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Online child and adolescent mental health surveys can be good enough

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Abstract

Purpose To assess the value and practicability of online child mental health surveys.

Methods Study 1 followed up an existing low-risk sample from the general population. Study 2 recruited a new high-risk sample via a parents' organization for children with a neurological condition. Both studies invited parents of 2–17 year olds to complete the online development and well-being assessment. Pre-existing data on the Study 1 sample made it possible to examine selective participation. **Results** Response rates were low (20 % for Study 1, 8 % for Study 2). Participation in Study 1 was lower for parents who rented rather than owned their home, for non-traditional families, for parents living in more deprived areas, and for Asian families. Nevertheless, studies 1 and 2 generally replicated the findings of previous interviewer-based surveys with higher response rates.

Conclusions Online surveys can be quick and easy to carry out and can potentially generate good enough data for service planning and other purposes despite low response rates, selective participation and missing data. Web-based assessments are a useful addition to the researcher's toolbox, but they do not render the other tools redundant.

Keywords Online assessment · Web-based surveys · Validity · Representativeness · Missing data

Introduction

A previous Norwegian study investigated the advantages and disadvantages of online child mental health surveys by comparing two waves of the same longitudinal study assessed with the same measure—the Development and Well-Being Assessment (DAWBA)—administered as a traditional interviewer-based survey in one wave and as an online assessment in a second wave [1]. Online administration was substantially faster and a quarter of the cost, but there were disadvantages. While initial participation rates were similar for interviewer administered and online data collection, online participants were much less likely to complete all sections of the interview. In addition, participation in the online interview was selective, with lower rates of full participation from less educated parents, single-parent families and immigrant families. Reassuringly, there were few major differences in the findings based on full and partial participation. In some but not all instances, point estimates of psychopathology (caseness rates or mean psychopathology scores) were reduced by partial participation, and there was minor attenuation of some correlations between putative risk factors and psychopathology. On the whole, however, the findings and their potential implications for service planning were similar.

There is increasing reason to question the traditional view that a high participation rate is an essential prerequisite for drawing valid conclusions. The traditional view is well exemplified by a quotation from a beginner's guide to research methods in psychiatry that was published by the Royal College of Psychiatrists in 1989 [2]. The glossary entry for response rate states: "Although there are no hard and fast rules, 90 % or above of the respondents would be considered a high response rate for most purposes: 70–80 % might be considered as acceptable." (p. 230).

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Response rates have dropped dramatically since then, with many studies failing to meet the 70 % benchmark [3]. In the meanwhile, evidence has accumulated that the link between response rate and validity is weak. A recent editorial [4] notes that “a low response rate does not automatically mean the study results have low validity, they simply indicate a potentially greater risk of this. Response rates on their own are not good proxies for study validity” (p. 107).

Perhaps a focus on response *rates* misses the point that the real threat to validity is not *low* participation but *unrepresentative* participation. A large survey based on a 1 % participation rate could generate valid results if that 1 % were representative. Conversely a high 90 % response rate would generate very misleading results if this completely missed the 10 % with disorder. However, even if selective participation can potentially be a major threat to validity, empirical and simulation studies suggest that survey findings can at least sometimes be “good enough” for drawing valid conclusions despite unrepresentative sampling. Previous studies in mental health and other areas suggest that selection bias is much more likely to affect point estimates such as prevalence than patterns of association [5–7]. Mathematical simulations confirm that regression models are only marginally affected despite range restrictions after selective dropout [7]. It is also striking that much of what we know about child development was originally derived from convenience samples of the children of middle-class White Americans (often recruited from newspaper adverts or faculty) and yet these findings have generally been replicated in more varied and representative samples.

While there would be substantial practical advantages if cheap online surveys were good enough for drawing valid conclusions, it would clearly be premature to jump to this conclusion on the basis of a few case studies and simulations, plus an analogy with developmental psychology. Further simulation studies would be useful, but the most persuasive evidence for many researchers, funders and policy makers is likely to be an accumulation of case studies demonstrating when online surveys do, and do not, generate results that are “good enough” for a range of purposes despite low or unrepresentative recruitment. With this in mind, the Department of Health in England commissioned two studies to investigate whether web-based surveys might be suitable successors to the nationwide surveys of child and adolescent mental health carried out by interviewers in 1999 and 2004 [8, 9].

