47 minority within each ethnicity was not equal ($X^2(3) = 24.07, p<.000$) in the total sample,
48 with a particularly low number of Asian participants identifying as sexual minority (2.3% as
49 compared to 4.8-5.3%).
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2 Division of participants into smaller groups based on reported sexual orientation led to very
3 few participants in a given group, particularly concerning responses with low endorsement
4 rates. This number occasionally affected the use of X^2 statistical tests in this dataset. It
5 was decided that more information could consistently be obtained through combining the
6 sexual minority sample.
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12 Table 2 shows the number (percentage) of individuals who responded “yes” to the
13 respective question from the sexual majority and sexual minority cohorts.
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16 *(Table 3 here)*
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18 **Mental health**

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20 Sexual minority individuals (M=1.48, SD=1.09) had significantly higher scores in negative
21 mental health than sexual majority individuals (M=0.58, SD=0.79) [$t(6719)=-$
22 19.31, $p<0.001$]. Individual item analyses showed that as related to sexual majority
23 individuals, significantly less sexual minority individuals endorsed being happy (sexual
24 majority =94%, sexual minority =70.4%) [OR=0.15(95%C.I. = 0.12-0.20)], or hopeful
25 (sexual majority =85.9%, sexual minority =59%) [OR=0.24(95%C.I. = 0.19-0.30)].
26 Moreover, results indicated that sexual minority individuals, as compared to sexual
27 majority individuals, had 8.24 (95%C.I. = 6.56-10.37) higher odds of feeling lonely
28 frequently (sexual majority =14.1%, sexual minority =57.4) and 7.28 (95%C.I. =5.78-9.15)
29 higher odds of having harmed themselves (sexual majority =8.8%, sexual minority
30 =41.3%).
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41 The proportion of sexual minority individuals who reported having been affected by
42 violence or abuse in their family or relationships was almost three times higher than sexual
43 majority individuals (straight=6.3%, sexual minority =18.6%) [OR=3.37(95%C.I. =2.52-
44 4.50)]. Sexual minority individuals had significantly higher scores on the bullying composite
45 measure than sexual majority individuals ($p<.001$). Relative to sexual majority individuals,
46 an approximately three times higher proportion of sexual minority individuals reported
47 being bullied (sexual majority =9.2%, sexual minority =32.6%) [OR=4.76(95%C.I. = 3.74-
48 6.05)], cyber-bullied (straight=10.8%, sexual minority =29.3%) [OR=3.41(95%C.I. = 2.67-
49 4.35)], or being bullied in either of the two situations (sexual majority =16.4%, sexual
50 minority =45.8%) [OR=4.30(95%C.I. =3.44-5.36)].
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Physical health

Comparisons of composite variable scores (interaction with health professionals, total food intake and total overall physical health) showed that relative to sexual majority individuals, sexual minority individuals had significantly lower scores in all categories. This indicates that sexual minority individuals generally have less healthy responses to these items (all $p < 0.001$). For individual items, a lower proportion of sexual minority individuals than sexual majority individuals reported visiting the dentist (sexual majority =97.3%, sexual minority=94%) [OR=0.43(95%C.I. = 0.27-0.68)]. Furthermore, during their last visit with a healthcare professional, fewer sexual minority than sexual majority individuals reported feeling listened to (sexual majority =94%, sexual minority=87.2%) [OR=0.43(95%C.I. = 0.31-0.61)], feeling that they were given enough information (sexual majority =92.7%, sexual minority=83.9%) [OR=0.41(95%C.I. =0.30-0.55)], or feeling that they understood all of the information they were given (sexual majority =85.2%, sexual minority=75.5%) [OR=0.61(95%C.I. =0.50-0.74)].

Sexual minority individuals also reported a lower likelihood of having eaten three meals the day prior (sexual majority=79%, sexual minority=58.5%) [OR=0.37(95%C.I. = 0.30-0.47)] or fruits and vegetables the day prior (sexual majority=83.9%, non-straight=73.9%) [OR=0.73(95%C.I. = 0.56-0.96)]. Multinomial logistic regressions showed that the odds of a participant, given they identify as not being in a sexual majority compared to being in a sexual majority, saying they see themselves as underweight as compared to "just right" are 1.69 (95%C.I. = 1.18-2.42) higher (sexual majority=8.4%, sexual minority=10.8%). The odds of a sexual minority individual, as compared to a sexual majority individual, saying they are overweight as compared to "just right" are 2.4 times higher (95%C.I.=1.89-3.06)(sexual majority=17.6%, sexual minority=32.5%).

Discussion

Main finding of this study

This study found significant differences in the responses of sexual majority and sexual minority CYP across both mental and physical dimensions of health. In terms of mental and emotional health, sexual minority CYP were less likely than their sexual majority peers

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2 to describe themselves as happy or hopeful about their future and were more likely to
3 report feeling lonely. Sexual minority young people were more likely to report self-harming
4 and more likely to be bullied. They were also more likely to have experienced violence in
5 their family or personal relationships. Sexual minority CYP were significantly more likely
6 than sexual majority CYP to report having been bullied within the previous two months.
7 This included being more likely to have experienced cyber-bullying.
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14 In terms of physical health, sexual minority CYP were less likely to eat three meals a day
15 and were more likely to be concerned about their weight (both over and underweight).
16 Compounding these poorer reported outcomes for sexual minority CYP were significantly
17 poorer experiences of services than their sexual majority peers. Sexual minority CYP were
18 more likely to feel that they were not being listened to and that the information they were
19 given was insufficient and difficult to understand.
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26 **What is already known on this topic?**

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28 We reviewed published studies that compared health outcomes of sexual majority and
29 sexual minority CYP associated with psychological or mental health; and the health-related
30 behaviours associated with physical health; physical activity and diet, areas where there
31 has been less research.²⁵ As our sample population was aged 13-14 years, we only
32 included studies of populations aged 12-18 and where the average age of the study
33 population was no more than 15 years. To include findings from wider age groups was
34 considered less comparable.
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42 **Mental Health**

