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“How hard could it be?” A descriptive analysis of errors made on a validated lifetime physical activity questionnaire

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Abstract

Background—Measuring historical physical activity in epidemiologic research depends on self-report. We aimed to describe data reporting errors women made in completing two validated questionnaires – Lifetime Physical Activity Questionnaire (LPAQ) and Occupational Questionnaire (OQ).

Methods—Participants, 229 women aged 38 – 65 years, completed questionnaires on paper (n=160) or by web interface (n=69). One research assistant collected questionnaire data, identified potential errors and contacted participants to trouble-shoot errors.

Results—Women made mean 9.7 (SD 11.2) errors on paper and 7.1 (SD 6.2) errors on electronic versions of the LPAQ and 2.6 (SD 3.8) and 1.1 (SD 1.4) errors on paper and electronic versions of the OQ, respectively. Fewer mistakes were made on electronic versions of both questionnaires combined (8.5 ± 6.1) when compared to the paper versions (12.7 ± 13.1). Only ~2% of the sample

completed all questionnaires without detectable errors. The most common errors were reporting activities or frequencies inconsistently between past year survey and the current age epoch, reporting more years than allowed by age epoch and missing information.

Conclusions—Despite the implications of “self-report” questionnaires, we recommend researchers provide participants with additional instructions, either verbally or as written tip sheet or both, and follow-up after questionnaire completion to correct mistakes as needed.

Keywords

Methods; epidemiology; survey research

The measurement of physical activity in epidemiologic research depends largely on self-report methodology, especially if lifetime physical activity is the exposure of interest. While it is not plausible to determine the precision of self-reported lifetime physical activity by questionnaire, this method has been generally accepted for classifying individuals by levels of physical activity¹. Using self-reported data requires efforts to optimize data quality to guard against the possibility of participant misclassification. Recently, Ainsworth et al. presented a model designed to improve the assessment of physical activity using questionnaires². They identified a six-step process that considers identifying the need for assessing physical activity, selecting a questionnaire that matches the respondents' abilities, and suggestions for administering, analyzing, scoring, and interpreting a questionnaire. The reproducibility of lifetime physical activity questionnaires is adequate and methods to improve recall have been outlined by leaders in the field^{1,3}. In 2007, Ferrari et al. applied a statistical measurement error correction procedure to the Friedenreich Past Year Total Physical Activity Questionnaire to quantify the effect of measurement error on the association between physical activity exposures and outcomes of interest^{4,5}. Others have also reported on modeling measurement error in recall data to provide more accurate estimates of long-term physical activity⁶.

In addition to errors related to accurate recall, there are also errors related to how participants complete questionnaires. A better understanding of common data reporting errors can help researchers develop procedures to improve overall data quality. As we embarked on a study examining the associations between lifetime physical activity and pelvic floor disorders in women⁷, we found little guidance in the literature specifically about how to reduce or correct for errors commonly made by participants who completed self-administered lifetime physical activity questionnaires^{6,8}. In this technical report, we aim to describe errors made by women who completed the Lifetime Physical Activity Questionnaire (LPAQ) described by Chasan-Taber and the lifetime Occupational Questionnaire (OQ) described by Friedenreich^{3,5}. We further describe the differences between errors participants made when completing questionnaires on paper or in electronic format by web interface. Lastly, we describe our suggested approach to reducing and correcting errors made on paper and electronic versions of the LPAQ and the OQ.