The main motivation was to see if more could be done for less. Nationwide interviewer-based surveys are very expensive to mount, and even in relatively prosperous times, the 1999 and 2004 samples only secured one full follow-up each. Because longitudinal studies with repeated re-evaluations provide a unique window on incidence,

resolution and persistence, there would be advantages if using cheaper web-based surveys for initial and follow-up assessments provided a greater number of follow-ups for the same amount of money. In an age of increasing austerity when traditional nationwide surveys may become unaffordable, it is also important to establish whether affordably cheap online surveys might be better than nothing at all (bearing in mind that cheap but misleading survey findings would be worse than no survey at all).

This paper describes lessons learned about the validity and practicability of online mental health surveys on the basis of these two studies: one involving the follow-up of an existing low-risk sample from the general population, and the other involving a new high-risk sample via a parents’ organization for children with a neurological condition. In both studies, the observed prevalence of mental health disorders as determined by online surveys could be judged against the “benchmark” findings from previous interviewer-based studies.

Methods shared by the two surveys

Strengths and difficulties questionnaire (SDQ)

This 25-item questionnaire involves 5 scales of 5 items each: hyperactivity, emotional symptoms, conduct problems, peer problems and prosocial behaviour [10, 11]. The SDQ impact supplement asks about how much distress or impairment is caused by any problems identified, generating an ‘impact score’ [12]. The SDQ was only administered to parents in the two studies reported here. Symptom and impact scores can be combined to predict whether or not a psychiatric disorder is probable [13].

Development and well-being assessment (DAWBA)

The DAWBA is a standardized interview that can be administered by interviewers to respondents, or that can be administered online for completion by respondents themselves. In order to guide subsequent skip rules, the DAWBA is normally preceded by the SDQ. Subsequent DAWBA sections on psychopathology include questions that correspond closely to the ICD-10 and DSM-IV diagnostic criteria for emotional, behavioural, attentional, autistic, tic and eating disorders [14]. The focus is on current rather than life-time diagnoses. The initial questions for any given diagnosis are fully structured, with fixed response categories. When the answers to these closed questions suggest that symptoms of the relevant disorder may be present, supplementary open-ended questions are employed to elicit a description of the symptoms in the respondent’s own words: interviewers record verbatim

accounts; whereas online respondents type their answers into text boxes. The DAWBA sections on psychopathology are supplemented by one section on strengths and another on background factors (including physical and learning disorders, stressful life events, family factors and use of services).

Interviewers can usually persuade respondents to complete all sections of the DAWBA, whereas the online DAWBA presents respondents with a list of sections and encourages them to complete all of them, but cannot prevent them from logging off at any point [1]. Trained clinical raters review all the available material (including open-ended comments) before assigning diagnoses based on DSM-IV and ICD-10 diagnostic criteria (with only the ICD-10 diagnoses being presented in this paper). Further information on the DAWBA is available from <http://www.dawba.info>, including on-line, and downloadable versions of the measures and demonstrations of the clinical rating process. The κ statistic for chance-corrected agreement between two clinical raters has been reported as 0.86 for any disorder (SE 0.04), 0.57 for internalizing disorders (SE 0.11) and 0.98 for externalizing disorders (SE 0.02) [15]. There are different versions of the DAWBA for parents, teachers and young people aged 11 or over, but only parents were approached for the two studies reported here. After completing the online DAWBA, parents were offered the option of automated feedback linked to the opportunity to search for potentially relevant books, websites, helplines and services (as provided on www.youthinmind.info).

Ethical considerations

Permission was obtained from the Ethics Committee of the National Centre for Social Research, who agreed the wording of the consent forms and the sending of up to two reminders and a small gift (that was not conditional on participation) to members of Study 1. In addition, the trustees and executive committee of HemiHelp (including individuals with hemiplegia and parents of such individuals) reviewed and approved the proposal before relaying the invitation to participate to their members in Study 2.

Study-specific methods, results and preliminary discussion

Study 1: follow-up of a general population sample

The National Centre for Social Research (NatCen) carries out the annual Health Survey for England (HSE) on behalf of the NHS Information Centre. The 2009 HSE [16] asked parents about various aspects of one or two of their

children (but did not ask about these children's mental health). The survey also collected socio-demographic information about the parents and family as a whole: family composition; household income; housing tenure (owned vs. rented); social class; parental education; ethnicity; area of residence (urban vs. rural); region; and area deprivation (Index of Multiple Deprivation [17]). NatCen sent invitation letters to parents who had participated in the 2009 HSE and who had agreed to further contact. These parents were invited to complete online DAWBAs on a total of 3,552 children who were 2–15 year olds.