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44 Studies in the United States, Canada and Iceland analysing data from school surveys
45 found that CYP who self-identify as lesbian, gay or bisexual were significantly more likely
46 to report suicidal ideation and self-harm than their sexual majority peers.⁹⁻¹⁴ A study of
47 developmental mental health in the Netherlands found lesbian, gay and bisexual
48 adolescents were at higher risk of depressive symptoms compared to sexual majority
49 adolescents, with the disparity particularly marked, with lesbian and bisexual girls from age
50 11, compared to their sexual majority peers.¹⁶
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Physical Health

A United States (US) study exploring differences in physical activity levels between CYP aged 14-18 years found sexual minority CYP reported less physical activity than sexual majority CYP. This difference remained for boys, not girls, after adjusting for age, race/ethnicity, a marker of SES, victimisation and BMI.¹⁷

In relation to weight, the same study¹⁷ found differences in BMI and obesity between sexual minority and sexual majority CYP. After adjusting for potential confounders, sexual minority girls were more likely to be overweight and obese than sexual majority girls; this was not the case for boys.

Unhealthy diet-related behaviours were also different between sexual minority and sexual majority CYP. One US longitudinal study found sexual minority CYP had higher rates of disordered eating, such as fasting or purging to control weight, than sexual majority CYP.¹⁸ Incorrect self-perceptions about body weight were more likely in sexual minority than sexual majority CYP.¹⁹

What this study adds

Most published literature is from the United States, reflecting CYP health and well-being and behaviours which could be different to CYP in England. To our knowledge this is the first large-scale study in the United Kingdom, to investigate health-related behaviours, as most studies of minority CYP use convenience samples. This study is important in providing a large, representative sample of CYP in one region of the UK; a high percentage (67.8%) of all CYP in the area responded and less than 1% provided answers that suggested they were acquiescing rather than providing authentic answers. The respondents are representative of the gender and ethnicity of the sample population though the survey was not constructed to specifically reflect each ethnic group within the sample. Lancashire is a large county with a 2015 population of 1,192, 000, of whom 5.9% were from an ethnic minority. Around 19% of children live in low income families compared to 20% in England.²⁶ This increases the generalisability of our findings to other settings.

The survey content covers a broad range of mental and physical health indicators so the responses provide greater robustness than other studies which usually cover one or the

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2 other, not both. Further robustness can be attributed to this study since 4% of respondents
3 identified as being in a sexual minority which is consistent with recent PHE estimates of
4 the total population percentage who are in a sexual minority.²⁷
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9 This study highlights the importance of asking questions about sexual orientation in health-
10 related questionnaires and how it can inform policymaking. NHS England introduced the
11 Sexual Orientation Monitoring Information Standard this year²⁸ which will allow
12 policymakers and commissioners to better identify those whose health risk is increased
13 due to their sexual minority status. This will help target preventative and early intervention
14 strategies. There is a policy vacuum with services for this group and this study
15 demonstrates the importance of explicitly including CYP who are in a sexual minority in
16 national and local strategies, for example suicide prevention. There is also inconsistency in
17 mainstream policy and practice guidelines in the approach to including the needs of sexual
18 minority CYP and in the recognition of the degree to which sexual minority CYP may be
19 vulnerable or at increased risk. Results from this study warrant attention and action by
20 those who plan and deliver health and education services. The findings and insights also
21 provide opportunities to better inform training and guidance for those working with CYP.
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33 This study indicates areas for future research. Greater understanding of the causal
34 pathways and mechanisms is needed so risk factors can be mitigated, protective factors
35 explored, and effective interventions developed to support CYP within a societal
36 environment more respectful of differing sexual orientation. Taken collectively these
37 findings reflect a significant mental, emotional and physical health burden on sexual
38 minority CYP that needs to be addressed by targeted public health policies that promote
39 and protect CYP health rights within and outside the school setting.
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47 **Limitations of this study**

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49 We were unable to control the conditions for survey completion. Some schools are more
50 supportive of the survey than others. The data is self-reported and despite explanation
51 provided to respondents, CYP are likely to have different levels of understanding and
52 some degree of social desirability bias. Participation is based on ability to consent, not
53 health literacy, so this may lead to variability in how questions are answered.
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4 All data is quantitative and predominately binary variables, due to the constraints of
5 collecting data in an existing health needs assessment in schools. This affects the extent
6 to which we can conduct complex statistical analyses and control for confounding
7 variables. Psychometric data for the summed items were not obtained due to the
8 aforementioned nature of the questions. The nature of the summed scales (which are
9 mostly binary, tied to broader health domains, and consist of between 2-4 questions) does
10 not lend itself to this type of psychometric analysis.
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18 The primary purpose of the survey tool resulted in the collapsing of suicidal and non-
19 suicidal self-harm domains within the same question, as the initial follow up action is
20 similar. A qualitative component would enable exploration of the response nuances and
21 the lived experiences of CYP.
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27 Sexual orientation was based on reported sexual identity, not qualified by additional
28 questions about attraction or behaviour. This could have resulted in misclassification and
29 underestimation of the sexual minority population due to factors such as fluidity and fear of
30 disclosure.²⁹
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36 **Conclusion**

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38 The data collected through a routine school health needs assessment has enabled its
39 opportunistic analysis in relation to risk factors for children in a sexual minority group. The
40 findings are consistent with previous studies showing poor mental health for this group of
41 children, and indicate they experience poor physical health too. The significance of the
42 findings indicates that further research is required to explore how policy and services
43 should be designed and delivered for this group of children.
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49 **Acknowledgments**

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52 routinely collect this data; Ms J Johnson, Mrs J Burrows, Ms H Barford and the SHNA
53 Operational Group for their input to the framework that enabled the data collection; Ms C
54 Harris for conducting the literature searches.
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Table 1
Demographic characteristics and cross-tabulated frequencies by sexual orientation