Methods

Sample

Participants in this study were the first 371 women enrolled in the Physical Activity and Pelvic Floor Disorders Study (PHACTS), a double case-control study on the influence of lifetime and past year physical activity on stress urinary incontinence and pelvic organ prolapse (POP)⁷. While there are multiple health benefits of physical activity for most, activities that significantly elevate intra-abdominal pressure, such as heavy lifting or impact exercise, may increase the risk for pelvic floor disorders in some women⁹. Participants were generally healthy women recruited from primary care clinics or from the community between 10/2008 and 1/2013. Exclusion criteria for the parent study included age <39 or >65 years, pregnant or 6 months postpartum, body mass index (BMI) < 18.5 or > 40 kg/m², prior surgery for a pelvic floor disorder or any other condition that affected the pelvic region, or any health condition that prohibited customary physical activity or ambulation, such as reliance on a mobility aid, diagnosis of multiple sclerosis, stroke, congestive heart failure, or current treatment of cancer. To be included in the analysis of errors, participants had to return all questionnaires and complete quality control procedures (described below) so that error number and type could be confirmed.

We limited our sample in this sub-study of PHACTS to the first 371 enrollees for two reasons. First, this initial group interacted with only one member of the study staff relative to physical activity quality control procedures so there would be consistency in the collection of error data. Second, we intended to use the information in our early data collection efforts to improve our procedures for the remainder of the study. Because tracking errors in detail, as we did for this manuscript, requires significant resources, we did not continue to do so after collecting data on these first 371 women.

The Institutional Review Board of the University of Utah approved all recruitment and data collection procedures and all participants provided written and informed consent.

Procedures

Women completed on-site examination, which included a pelvic examination and measurement of weight (kg) and height (cm). Other than basic demographic information, the remainder of study instruments was completed at home.

Comprehensive lifetime and past year physical activity assessment included leisure time, household, outdoor and occupational domains (see appendix). Leisure time, household and outdoor measures of physical activity were assessed by the LPAQ³ and occupational activity by the OQ⁵. The LPAQ provides reliable estimates of physical activity from the age of menarche to current age. Evidence of validity and reliability has been shown for past year estimates of physical activity³. The LPAQ is divided into epochs of past year, 51 to 65 years, 35 to 50 years, 22 to 34 years and menarche to 21 years. For each epoch, the LPAQ indicates the maximal number of years included in each epoch. The LPAQ includes lists of activities for leisure time and household domains. We included outdoor activities separate from traditional household activities (i.e., childcare and housework) such as heavy work done in a rural setting or home improvement, since many of those activities are strenuous

and important in the study of pelvic floor disorders. We placed leisure time, household and outdoor activities on separate pages to assist with clarity and recall. The instructions, provided verbatim, state that participants should check the activities on the lists, by domain, that were done regularly (at least 10 times) over the lifetime. Opportunity is provided at the end of each list to add activities by domain, if necessary. For each activity checked, participants were instructed to record the typical number of hours per week and the number of months per year the activity was performed. For past year, participants were instructed to consider the past 12 months, and to report only hours per week and number of months. The report of past year physical activity overlapped with the most recent age epoch, since the most recent age epoch included all data up to the current age. For all epochs except for the past year, participants also indicated how many years within that epoch they did a particular activity for the hours and months reported.

Because the LPAQ does not include occupational activities, we included the OQ sub-scale from the Lifetime Total Physical Activity Questionnaire. This also has sound reliability properties, but differs from the LPAQ as it was originally intended to be administered by interview and does not include past year or specific age epochs. The OQ instructs participants to report all jobs of at least one month in duration, paid or volunteer, done over the lifetime. For each job listed, the start and end age, months per year, days per week, and hours per day were reported. Additionally, participants estimated an intensity value from 1 to 4 for each job, with a written definition for each intensity level provided at the bottom of the form.