Study 1: selective participation

Parents of 725 of the 3,552 individuals (20.4 %) logged on to the website and completed at least the initial SDQ (26 % response rate for those allocated to receive two reminders and an unconditional gift; 13 % response rate for the remainder who received one reminder and no unconditional gift. Allocation was not based on any systematic selection criteria but simply followed the order of an internal ID number created for the 2009 HSE survey). It was possible to judge how participating parents differed from non-participating parents on the basis of the socio-demographic variables previously collected as part of the 2009 Health Survey for England. For the ordinal variables, there were highly significant linear trends for participation to rise with income ($p < .001$) and social class ($p < .001$), and to fall with area deprivation ($p < .001$). For the binary variables, participation was significantly lower for those living in rented accommodation ($p < .001$), those living with just one biological parent ($p < .001$) and those living in urban areas ($p < .005$). For categorical variables with more than two categories, there was an overall effect for geographical region ($p < .001$) and ethnicity ($p < .002$). The values of adjusted residuals demonstrated significantly higher participation in the Eastern and South Eastern regions, and significantly lower participation in the North West region and among British Asians.

Many of the significant univariate predictors were highly correlated with one another, e.g. low household income was closely related to low social class, living in rented accommodation and living in deprived areas. Multivariate logistic regression was, therefore, carried out to identify the variables that predicted participation even after adjusting for all the other predictors. Data were missing on less than 1 % of the sample for all variables except for household income (14 % missing). Having dropped household income, forward conditional regression was carried out with the remaining socio-demographic variables as the independent variables and with participation (as judged by completion of the initial SDQ) as the dependent variable. Region and ethnicity were treated as

categorical variables; the entry criterion was $p < .02$. There were four significant independent predictors (also shown in Fig. 1):

1. Parents who rented their home were less likely to participate than parents who owned their home outright or with a mortgage (odds ratio 0.47, $p < .001$).
2. Single-parent and reconstituted families were less likely to participate than families where both biological parents were resident in the household (odds ratio 0.74, $p = .006$).
3. Parents living in the more deprived areas were less likely to participate (odds ratio 0.92 per quintile increase, $p = .013$).
4. Asian families were less likely to participate (odds ratio 0.29, $p = .02$ than White families, $p = .007$).

Based on these four predictors, it was possible to generate a “propensity score” for each individual, i.e. the predicted likelihood of participating based on the four socio-demographic factors. In some of the analyses summarized in Table 2, the reciprocal of this score was then used to weight the sample in order to adjust for the over- and under-representation of specific socio-demographic groups.

Study 1: partial completion

Once parents had completed the SDQ online, they were presented with a menu of DAWBA sections (with titles such as “Depression” and “Hyperactivity and attention problems”). The website encouraged parents to complete all sections of the DAWBA—explaining that sections were

Fig. 1 Sociodemographic factors independently predicting participation in Study 1. From left to right: housing tenure (owner-occupied; rented), family type (traditional; single parent or reconstituted), increasing area deprivation by quintile, ethnicity (White, Mixed, Black, Asian). The horizontal dotted line represents the mean participation rate for the entire sample ($N = 3,552$ invited)

Table 1 Variation in the number of DAWBA sections completed in Study 1, and the relationship with disorder as defined by SDQ and DAWBA

Number of DAWBA psychopathology sections completed	Number of respondents (%) this applied to	Number (%) in this category who were predicted to have a disorder by the SDQ	Number (%) in this category who were assigned a clinical DAWBA diagnosis
None	120 (16.6 %)	1 (0.8 %)	Not rateable ^a
At least one, but not all ^b	127 (17.5 %)	17 (13.4 %)	21 (17.2 %)
All of them	478 (65.9 %)	21 (4.4 %)	31 (6.5 %)
Total sample	725 (100 %)	39 (5.4 %)	52 (7.2 %)

^a Not rateable because no DAWBA psychopathology sections had been completed

^b Mean number of DAWBA psychopathology sections completed = 4.1 (SD 4.0)

automatically very brief when it was clear that their child had no particular problems in that area. However, an online survey cannot prevent respondents abandoning a survey part-way through. Table 1 summarizes the number of DAWBA psychopathology sections completed on the 725 children whose parents had at least filled in an online SDQ (where a maximum of 13 DAWBA sections are relevant to 5–15 year olds, and 11 DAWBA sections to 2–4 year olds).