Variable	Response	N	%
Sex ^a	Male	4009	50.5
	Female	3901	49.2
	Other	24	0.3
	Missing	92	1.1
Sexuality ^a	Straight	7440	92.7
	Gay/Lesbian	50	0.6
	Bi-sexual	192	2.4
	Other	112	1.4
	All sexual minority	354	4.4
	Missing	232	2.9
Ethnicity ^a	White	5805	72.3
	Mixed	261	3.3
	Asian or Asian British	1805	22.5
	Black or Black British	60	0.7
	Missing	95	1.2
	Gender identification ^a	Identify with gender at birth	5515
Do not identify with gender at birth		101	1.3
Missing		2410	30
Sex by Sexuality	Male by sexual minority ^b	109	2.8
	Female by sexual minority ^c	221	5.9
Ethnicity by Sexuality	White by sexual minority ^d	290	5.1
	Mixed by sexual minority ^e	12	4.8
	Asian or Asian British by sexual minority ^f	40	2.3
	Black or Black British by sexual minority ^g	3	5.3
Gender identification by Sexuality	No by sexual minority ^h	40	15.5
	No by sexual majority ⁱ	53	1

^aTotal N=8026; ^bn=3912; ^cn=3777; ^dn=5688; ^en=250; ^fn=1724; ^gn=57; ^hn=258; ⁱn=5256

Table 2Odds ratios (OR) and comparisons (X^2 tests) between sexual majority and sexual minority individuals

Item (Item number)	Most positive response	N (Total)	Sexual Majority	Sexual Minority	Test Statistic					
			Yes (%)	Yes (%)	X^2	df ^a	P-value	OR ^b	LL ^c	UL ^d
The last time you went to see a health professional, were you given enough information? (1)	Yes	7534	6670 (83.9)	287 (92.7)	35.94	1	0	0.41	0.30	0.55
The last time you went to see a health professional, did you understand everything you were told? (2)	Yes	7533	6128 (85.2)	256 (75.5)	23.40	1	0	0.61	0.50	0.74
The last time you went to see a health professional, did you feel you were listened to? (3)	Yes	7472	6709 (94)	293 (87.2)	25.28	1	0	0.43	0.31	0.61
Do you go to the dentist? (4)	Yes	7739	7192 (97.3)	328 (94)	13.50	1	0	0.43	0.27	0.68
Yesterday, did you eat something for breakfast, dinner and tea? (5)	Yes	7722	5824 (79)	204 (58.5)	82.08	1	0	0.37	0.30	0.47
Did you eat any fruit or vegetables yesterday? (6)	Yes	7678	6150 (83.9)	275 (79.3)	5.22	1	0.02	0.73	0.56	0.96
How often do you drink sugary soft drinks? (Once a week) (7)	Never or not often	7639	3558 (48.7)	153 (45)	2.60	3	0.46	0.81	0.61	1.08
How often do you drink sugary soft drinks? (Every day) (7)	Never or not often	-	1899 (26)	89 (26.2)	-	-	-	0.89	0.65	1.21
How often do you drink sugary soft drinks? (More than once a day) (7)	Never or not often	-	424 (5.8)	23 (6.8)	-	-	-	1.03	0.64	1.66
On a weekday how many hours do you usually spend sitting or lying down watching TV, DVDs, computer games? (1-2 hours) (8)	Less than 1 hour	7668	2412 (32.9)	83 (24.1)	33.33	3	0	0.86	0.56	1.33
On a weekday how many hours do you usually spend sitting or lying down watching TV, DVDs, computer games? (2-3 hours) (8)	Less than 1 hour	-	1922 (26.2)	76 (22)	-	-	-	0.99	0.64	1.53
On a weekday how many hours do you usually spend sitting or lying down watching TV, DVDs, computer games? (More than 3 hours) (8)	Less than 1 hour	-	2262 (30.9)	157 (45.5)	-	-	-	1.74	1.16	2.06
About your weight, do you think you are just right, underweight or overweight? (underweight) (9)	Just right	7545	603 (8.4)	37 (10.8)	54.93	2	0	1.69	1.18	2.42
About your weight, do you think you are just right,	Just right	-	1269 (17.6)	111 (32.5)	-	-	-	2.40	1.89	3.06

underweight or overweight? (overweight) (9)

1	About your feelings, do you often feel happy? (10)	Yes	7423	6665 (94)	233 (70.4)	267.68	1	0	0.15	0.12	0.20
2	About your feelings, do you often feel hopeful about	Yes	7082	5798 (85.9)	194 (59)	174.21	1	0	0.24	0.19	0.30
3	your future? (11)										
4	About your feelings, do you often feel angry? (12)	No	7010	2457 (36.8)	171 (51.4)	28.67	1	0	1.81	1.45	2.26
5	About your feelings, do you often feel lonely? (13)	No	7002	939 (14.1)	189 (57.4)	436.49	1	0	8.24	6.56	10.37
6	Have you ever hurt or harmed yourself deliberately? (14)	No	7552	635 (8.8)	142 (41.3)	375.02	1	0	7.28	5.78	9.15
7	Have you been bullied more than once in the last two	No	7615	670 (9.2)	111 (32.6)	192.79	1	0	4.76	3.74	6.05
8	months? (15)										
9	Have you been cyber-bullied (someone sending mean	No	7583	784 (10.8)	101 (29.3)	108.66	1	0	3.41	2.67	4.35
10	instant messages, wall-postings, emails and text										
11	messages)? (16)										
12	Have you taken part in bullying someone else during the	No	7587	221 (3.1)	26 (7.6)	21.49	1	0	2.62	1.72	3.99
13	last two months? (17)										
14	Do you know where to get help about bullying? (18)	Yes	7593	6795 (93.7)	305 (88.7)	13.93	1	0	0.52	0.37	0.74
15	The intersection of (15) and (16)	No	7547	1183 (16.4)	157 (45.8)	193.16	1	0	4.30	3.44	5.36
16	Have you ever been affected by domestic	No	7542	457 (6.3)	63 (18.6)	75.56	1	0	3.37	2.52	4.50
17	abuse/violence (including physical or emotional abuse)										
18	in your family or other relationships? (19)										
19	Do you have an adult you can talk to about any	Yes	7556	6771 (93.9)	283 (82.7)	65.00	1	0	0.31	0.23	0.42
20	problems? (20)										