The LPAQ and OQ were offered as paper and electronic forms. Paper forms were offered more often than electronic forms initially as there was a time lag for completion of the electronic version of the questionnaires. Participants chose to complete paper or electronic questionnaires, depending upon their access to and familiarity with computers. However, to facilitate a separate reproducibility study, some women with no preference for questionnaire type were randomized to paper or electronic formats. Electronic versions of the form were only accessible via a computer with Internet access. The paper LPAQ form appeared the same as the original with the exception of some added activities, the separation of domains by page to increase font size and alternate lines were shaded to help women track activities across the page. The electronic form included lists of activities, by domain, on an initial screen, with the same instructions provided on the paper form. After checking the activities done, participants clicked a “save and continue” button on the screen, which progressed to another screen with the past year and all age epochs. On this screen, only the activities checked on the previous page were visible to the participant. As with the paper form, participants reported the typical number of hours per week, months per year and years per epoch (except for past year) for each activity. The electronic version was unable to recognize a range of numbers or non-numerical information and therefore alerted participants with an error message. These specific types of errors had to be corrected prior to the participant moving to the next section of the questionnaire. The electronic version of the OQ appeared almost identically to the paper version. For occupation intensity, a drop down list was provided for participants to choose an intensity value from 1 to 4. All of the instructions, including the explanation of intensity, were the same as on the paper form.

One graduate research assistant in exercise and sport science (MEN) reviewed all completed LPAQ and OQ paper and electronic forms. The review process was guided by a manual of operations written by one of the authors (JMS) with input from the graduate assistant. The graduate assistant highlighted errors directly on the paper forms. For electronic forms, errors and other areas of discussion with the participant were indicated on the database in a comments box at the bottom of each form.

After reviewing the LPAQ and OQ, the graduate assistant phoned or emailed participants to inquire about errors made on these two questionnaires (see Tables 1 and 2 for complete lists of errors recorded). In brief, errors included missing data, data reported as ranges, answers written as text instead of as numbers, unusually high or low levels of physical activity, and activities in different domains that appeared to overlap, such as reporting babysitting and childcare in the same time period. Errors could only be confirmed when participants were contacted after questionnaire completion. One category of errors, incorrect information, was specifically created for the times when the research assistant suspected a data reporting error of one type, but upon speaking with the participant, learned that the error reflected something different. For example, a woman who provided incomplete data for a particular activity would have appeared to make an error labeled as missing data. Upon contact, if the participant acknowledged that she forgot to delete the partial activity information because in fact, she didn't do the activity, the error would have been categorized as incorrect information. Once errors were confirmed, data on the number of each type of error for paper and electronic LPAQ and OQ questionnaires were entered into a spreadsheet and later into a database for further analysis.

Statistical Analysis

Descriptive statistics of our sample, including age, parity, BMI (wt kg/ht m²), health conditions, race and ethnicity, education, and self-reported health were generated for those who did ("completers") and did not ("non-completers") complete all procedures required for analysis of error data. The sum of errors made by type per participant on the paper and electronic versions of the LPAQ and OQ was calculated, as well as the mean and standard deviation for total errors made on each version of the two physical activity forms. Error rates for paper vs. web administration were compared by Poisson regression scaled by the deviance to adjust for overdispersion, using SAS v. 9.3. We chose not to statistically compare specific error types made on the LPAQ and OQ since this sub-study of PHACTS was not powered to detect such differences. All remaining statistics were completed using Microsoft Excel version 2007.

Results

Between 10/3/08 and 5/27/10, 371 participants were enrolled into the parent study. After completing the LPAQ and OQ, one was found to be younger (<39 years) and three heavier (BMI>40) than allowed for the parent study; we included them in this current study as we could find no reason to believe these factors would influence the number or type of errors made on physical activity questionnaires. Seventy three (19.7%) participants did not return the physical activity forms. Of those that did return the forms, we were unable to contact

participants in order to perform quality control measures for 69 (18.6%) data sets. Therefore, 229 (61.7% of the recruited sample) provided both questionnaires and data quality control measures that included assessing errors.

There were no statistically significant differences between women who did and did not complete both questionnaires and data quality control measures relative to age, race, BMI, education level, parity, and self-reported health status. Amongst completers, mean age was 50.4 years (SD 6.9), mean body mass index was 25.8kg/m² (SD 4.9), 92% were Caucasian, and 88.6% had at least some college education.