About two-thirds (66 %) of respondents did complete all the DAWBA psychopathology sections as requested. As judged from the SDQ, the children of these parents had slightly less psychopathology than the sample as a whole, just as their rate of subsequent DAWBA diagnoses was slightly below the rate for the sample as a whole. This is not what would be expected if these parents' motivation for completing every section was that they were particularly concerned about their children's mental health. Instead, completing every psychopathology section may have reflected parental conscientiousness and altruism, with them providing full details in order to help the research project as much as possible even though their own children were, on average, doing slightly better than the sample as a whole.

The 17 % of parents who did not complete any psychopathology sections of the DAWBA were the ones whose children had the lowest rate of probable disorders as judged from the SDQ (0.8 vs. 5.4 %, for the sample as a whole). This suggests that the main reason parents stop after completing the SDQ is because they have no cause for concern and, therefore, see no reason for choosing any DAWBA psychopathology section.

The 18 % of parents who answered some but not all DAWBA psychopathology sections had children with more than double the rate of probable disorders as judged from the SDQ. When parents do have problems to report, the relevant DAWBA sections take longer to complete. Perhaps parents compensate for this additional effort by focusing just on those sections that seem most relevant. Because the likely rate of disorder was more than doubled according to both the SDQ and the DAWBA, partial completion did not seem to have undermined the ability of the DAWBA raters to assign the expected proportion of diagnoses.

Study 1: distortion of prevalence

Given selective participation and partial completion, how distorted are the resultant prevalence estimates? It is obviously only possible to address this question if the findings of this online survey can be compared with a recognized benchmark. For the 5–15 year old age range, there are such benchmarks in the form of two large nationwide British surveys of child and adolescent mental health (B-CAMHS) in which the DAWBA was administered by interviewers: one cross-sectional survey in 1999 [8] and a second cross-sectional survey of a completely new sample in 2004 [9]. Table 2 includes the benchmark prevalences for broad diagnostic groupings from those two surveys, along with the corresponding prevalences derived from Study 1—shown both unweighted and weighted to adjust for selective participation by the socio-demographic factors described above and shown in Fig. 1.

It can be seen from Table 2 that the Study 1 prevalences are relatively close to the benchmark prevalences from 1999 to 2004 surveys based on much larger samples, multiple informants and individual interviewing. The exception is hyperkinesia, but this was based on a positive diagnosis in just three individuals in Study 1 and the 95 % confidence interval was very wide (0–1.7 %). Because behavioural disorders are more strongly associated with poverty and single parenthood than are emotional or ADHD disorders [9], it is not surprising that weighting that adjusts for the under-representation of children from less affluent backgrounds and non-traditional families has the greatest effect on rates of behavioural disorders.

The Study 1 sample was specifically chosen because its socio-demographic characteristics had already been studied, permitting adjustment for uneven participation. This is not true for most online surveys, where the researchers have little or no information about those who do not take part. However, the current findings suggest that lack of adjustment for non-participation would not be a disaster as far as prevalence estimates are concerned. The unweighted prevalence estimates did not correspond exactly to the

Table 2 Comparison of diagnostic prevalences in Study 1 with previous findings based on large interviewer-administered surveys of representative samples from the general population

ICD-10 Disorder	Prevalence in 5–15 year olds (Adjusted prevalence ^a)			
	B-CAMHS		Study 1	
	1999	2004	Not weighted	Weighted
	<i>N</i> = 10,438 (%)	<i>N</i> = 7,363 (%)	<i>N</i> = 462 (561) (%)	<i>N</i> = 462 (561) (%)
Any disorder ^b	9.5	9.6	9.6	10.7 % (8.8 %)
Emotional	4.3	3.5	4.4	4.5 % (3.7 %)
Behavioural	5.3	5.9	3.7	4.8 % (4.0 %)
Hyperkinesia	1.4	1.5	0.7	0.6 % (0.5 %)