^a Degrees of freedom; ^b Odds ratio; ^c Upper limit (95% confidence interval); ^d Lower limit (95% confidence interval)

Table 3

T-tests and Mann-Whitney tests for comparisons of means

Variable name	Composite	N	Sexual Majority	Sexual Minority	Test statistic	Mean difference (SE) ^c	LL ^d	UL ^e
Food intake	Sum of items 5-7 ^b	7519	3.57(0.65) ^a	3.32(0.76) ^a	t(7517)=7.05, p<.001	0.26(0.04)	0.19	0.33
Overall physical health	Sum of items 5-9 ^b	7711	6.46(1.43) ^a	5.74(1.60) ^a	t(7709)=9.20, p<.001	0.72(0.08)	0.57	0.88
Negative psychological health	Sum of items 12-14	6721	0.58(0.79) ^a	1.48(1.09) ^a	t(6719)=-19.31, p<.001	-0.89(0.05)	-0.99	-0.80
Interaction with health professionals	Sum of items 1-4	7508	3781.39 ^b	3187.52 ^b	Mann-Whitney U=1025785.50, p<.001	-	-	-
Positive psychological health	Sum of items 10 & 11	6915	3517.04 ^b	2245.14 ^b	Mann-Whitney U=669010.50, p<.001	-	-	-
Sum of bullied	Sum of items 15 & 16	7525	3711.99 ^b	4840.96 ^b	Mann-Whitney U=854942, p<.001	-	-	-

^a Mean (SD); ^b Mean ranks; ^c Standard error; ^d Upper limit (95% confidence interval); ^e Lower limit (95% confidence interval)

^b Items 7 through 9 were recoded dichotomously and reversed for summing, with 1 indicating only the most adaptive response and 0 indicating any responses higher than this

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6 **Major risk factors for sexual minority young people's mental and physical health:**
7 **findings from a county-wide school-based health needs assessment**
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Abstract

Background Childhood health is an important adult health predictor. Sexual orientation is increasingly recognised as influential on children and young people's (CYP) mental and physical health. ~~CYP in a sexual minority may have poorer mental and physical health than children in a majority sexual orientation group.~~

Methods Data came from a cross-sectional survey of year 9 children attending schools in two local authorities in the north-west of England, including mental and physical health indicators, and demographic characteristics including sexual orientation. The sample of 8,058 represented 67.8% of the eligible population. Data were analysed by sexual orientation; ~~sexual majority or sexual minority~~ straight or non-straight.

Results Children reporting their sexual orientation as ~~sexual minority~~ non-straight reported worse mental and physical health outcomes and behaviours than ~~sexual majority~~ straight peers; had higher odds of being lonely (OR 8.24, 95% C.I. = 6.56-10.37), having self-harmed (OR 7.28, 95% C.I. = 5.78-9.15), being bullied (OR 4.76, 95% C.I. = 3.74-6.05) or perceiving themselves as overweight (OR 2.40, 95% C.I. = 1.89-3.06).

Conclusions It is important to identify and support children in a sexual minority. Research is required to understand differences between children within sexual minorities and the impact on outcomes and rights. Health and social policy and services, should respond to ~~the~~ vulnerabilities of sexual minority ~~CYP children and young people~~.

Background

Childhood and adolescent health are important predictors of adult health and are seen as key policy drivers in the United Kingdom and internationally.^{1,2,3,4} Addressing poor mental and physical health outcomes are a “valuable investment for the health of the population”.²

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The impact of a range of socio-economic factors on childhood and adolescent health outcomes is well researched and there is an emerging international evidence base for the importance of sexual orientation as a key factor contributing to the children and young people’s (CYP) mental and physical health.^{5,6,7} CYP whose sexual orientation puts them in a minority group have been found to be more likely to have poor mental and physical health outcomes than other CYP.^{8,9,10,11,12,13,14,15,16, 47,18,19,20,21} International studies have shown that sexual minority CYP have higher rates of suicide ideation, self-harm and depression.^{7-10,17} In terms of physical health, studies conducted in the US have shown lower levels of physical activity in sexual minority boys and higher levels of obesity in sexual minority girls suggesting an intersection with gender that requires additional exploration.^{15,17}

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Explanations for the drivers of the differences are currently tentative. They are generally seen to relate to the prevalence of homophobic and transphobic attitudes, at individual and social levels, that make membership of a sexual minority unsafe and vulnerable in a range of public social spaces.²² School environments in particular have been found to regulate sexuality and gender norms and treat transgressions from these norms as problematic.²³ The impact of bullying, discrimination and a lack of affirmation constitute particular risks to mental health and well-being and can impede participation in physical activities.^{24,25}

The data source for this study is a routine school health needs assessment in two local authorities in the north-west of England. This is a relatively unique dataset as it is not a requirement for schools or health services in the UK to conduct a health needs assessment in schools. This survey has been conducted in approximately 500 schools for six years. Questions relating to sexual orientation were added in September 2016. In 2016, nearly 70% of all year 9 (13-14 years of age) pupils enrolled in schools across the local authorities participated in the survey. This constitutes a large and representative

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sample which adds to the limited evidence base in the UK and internationally. The data is collected to inform service provision across localities and within individual schools and clinical care to individual pupils. This accounts for the challenges we faced when analysing the data. We have maximised the potential of this data, recognising that data collected specifically for research purposes would allow more flexibility and rigour in the analysis. This paper draws on a well-established school health needs assessment carried out annually in two Local Authorities in the north west of England. Whilst the survey has been conducted since 2011 questions relating to sexual orientation were only added in September 2016. In 2016, nearly 70% of all year 9 (13-14yrs) pupils enrolled in schools across the Local Authorities took part in the survey. This constitutes a large and representative sample on which to base for this paper which seeks to add to the limited evidence base in the UK and internationally.