On average, women made a mean of 9.7 (SD 11.2) errors on the paper and 7.1 (SD 6.2) errors on the electronic versions of the LPAQ. The types of mistakes made on the LPAQ are summarized in Table 1. The most common type of error was reporting data inconsistently for past year and current age epoch. For example, a 45 year-old woman who recorded 1 hour a week of jogging for 9 months in the past year would also be expected to record jogging in her current age epoch of 35-50 years. If she did not, this was considered an error. Other common errors included missing information, stating that activities were done for more years than present in a given epoch, and incorrect information. Leaving spaces blank triggered an error, as did reporting partial data for an activity, yet sometimes this could have indicated missing information and other times it was incorrect information. In some cases, partial data indicated incorrect information, but the participant failed to note this on the paper form or to delete partial information electronically.

On average, women made a mean of 2.6 (SD 3.8) and 1.1 (SD 1.4) errors on the paper and electronic versions of the OQ, respectively, summarized in Table 2. The most common error made on the paper version of the OQ was reporting a range rather than a single number; this problem was absent on the electronic version. In addition to the above problems described on the LPAQ, also seen on the OQ, another common error on the OQ was a failure of the stated intensity to describe multiple aspects of the reported occupation. Some jobs reflect light activity for some of the time while other times lifting could be prominent, such as in waitressing. Because we are interested in strenuous lifting activities in relation to pelvic floor disorders, we wanted to correctly identify varying aspects of occupational intensity. In some cases, a “mean” intensity for the occupation was reported, which may be suitable for understanding metabolic activity, but is not helpful for understanding how strenuous an occupation is.

Only 7 of 160 paper and 4 of 69 electronic versions of the LPAQ were completed without errors. For the OQ, 45 of 160 (28%) paper and 29 of 69 (42%) electronic versions were completed without errors. However, for paper versions of both questionnaires combined, only 3 were completed without errors and for electronic versions, only 2 were completed without errors. Fewer mistakes were made on electronic versions of both questionnaires combined (8.5±6.1) when compared to the paper versions (12.7±13.1). Error rates in the paper-based surveys occurred statistically significantly more often than in the web-based surveys (p=0.0032 by Poisson regression.)

Discussion

Our data illustrate that many errors were made when women self-reported physical activity over their lifetimes and often the same mistake was made more than once by the same participant. Only 5 participants, approximately 2% of the women who completed all study procedures, did not make any errors on the LPAQ and OQ. At least one mistake made consistently in both versions of the LPAQ, “reported more years than allowed by epoch”, indicated that women either did not read or did not understand the instructions provided on the questionnaire. For each age epoch, the LPAQ provides the maximal number of years possible. For those who made this mistake, it was done an average of 4.5 times on paper and 6.1 times on electronic LPAQ questionnaires. These and other errors were made despite over 70% of our sample having at least some college education and 22.9% with a graduate or professional degree. Without the quality control procedures we implemented to correct errors, it is possible that estimates of physical activity would have misclassified our participants.

The results of the Poisson regression indicate that fewer errors were made by those who completed electronic forms versus those who completed paper forms. Collecting data electronically allows for the application of database programming to alert participants when reported data are inappropriate. Indeed, we eliminated the possibility of errors made associated with text answers, poor handwriting or data reported as a range of values, all of which were observed on paper forms. Given the high number of errors we found relative to the number of years reported by age epoch, it would have behooved us to program the maximal number of years by age epoch for each participant in our electronic version of the LPAQ. It is attractive to consider collecting all data electronically to eliminate potential errors associated with data entry by participants and study staff, yet this approach would limit participation to those with computer literacy and access and therefore impact the generalizability of results.