^a Adjusted prevalences shown in brackets for Study 1 only. They are the prevalences calculated by including the 99 subjects aged 5–15 with a complete SDQ but no DAWBA data. In line with the findings reported in Table 1, “no DAWBA data” is taken to imply no DAWBA diagnosis

^b The sum of emotional, behavioural and hyperkinetic disorders does not necessarily add up to the rate of “any disorder” since (a) some individuals have more than one type of disorder, and (b) some disorders such as autism or anorexia are included in the total but are not classified as emotional, behavioural or hyperkinetic disorders

benchmark figures, but they are arguably “good enough” for service planning, for which ‘ball park’ figures are often all that are required.

Study 1: patterns of association

Can well-established associations between psychiatric disorder and other factors [9] be replicated in the Study 1 sample? The rate of any ICD-10 psychiatric disorder was examined in relation to four risk or outcome factors selected a priori. These factors were all parent-reported variables from the DAWBA background section. First, learning difficulties were associated with increased disorder: 35 % (7/20) versus 7 % (25/369) in those with and without learning difficulties (continuity corrected $\chi^2 = 16.45$, 1 *df*, $p < .001$). Second, multiple adverse life events in the previous 12 months were associated with increased disorder: 6 % (16/268) for no events; 7 % (7/97) for one event; and 38 % (9/24) for two or more events ($\chi^2 = 29.18$, 2 *df*, $p < .001$). Third, financial difficulties in the family were associated with more disorder: 7 % (18/260) for no difficulty; 8 % (8/105) for a little difficulty; and 27 % (6/22) for a lot of difficulty ($\chi^2 = 11.15$, 2 *df*, $p < .001$). Finally, the presence of disorder predicted previous contact with child and adolescent mental health services: 47 % (15/32) versus 2 % (6/350) for those with

and without disorder, respectively (continuity corrected $\chi^2 = 106.57$, $1df$, $p < .001$). Though far from exhaustive, these unweighted analyses do confirm that an online survey can detect meaningful patterns of association.

Study 2: a new sample of children with a neurological condition recruited via a parents' organization

HemiHelp is a voluntary organization for childhood hemiplegia, which is also known as hemiplegic cerebral palsy. This is a condition involving weakness or stiffness of just one side of the body (either left or right) that dates back to pregnancy, birth or childhood. It affects up to one in a thousand individuals and is usually due to a malformation, stroke, infection or accident. Previous research has shown that around half of affected individuals have a psychiatric disorder, often interfering more with the individual's (and family's) quality of life than the physical disability itself [18]. HemiHelp sent a single email to roughly 2,000 families with hemiplegic children aged between 2 and 17 years, inviting them to complete the DAWBA online. No reminder emails or gifts were sent. Parents completed at least the initial SDQ on 165 individuals with hemiplegia (41 aged 2–4, 124 aged 5–17), representing a response rate of around 8 %. Enough information was collected to allow a clinical rater to generate a DAWBA diagnostic rating on 144 subjects (87 % of the 165 responders).

Study 2: selective participation

HemiHelp is an organization whose membership may itself be an unrepresentative sample of all children and adolescents with hemiplegia, and any unrepresentativeness might have been compounded by selective participation in the online survey. Without permission to access HemiHelp's records to identify the characteristics of non-responders, it was not possible to assess selective participation directly. However, previous studies of representative samples of children with hemiplegia have consistently reported a modest excess of males over females, and of right- over left-sided hemiplegia. Sample 2 was compared in these respects with a representative sample of children with hemiplegia that had been studied previously: the London Hemiplegia Register [18]. The proportion of boys in Study 2 was 59 % (98/165), as compared with 61 % (91/149) from the London Hemiplegia Register ($\chi^2 = 0.021$, $1df$, $p = .65$). Data on the laterality of hemiplegia was only available on the 102 subjects in Study 2 whose parents had completed the background section of the DAWBA. The proportion of right-sided hemiplegia was 63 % (64/102) in Study 2, as compared with 59 % (88/149) from the London Hemiplegia Register (Chi square = 0.035, $1df$, $p = .85$).

In these respects, at least, the HemiHelp volunteers were representative of hemiplegia. By comparison with Study 1, the number of participants in Study 2 was too small to justify analyses of risk factors and missing data.