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Throughout the paper the phrase 'sexual minority' is used to describe all young people who described themselves as lesbian, gay, bisexual or transgender. We recognise that this obscures the differences within this group of CYP. However this paper is seeking to understand the mental and physical health implications of minority sexuality among this large, school based sample. We are currently exploring the differences within the sexual minority group of young people.

The data source for this study is a routine school health needs assessment. This is a relatively unique dataset as it is not a requirement for schools or health services in the UK to conduct a health needs assessment. This survey has been conducted in approximately 500 schools for six years. The data is collected to inform service provision across localities and within individual schools and clinical care to individual pupils. This accounts for the challenges we faced when trying to analyse the data. We have maximised the potential of this data, recognising that data collected specifically for research purposes would allow more flexibility and rigour in the analysis.

Childhood health is an important predictor for adult health. "The foundations for virtually every aspect of human development—physical, intellectual and emotional—are laid in early childhood."²⁶ The Chief Medical Officer's 2007 report recognised the societal and policy importance of this when he said "The effects of poor health in adolescence can last a lifetime, or even shorten it. Keeping adolescents well and supporting their health

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6 resilience is a valuable investment for the health of the population in the future.²⁷ This is
7 reflected in national and international policy and strategies.^{28,29}

8
9 Sexual orientation has emerged as a key factor influencing a child's mental and physical
10 health, their daily life experiences and attitudes of others towards them.³⁰ The impact of
11 sexual orientation may be positive or negative, but children and young people (CYP)
12 experiencing difficulties related to their sexual orientation may benefit from support.
13 Children whose sexual orientation puts them in a minority group may have poorer mental
14 and physical health than children in a majority sexual orientation group^{9,24}. They may face
15 barriers to attaining their rights to optimal development and protection from harm.³¹ In this
16 study we classified children who were not in the sexuality majority as non-straight. This
17 was to preserve statistical power and because we sought to understand differences
18 between CYP who classified themselves in the non-straight minority, compared to the
19 straight majority.

20
21 Recognising non-straight CYP have a greater risk of suicide and self-harm compared to
22 straight CYP, Public Health England and the Royal College of Nursing published a suicide
23 prevention toolkit for nurses working with young lesbian, gay and bisexual people (LGB).³²
24 LGB people have also been identified in the National Suicide Prevention Strategy as more
25 exposed to risks of suicide; the strategy calls for tailored approaches to improving their
26 mental health.³³

27
28 An established school health needs assessment survey carried out annually in a large
29 English county, sought to identify needs, promote child rights, and reduce inequities in
30 health and well-being. Originally this did not collect information about sexual orientation.
31 Following review it recognised this as an important omission. Questions about sexual
32 orientation were added to the survey in September 2016 providing a combined data set
33 unique in the context of United Kingdom school health.

41 42 **Methods**

43
44 We used data from a cross-sectional survey conducted between September 2016 and
45 June 2017 among year 9 children (13-14 years of age) attending secondary schools in two
46 local authorities in north-west England. The survey forms one component of an annual
47 participatory school health needs assessment (SHNA) of primary and secondary schools
48 undertaken by government health services for school age CYP. All primary and secondary
49 schools served by community-based health services of Lancashire Care NHS Foundation
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Trust were asked to engage pupils in the survey. ~~The sampling frame for this data was all year 9 pupils.~~

The survey tool collected named data about personal characteristics (ethnicity, sexual and gender identity). We took a ~~pragmaticpractical~~ approach to defining the categories, using vocabulary thought to be most likely understood by this age group in this region, ~~withand~~ thirty predominately binary questions (49 items), about access and experience of health care, healthy behaviours and risk-taking, emotional and mental health, carer responsibilities, exposure to violence and bullying, sexual and reproductive health, and self-protection. The survey was constructed using validated questions from existing domestic and international tools. Local development and field-testing of questions was undertaken where appropriate equivalents could not be ~~found~~sourced. Questions have been annually reviewed and refined in a multi-stakeholder process over ~~six~~five years.

~~The survey's sampling frame was all year 9 pupils attending mainstream schools in the area served by Lancashire Care NHS Foundation Trust.~~ When surveying CYP below 16 years it is usual to seek parental consent for participation. However it was successfully argued, based on Articles of the UN Convention on the Rights of the Child (UN 1989), that the majority of 13-14 year olds would be competent to make the decision to participate or not by themselves, once furnished with appropriate information.³⁴ Once their position as primary consenters was established, it would be wrong to approach someone else for their consent. Therefore year 9 pupils alone determined their participation with the exception of a few pupils with unclear self-consent competence. They had either further explanation to assist them attain competence, ~~or where.~~Where this was not possible, parents or carers were approached for consent.

To prepare pupils for making an informed choice, in the preceding week the school nurse gave pupils explanatory information verbally in a special assembly and in an appropriately written information sheet. This contained frequently asked questions about the survey's purpose, what happened with the information and how it was protected. Participation was encouraged but voluntary. CYP were assured there was no penalty for non-participation. CYP were assured individual findings would not be shared with the school without their permission and would be held in their confidential health service records; collated anonymised data would be shared with schools and health planners.

In total 8,026 year 9 pupils participated (3,901 girls; 4,009 boys; 24 who reported themselves as 'Other' in relation to gender), representing 67.8% of all year 9 pupils on

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6 school rolls. [The identification with the gender category “other” had no impact on analyses, as groups for analyses were determined based on sexual orientation responses only.](#)

7
8 Completed surveys were returned to the school nurse ~~s-offices~~. ~~Here~~ they were triaged to identify individual pupils requiring ~~further~~ follow-up. Next, anonymised data was entered into a web-based electronic database, collated in Excel, and then exported to SPSS ~~for further analysis~~.

9
10 Data were analysed using SPSS Statistics 22 and 24 ([SPSS, Inc., Chicago, IL, USA](#)).

11
12 Tests were conducted to identify potential acquiescence bias. Response rates for individual items and demographic characteristics were assessed. Demographic variables were compared using cross-tabulations. Variables assessing summed counts in related item categories were created. Bullying was assessed together with mental health. After testing of assumptions, comparisons of data and odds ratios (OR) were calculated using Chi-squared analyses, multinomial logistic regressions, t-tests, and Mann-Whitney tests.