While those who completed electronic questionnaires did so with fewer errors than those who completed paper questionnaires, this type of administration is not without its difficulties. In some instances, perhaps due to user interface error or network connection problems, participants lost entire pages of completed data, which caused great frustration for these individuals. Because instruments were completed without direct involvement of study staff, it is impossible for us to know why these electronic data were lost. In addition, electronic forms do not allow participants to preview the complete activity lists by page as with paper forms. In some cases, participants who completed electronic forms added activities such as “gardening” to the leisure form, when this activity was already included on the list of outdoor activities. Sometimes this resulted in a participant reporting the same activity twice. Yet, further refinement of instructions and programming may improve these issues, as the benefits of electronic administration in an increasingly tech-savvy population seem to outweigh the problems. Paper forms, despite their limitations, are still necessary for those who have limited or no computer and/or network access or literacy.

The LPAQ was attractive to us since it included the self-report of past year and lifetime physical activity, as both were of interest to us in the study of pelvic floor disorders. The

description of the LPAQ by Chasan-Taber et al. does not specifically state whether past year physical activity data should overlap with or be distinct from physical activity reported in the most recent age epoch, but overlap is implied by the questionnaire format³. Therefore, we instructed participants to report physical activity in their most recent age epoch up to their current age and their physical activity for the past year over the past 12 months. Despite taking what we believed to be the least confusing approach, over 60% of our sample made the mistake of inconsistently reporting physical activity done in the past year and in the most recent age epoch. If an activity was reported for the maximal number of years in the most recent age epoch and not reported for the past year, then the past year physical activity would be underreported. On the other hand, if an activity was reported for the past year, but not in the most recent age epoch, then physical activity for that epoch would be underreported, but would be less affected than past year if that epoch contained several years.

Most of the errors completed by the participants in the early stages of questionnaire administration for the PHACTS study are best characterized by a failure to read and/or understand instructions. This was true for inconsistent data reported for past year and most recent age epoch, for reporting more years than allowed by epoch or an impossible number of months, or providing text answers when a number was requested. The remainder of the data reporting errors seems to be a function of the complexity of the questionnaires and the extensive use of memory and attention to detail. As evidenced by the questionnaire formats in the appendix, there are many steps required for questionnaire completion. In an interviewer-administered format, as most lifetime questionnaires are structured, such errors in reporting could be corrected at the time of the interview. However, special issues clearly arise when lifetime physical activity is assessed by self-report. It is therefore up to the user community to optimize instruments for widespread use.

Altschuler et al. provided insight into research participant comprehension of physical activity questionnaire terminology and instructions¹⁰. They found that participants sometimes reported the same activity more than once on the same questionnaire. In administration of the LPAQ, Chasan-Taber reported that participants had the tendency to over report walking³. We recorded a dual reporting of activities specifically when there was overlap between the OQ and the LPAQ. In some cases, especially with respect to household activities, women reported extraordinarily high hours per week (ie, 50-80) for 3 to 4 activities, which, alone or added to other reported activity for the same time period, would have accounted for more hours than exist in a week. While we categorized such questionable numbers as errors, women had difficulty separating time spent doing specific household activities, stating that they did them at the same time.

Other person-factors that can increase errors in reporting of physical activity data are the interaction of age and the questionnaire format. McBride, et al. observed that older participants tended to have a greater number of omission errors when they were asked to answer questions in a skip pattern. Also, open-ended questions, which require the participant to determine a response from their previous experiences, often have a greater number of reporting errors¹¹. Such errors due to unreliable reporting and inability to recall variations in

physical activity behaviors over time can lead to random error within a study that can attenuate associations with study outcomes.

A strength of our study is the uniform collection of error data by the same research assistant. This one individual was guided by a manual of operations to check all physical activity forms, note potential errors, and contact participants with questions. Our ability to compare mistakes made by paper and electronic means of data collection is innovative and demonstrates that when possible, use of electronic versions of forms may reduce errors.