Study 2: distortion of prevalence

Table 3 compares the prevalence of the main groups of psychiatric disorders for the children with hemiplegia who were assessed in detail as part of the London Hemiplegia Register [18] and for the children with hemiplegia in Study 2. The London Hemiplegia Register used a clinical rating approach similar to that incorporated into the DAWBA [19]. The two samples were not matched for age since previous findings suggest a stable rate of psychiatric disorder from 2–16 years of age [18]. Despite the lack of exact matching, the prevalence findings for most disorder groups are strikingly similar for the older and more recent study, with the exception that the rate of autistic spectrum disorders (ASDs) was higher in the recent survey (12 vs. 4 %).

A previous study of childhood hemiplegia [18] reported that 41 % of psychiatric diagnoses were non-operationalized, involving clinically significant distress or impairment as a result of symptoms that did not fully meet the criteria for any operationalized diagnosis. Such non-operationalized diagnoses accounted for 38 % (40/104) of all diagnoses in Study 2. The online survey also replicated earlier reports that hemiplegia does not increase the prevalence of all symptoms and disorders to the same extent [20]. In line with these previous findings, anxiety and phobic diagnoses accounted for nearly all the operationalized emotional disorders in Study 2: 13 individuals were diagnosed with

Table 3 Comparison of diagnostic prevalences in Study 2 with previous findings based on large interviewer-administered surveys of representative samples with hemiplegia

	Prevalence of psychiatric disorder (%)	
	Clinical raters' diagnosis on intensively studied 6–10 year olds from the London Hemiplegia Register, $N = 149$ (%)	DAWBA diagnosis from the HemiHelp online survey of 2–17 year olds, $N = 144$ (%)
Any disorder	61	53
Emotional disorder	25	27
Behavioural disorder	24	22
Hyperkinetic disorder	10	7
Autistic spectrum disorder	4	12

specific phobias, 7 with separation anxiety, 7 with generalized anxiety and 4 with social phobia. Other operationalized emotional disorders were rare: 1 individual with obsessive–compulsive disorder, and none with depression, post-traumatic stress disorder, panic disorder or agoraphobia. Also in line with previous findings, operationalized behavioural disorders were all oppositional defiant disorders ($N = 16$), there were no instances of more serious antisocial behaviour corresponding to DSM-IV conduct disorder.

Overall discussion

For enthusiastic supporters of online child mental health surveys, the implications of these two studies are mixed. On the one hand, both of the online surveys replicated in broad terms the findings of earlier interviewer-based surveys, and did so rapidly and with relatively little effort—in line with the previous Norwegian finding that web-based surveys of child mental health can be substantially cheaper and quicker than traditional surveys using interviewers [1].

The online follow-up of the 2009 Health Survey for England generally mirrored the main findings of large interviewer-based national surveys of representative populations of British children and adolescents [9]. This was, admittedly, a broad rather than an exact replication. Does this matter? To focus on the most glaring discrepancy, how important is it that the prevalence of hyperkinesia according to the online survey was only half of what it should have been according to the interviewer-based surveys? If the broad confidence interval was ignored and the prevalence was directly translated into clinic budgets, this discrepancy could clearly lead to disastrous under-provision for children with hyperkinesia. However, previous studies have repeatedly shown that most children with psychiatric disorders do not receive any specialist help [21]. Thus, even a substantial underestimate of prevalence leaves the main message unchanged, namely that the need for services outruns provision. In some circumstances, indicative rather than exact prevalence findings may be sufficiently accurate.

The potential for speeding up surveys is vividly illustrated by a comparison of two studies of children with hemiplegia that were carried out roughly 20 years apart. In a study initiated by the author in 1987, about 5 person-years were devoted to locating and then assessing in detail a large representative sample of children with hemiplegia [18, 20]. In 2010, a single email sent by a voluntary organization for childhood hemiplegia to its members resulted in around 8 % taking part in an online survey (Study 2). Despite this low response rate, the results described in this paper generally replicated most of the

findings of the original survey, doing so much more rapidly and with substantially less effort. The only major difference was a higher rate of autistic spectrum disorders in the more recent study—a difference that could have several explanations. First, parents may have been more likely to participate in the online survey, if their children had autistic features. Second, concepts of autistic spectrum disorders has become increasingly broad over the last 20 years [22]. Third, online interviewing might be particularly suitable for recruiting the parents of autistic children. The high and unpredictable demands placed on parents by autistic children may have allowed them to participate in online surveys in quiet moments even when they would have found it impossible to schedule an interview at a predictably good time.