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25 [Analyses comparing responses to multiple incompatible items \(such as behaviours indicative of healthy habits and behaviours indicative of less healthy habits\) showed that less than 1% provided answers that suggested they were acquiescing rather than providing authentic answers.](#)

26 27 28 29 30 31 **Results**

32
33 ~~Table 1 shows the items included in the results and the optimum response that could be provided for the question.~~

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36 Demographic characteristics (ethnicity, sex, ~~sexual and gender identity & sexuality~~) and cross-tabulations by sexual ~~orientationity~~ can be found in Table ~~12~~. The number of individuals who did not respond to the sexual ~~orientationity~~ item (n=232, 3%) defined the maximum number for subsequent analyses as 7,794 (instead of the 8,026 in the total sample). Ultimately, 7440 (95%) ~~sexual majoritystraight~~ individuals' responses and 354 (5%) ~~sexual minoritynon-straight~~ individuals' responses were used in analyses.

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45 *(Table 1 here)*

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47 Items were analysed individually, ~~shown in Table 2~~, and as composite measures (for indicators of mental and physical health) in order to further understand the associations between health outcomes and sexual orientation, shown in ~~Table 3~~.

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51 *(Table 2 here)*

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Significant differences were found between the number of males and females who identified as ~~sexual majority or sexual minority~~~~straight or non-straight~~ ($X^2(1) = 43.9546$, $p < .000$), with more females identifying as ~~sexual minority~~~~non-straight~~. The number of ~~sexual minority or sexual majority~~~~non-straight or straight~~ individuals who identified with their gender at birth was also significantly different ($X^2(1) = 311.6435$, Fisher's exact test = .000), with more ~~sexual majority~~~~straight~~ individuals identifying with their gender at birth. Finally, the number of individuals who identified as ~~sexual majority or sexual minority~~~~straight or non-straight~~ within each ethnicity was not equal ($X^2(3) = 24.07$, $p < .000$) in the total sample, with a particularly low number of Asian participants identifying as ~~sexual minority~~~~non-straight~~ (2.3% as compared to 4.8-5.3%).

Division of participants into smaller groups based on reported sexual orientation led to very few participants in a given group, particularly concerning responses with low endorsement rates, and this number occasionally affected the use of X^2 statistical tests in this dataset. It was decided that more information could consistently be obtained through combining the ~~sexual minority~~~~non-heterosexual~~ sample.

Table 23 shows the number (percentage) of individuals who responded "yes" to the respective question from the ~~sexual majority~~~~straight~~ and ~~sexual minority~~~~non-straight~~ cohorts, ~~respectively~~.

(Table 3 here)

Mental health

~~Non-straight~~~~Sexual minority~~ individuals had significantly lower scores in positive mental health than ~~straight~~~~sexual majority~~ individuals. ~~Sexual minority~~ ~~Non-straight~~ individuals ($M = 1.48$, $SD = 1.09$) had significantly higher scores in negative mental health than ~~sexual majority~~~~straight~~ individuals ($M = 0.58$, $SD = 0.79$) [$t(6719) = -19.31$, $p < 0.001$]. Individual item analyses showed that as related to ~~sexual majority~~~~straight~~ individuals, significantly less ~~sexual minority~~ ~~non-straight~~ individuals endorsed being happy (~~sexual majority~~ ~~straight~~ = 94%, ~~sexual minority~~ ~~non-straight~~ = 70.4%) [$OR = 0.15$ (95% C.I. = 0.12-0.20)], or hopeful (~~sexual majority~~ ~~straight~~ = 85.9%, ~~sexual minority~~ ~~non-straight~~ = 59%) [$OR = 0.24$ (95% C.I. = 0.19-0.30)]. Moreover, results indicated that ~~sexual minority~~ ~~non-straight~~ individuals, as compared to ~~sexual majority~~~~straight~~ individuals, had 8.24 (95% C.I. = 6.56-10.37) higher odds of feeling lonely frequently (~~sexual majority~~ ~~straight~~ = 14.1%, ~~sexual minority~~ ~~non-straight~~ = 57.4) and 7.28 (95% C.I. = 5.78-9.15) higher odds of having harmed themselves (~~sexual majority~~ ~~straight~~ = 8.8%, ~~sexual minority~~ ~~non-straight~~ = 41.3%).

The proportion of non-straightsexual minority individuals who reported having been affected by violence or abuse in their family or relationships was almost three times higher than straightsexual majority individuals (straight=6.3%, sexual minority non-straight=18.6%) [OR=3.37(95% C.I. =2.52-4.50)]. Sexual minority Non-straight individuals had significantly higher scores on the bullying composite measure than straightsexual majority individuals ($p<.001$). Relative to sexual majority straight individuals, an approximately three times higher proportion of sexual minority non-straight individuals reported being bullied (sexual majority straight=9.2%, sexual minority non-straight=32.6%) [OR=4.76(95% C.I. = 3.74-6.05)], cyber-bullied (straight=10.8%, sexual minority non-straight=29.3%) [OR=3.41(95% C.I. = 2.67-4.35)], or being bullied in either of the two situations (sexual majority straight=16.4%, sexual minority non-straight=45.8%) [OR=4.30(95% C.I. =3.44-5.36)].

(Table 4 here)

Physical health

Comparisons of composite variable scores (interaction with health professionals, total food intake and total overall physical health) showed that relative to sexual majoritystraight individuals, non-straightsexual minority individuals had significantly lower scores in all categories. This indicates that non-straightsexual minority individuals generally have less healthy responses to these items (all $p<0.001$). For individual items, a lower proportion of non-straightsexual minority individuals than sexual majoritystraight individuals reported visiting the dentist (sexual majority straight=97.3%, non-straightsexual minority=94%) [OR=0.43(95% C.I. = 0.27-0.68)]. Furthermore, during their last visit with a healthcare professional, fewer sexual minoritynon-straight than sexual majoritystraight individuals reported feeling listened to (sexual majority straight=94%, non-straightsexual minority=87.2%) [OR=0.43(95% C.I. = 0.31-0.61)], feeling that they were given enough information (sexual majority straight=92.7%, non-straightsexual minority=83.9%) [OR=0.41(95% C.I. =0.30-0.55)], or feeling that they understood all of the information they were given (sexual majority straight=85.2%, non-straightsexual minority=75.5%) [OR=0.61(95% C.I. =0.50-0.74)].