While the findings discussed so far are provisionally encouraging for proponents of online surveys, other findings confirmed that web-based surveys have disadvantages, in line with those reported by the previously cited Norwegian study [1]. Computers are less persuasive than interviewers, both in terms of getting potential respondents to take part in a survey, and also when it comes to encouraging participants to complete a long and potentially tedious assessment in full. Just as it is harder to walk out of a theatre than to flip between television channels, so it is harder to say ‘no’ to an interviewer—or give up part-way through—than to do the same to a computer.

Both of the studies reported here have low response rates and Study 1, like the previous Norwegian study, suggests that online surveys systematically under-represent children and adolescents from disadvantaged backgrounds. There is scope for improving participation rates and representativeness by modifying survey design [3], as with the use of reminders and non-contingent gifts in Study 2. However, even if online surveys still underestimate prevalence despite reminders and incentives, the resultant “ball park” estimates may be good enough for some purposes. Nevertheless, policy makers should remember that online surveys may generate prevalence estimates lower than those based on traditional survey designs. Thus, it would be a mistake to reduce funding to local services solely on the basis that a local web-based survey reported lower prevalence rates than those from national norms based on personal interviews. Unrepresentative sampling is generally less of a threat to findings on patterns of association [7]. In line with this, the findings of Study 1 on the correlates of psychiatric disorder were in line with previous interviewer-based studies. Thus, it will often be possible to extract useful conclusions from online surveys of convenience samples even if these are not perfectly representative (and it is worth remembering that response rates of 50–70 % in traditional interviewer-based surveys leave plenty of room for selection bias here too).

Even if online surveys are accurate enough for some purposes, there is an additional political dimension. Whereas a charity or school may be happy to use online surveys on the basis that these can provide good enough information quickly and cheaply, a national survey to assess children's needs might undermine its own credibility if it relied exclusively on online assessment—a method known to under-sample disadvantaged groups and thereby prone to systematically underestimate need. Online assessments may, therefore, be unacceptable as the *only* assessment method for surveys that need to be representative to avoid political controversy. By contrast, even in the most politically sensitive of surveys, online assessments may be highly desirable as a *supplementary* assessment method. Some respondents who are not willing to be interviewed in person may be willing to provide their answers online. For example, parents reluctant to schedule an interview because of unpredictable domestic or work demands may be willing to complete the online interview in quiet moments. Offering respondents a choice of interviewer or online assessments can potentially increase response rates while also reducing the average cost per achieved interview.

A higher proportion of missing data is a further disadvantage of online surveying. Only two-thirds of the respondents in Study 1 completed all the psychopathology sections of the interview in full. Fortunately, it seems likely that the main reason parents missed out a section was because they could tell from the section's title that their child did not have that sort of problem. Thus, although it would be more convenient for statistical analysis if all respondents answered all sections of the online DAWBA, missing sections probably did not undermine the ability of the DAWBA to detect the expected proportion of disorders. Interpreting “no answer to this section” as “probably no serious problem in this area” is a simple but defensible approach to missing data.

This paper has significant limitations. First, while the two studies reported in this paper add to the meagre evidence base [1] that online surveys of child mental health *can* generate valid and useful findings, that is clearly not evidence that online child mental health surveys *inevitably* generate results that are as valid and useful as those generated by traditional survey methodology. Many more case studies, supplemented by data-based simulations, are needed to establish the relative balance of advantages and disadvantages of novel and traditional survey approaches. A second limitation is that this paper is based on just one specific online assessment, and restricts itself to parent-provided information. A greater range of measures and respondents would increase generalizability.

Conclusion

The two studies reported in this paper add to the evidence that online surveys of child and adolescent mental health can be quick and easy to carry out, and that while low response rates, selective recruitment, and problems with missing data are significant challenges, online surveys can *at least sometimes* generate good enough data on the prevalence and associations of psychiatric disorders. While further studies will undoubtedly refine our understanding of when online surveys are likely to be good enough for particular purposes, it seems clear that web-based surveys are a potentially useful addition to the researcher's toolbox, but do not render the other tools redundant.

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