Non-straightSexual minority individuals also reported a lower likelihood of having eaten three meals the day prior (straightsexual majority=79%, non-straightsexual minority=58.5%) [OR=0.37(95% C.I. = 0.30-0.47)] or fruits and vegetables the day prior

(~~sexual majoritystraight~~=83.9%, non-straight=73.9%) [OR=0.73(95%C.I. = 0.56-0.96)].

Multinomial logistic regressions showed that the odds of a participant, given they identify as not being ~~in a sexual majoritystraight~~ compared to being ~~in a sexual majoritystraight~~, saying they see themselves as underweight as compared to "just right" are 1.69 (95%C.I. = 1.18-2.42) higher (~~sexual majoritystraight~~=8.4%, ~~sexual minoritynon-straight~~=10.8%).

The odds of ~~a sexual minoritynon-straight~~ individual, as compared to ~~a sexual majoritystraight~~ individuals, saying they are overweight as compared to "just right" are 2.4 times higher (95%C.I.=1.89-3.06)(~~sexual majoritystraight~~=17.6%, ~~sexual minoritynon-straight~~=32.5%). ~~These multinomial logistic regressions also confirmed that the odds of a non-straight individual, as compared to a sexual majoritystraight individual, spending more than three hours in front of screens, as compared to "less than one hour", are 1.74 times higher. The odds of a non-straightsexual minority individual, as compared to a sexual majoritystraight individual, drinking soft drinks once a week or more frequently, as compared to "never or not often", range from 0.81 to 1.03 times higher.~~

Discussion

Main finding of this study

This study found significant differences in the responses of ~~sexual majority -straight~~ and ~~sexual minority non-straight~~ CYP across both mental and physical dimensions of health. In terms of mental and emotional health, ~~sexual minority non-straight~~ CYP were less likely than their ~~sexual majoritystraight~~ peers to describe themselves as happy or hopeful about their future and were more likely to report feeling lonely. ~~Sexual minority Non-straight~~ young people were more likely to report self-harming and more likely to be bullied. They were also more likely to have experienced violence in their family or personal relationships. ~~Sexual minority Non-straight~~ CYP were significantly more likely than ~~sexual majority straight~~ CYP to report having been bullied within the previous two months. This included being more likely to have experienced cyber-bullying.

In terms of physical health, ~~sexual minority non-straight~~ CYP were less likely to eat three meals a day and were more likely to be concerned about their weight (both over and underweight). Compounding these poorer reported outcomes for ~~sexual minority non-straight~~ CYP were significantly poorer experiences of services than their ~~sexual majoritystraight~~ peers. ~~Sexual minority Non-straight~~ CYP were more likely to feel that they were not being listened to and that the information they were given was insufficient and difficult to understand.

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What is already known on this topic?

We reviewed published studies that compared health outcomes of ~~straight sexual majority~~ and ~~sexual minority non-straight~~ CYP associated with psychological or mental health; and the health-related behaviours associated with physical health; physical activity and diet, ~~areas where there has been less research.~~³⁵ As our sample population was aged 13-14 years, we only included studies of populations aged 12-18 and where the average age of the study population was no more than 15 years. To include findings from wider age groups was considered less comparable.

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Mental Health

Studies in the United States, Canada and Iceland analysing data from school surveys found that CYP who self-identify as lesbian, gay or bisexual ~~we~~ are significantly more likely to report suicidal ideation and self-harm than their ~~sexual majority heterosexual~~ peers^{8,9,10,11,12,13,36,37,38,39}. ~~Some studies found the risk of suicidal ideation is particularly high with CYP who self-identify as bisexual compared to their heterosexual counterparts.~~^{12,13,40,41} A study of developmental mental health in the Netherlands found lesbian, gay and bisexual adolescents were at higher risk of depressive symptoms compared to ~~sexual majority heterosexual~~ adolescents, with the disparity particularly marked, with lesbian and bisexual girls from age 11, compared to their ~~sexual majority heterosexual~~ peers.^{14,42}

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Physical Health

A United States (US) study exploring ~~ing~~ differences in physical activity levels between CYP aged 14-18 years ~~and~~ found ~~sexual minority non-straight~~ CYP reported less physical activity than ~~sexual majority straight~~ CYP. This difference remained for boys, not girls, after adjusting for age, race/ethnicity, a marker of SES, victimisation and BMI.^{15,43} ~~Another study investigated participation in sports activities and found no difference in participation rates between non-straight sexual minority and straight sexual majority CYP, although there were differences when analysed by grade level; non-straight sexual minority boys were less likely to participate in soccer and wrestling (2 of 11 sports included) at higher grade levels than straight sexual majority boys, and non-straight sexual minority girls were more likely to play sports (3 out of 11) in later adolescence than straight girls sexual majority.~~^{16,44}

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In relation to weight, ~~the same a US study that of CYP aged 14-18~~ found differences in BMI and obesity between ~~non-straight sexual minority~~ and ~~straight sexual majority~~ CYP. After adjusting for potential confounders, ~~non-straight sexual minority~~ girls were more likely to be

overweight and obese than ~~straight sexual majority~~ girls; ~~though~~ this was not the case for boys.¹⁷⁴⁵

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Unhealthy diet-related behaviours were also different between ~~non-straight~~sexual minority and ~~straight sexual majority~~ CYP. One US longitudinal study found ~~that~~ sexual minority ~~non-straight~~ CYP had higher rates of disordered eating, such as fasting or purging to control weight, than ~~straight sexual majority~~ CYP.¹⁸⁴⁶ Incorrect self-perceptions about body weight were more likely in ~~sexual minority non-straight~~ than ~~straight sexual majority~~ CYP.¹⁹⁴⁷

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What this study adds

Most published literature is from the United States, reflecting CYP health and well-being and behaviours which could be different to CYP in England. To our knowledge this is the first large-scale study ~~based on a representative sample of non-straightsexual minority and straight seexual majority CYP~~ in the United Kingdom, to investigate health-related behaviours, as most studies of minority CYP use convenience samples. This study is important in providing a large, representative sample of CYP in one ~~region~~area of the UK; a high percentage (67.8%) of all CYP in the area responded and less than 1% provided answers that suggested they were acquiescing rather than providing authentic answers.

The respondents are representative of the gender and ethnicity of the sample population. ~~This survey was conducted in schools within two local authorities in the north-west of England which may limit generalisability to other regions. The sample represents a high proportion of the target population, though but the survey was not constructed to specifically reflect each ethnic group within the sample. However, Lancashire is a large county with a 2015 population of 1,192,000, of whom 5.9% were from an ethnic minority. Life expectancy for men and women is lower than the England average but is 10.1 years lower for men and 7.8 years lower for women in the most deprived areas of Lancashire than the least deprived areas. Around 19% of children live in low income families compared to 20% in England, with disparities between areas reflecting social inequity within the county.~~⁴⁸²³ This increases the generalisability of our findings to other settings.

The survey content covers a broad range of mental and physical health indicators so the responses provide greater robustness than other studies ~~since data about mental health can be compared with physical health in the same sample which usually cover one or the other, not both~~. Further robustness can be attributed to this study since 4% of respondents identified as ~~being in a non-straight~~sexual minority which is consistent with

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6 recent PHE estimates of the total population percentage who are ~~non-straight in a sexual~~
7 minority.²²

9 This study highlights the importance of asking questions about sexual orientation in health-
10 related questionnaires and how it can inform policymaking. NHS England introduced the
11 Sexual Orientation Monitoring Information Standard this year (2018) which will allow
12 policymakers and commissioners to better identify those whose health ~~is at risk~~ is
13 increased due to their sexual minority status; ~~and This will~~ help target preventative and
14 early intervention strategies. There is a policy vacuum with services for this group and this
15 study demonstrates the importance of explicitly including CYP who are ~~non-straight in a~~
16 sexual minority in national and local strategies, for example suicide prevention. There is
17 also inconsistency in mainstream policy and practice guidelines in their approach to
18 including the needs of ~~non-straightsexual minority~~ CYP and in their recognition of the
19 degree to which ~~non-straightsexual minority~~ CYP may be vulnerable or at increased risk.
20 Results from this study warrant attention and action by those who plan and deliver health
21 and education services. The findings and insights also provide opportunities to better
22 inform training and guidance for those working with CYP.
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29 This study indicates areas for future research. Greater understanding of the causal
30 pathways and mechanisms ~~at play~~ is needed so risk factors can be mitigated, protective
31 factors explored, and effective interventions developed ~~that to~~ support CYP within a
32 societal environment more respectful of differing sexual orientation.²⁷ Taken collectively
33 these findings reflect a significant mental, emotional and physical health burden on ~~non-~~
34 straightsexual minority CYP that needs to be addressed by targeted public health policies
35 that promote and protect CYP health rights within and outside the school setting.
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39 **Limitations of this study**

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41 We were unable to ~~fully~~ control the conditions for survey completion. Some schools are
42 more supportivefacilitative of the surveyexercise than others. The data is self-reported and
43 despite ~~reassurance and~~ explanation provided to respondents, CYP are likely to have
44 different levels of understanding and some degree of social desirability bias. Participation
45 is based on ability to consent, not health literacy, so ~~despite participation of CYP in the~~
46 survey's development, this may lead to variability in how questions are answered.
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49 All data is quantitative and predominately binary variables, due to the constraints of
50 collecting data in an existing health needs assessment in schools. This affects the extent
51 to which we can conduct complex statistical analyses and control for confounding
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~~variables. All data is quantitative and predominately limited to binary variables due to the constraints of collecting data via an existing health needs assessment in schools; also limiting more complex statistical analyses to control for confounding variables, and a~~
Psychometric data for the summed items were not obtained due to the aforementioned nature of the questions. The nature of the summed scales (which are mostly binary, tied to broader health domains, and consist of between 2-4 questions) does not lend itself to this type of psychometric analysis.

The primary purpose of the survey tool resulted in the collapsing of suicidal and non-suicidal self-harm domains within the same question, as the initial follow up action is similar. A qualitative component would ~~have~~ enabled us to explore ~~atione of the response~~ nuances of responses and the lived experiences of CYP ~~in more depth.~~

~~This survey was conducted in schools within two local authorities in the north-west of England which may limit generalisability to other regions. The sample represents a high proportion of the target population, but was not constructed to specifically reflect each ethnic group within the sample. However, Lancashire is a large county with a 2015 population of 1,102, 000, of whom 5.0% were from an ethnic minority. Life expectancy for men and women is lower than the England average but is 10.1 years lower for men and 7.8 years lower for women in the most deprived areas of Lancashire than the least deprived areas. Around 19% of children live in low income families compared to 20% in England, with disparities between areas reflecting social inequity within the county.²⁹ This increases the generalisability of our findings to other settings.~~

Sexual orientation was based on reported sexual identity, not qualified by additional questions about attraction or behaviour. This could have resulted in ~~inclusion of these questions may have reduced potential~~ misclassification and underestimation of the non-straightsexual minority population due to factors such as fluidity and fear of disclosure.⁴⁹

~~This study did not explore the nuances in the non-straight category and investigate potentially important differences between the CYP who identify as lesbian, gay, bisexual and transgender.~~

Conclusion

The data collected through a routine school health needs assessment has enabled its opportunistic analysis in relation to risk factors for children in a sexual minority group. The findings are consistent with previous studies showing poor mental health for this group of children, and indicate they experience poor physical health too. The significance of the

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findings indicates that further research is required to explore how policy and services should be designed and delivered for this group of children.

Acknowledgments

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