Our approach to describing errors made on physical activity questionnaires has limitations. We did not prospectively gather cognitions or reasons surrounding why participants made data reporting errors, only that errors of a specific type were made. Therefore, we cannot fully understand the cognitive processes associated with the mistakes made by our participants as they completed the LPAQ and the OQ. Women completed their preferred method of questionnaire administration, or if they had no preference, were randomly assigned to one method. It is possible that more errors would have been made had women completed questionnaires in a format not preferable to them. Further, about 38% of our sample did not complete all study procedures to allow the confirmation of errors. Roughly half of this group did not return questionnaires at all, and many of these women cited the length of the forms as a deterrent. The other half completed forms that we subsequently classified as not analyzable because of major errors, which could not be corrected since attempts to contact these participants failed. Therefore, our error descriptions may not be representative and we suspect reflect conservative estimates. Our sample is biased since women were educated (~70% with at least some college education) and mostly Caucasian. It is possible that different types of errors may be reported in more diverse populations. Lastly, the OQ was originally intended to be administered as an interview and we asked women to complete it as a self-report questionnaire, as is frequently done by others. While women made relatively few mistakes on the OQ compared to the LPAQ, these mistakes may not have occurred if the OQ had been administered as interview.

After examining the patterns of errors our participants made over the course of this study, we made modifications to our approach in administering the LPAQ and OQ. First, our research coordinators who were largely responsible for recruiting participants gave enhanced instructions to participants including a description of the extensive nature of the LPAQ and OQ and provided detailed instructions on how to complete the questionnaires. Some women, depending upon the recruitment strategy, were also provided a written tip sheet, detailing the correct data entry format and the most common errors made. None of the data reporting errors described in this study were collected from women who received enhanced questionnaire instructions or a written tip sheet detailing common data reporting errors. While it was always in our protocol to contact participants to clarify potential mistakes made on all study instruments, we emphasized that the main reason they may be contacted after they completed the questionnaires was related to these very common mistakes made by others.

The LPAQ followed guidelines that in theory limit errors: avoiding using unfamiliar terminology and providing standardized examples and instructions. However, given that

completion errors occur despite these measures, it is incumbent on researchers to set in place protocols for finding and trouble-shooting such errors².

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Appendix

Format of the Lifetime Physical Activity Questionnaire and the Occupational Questionnaire

Instructions for the LPAQ:

STEP 1: Please place a **check mark** in the first column next to each activity that you have ever participated in more than 10 times during your lifetime.

STEP 2: For those activities you have checked, **proceed to the right** answering the questions in the columns above.

Have you ever participated in any of the following?	During the past year		During ages 51–65 years (a 15 year span) If younger than 51 skip to next column		During ages 35–50 years (a 15 year span)		During ages 22–34 years (a 12 year span)		Between age of onset of menstruation to 21 years		
	# of months	Typical # of hours per week	# of years (15 max)	Typical # of months per year	Typical # of hours per week	# of years (15 max)	Typical # of months per year	Typical # of hours per week	# of years (10 max)	Typical # of months per year	Typical # of hours per week
Activities (see list below)											
Check if yes											

Leisure Activities: Walking for exercise (outdoor, indoor at mall, treadmill); Hiking; Stair-climbing machine; Jogging (outdoor/treadmill); Bicycling (stationary/outdoor); Horseback riding; Dancing (social, ballet, tap); Gymnastics; Calisthenics/toning exercises; Yoga; Aerobics/Jazzercise; Lifting weights (heavy); Swimming for exercise (i.e. laps); Rowing/canoeing, Kayaking/rowing machine; Water skiing; Skating (ice, roller, in-line); Tennis; Other racquet sports; Softball/baseball; Golf (use golf cart); Golf (walking); Volleyball; Basketball; Bowling; Soccer; Downhill skiing; Cross country skiing; and Other.

Household Activities: Lifting and or carrying children or dependent elder at home; Grooming an feeding children; Playing with children (walk/run with them); Light housekeeping (sweep/dust); Heavy housekeeping(scrub floors/vacuum); Carrying loads over 30lb (bags of salt, dog food); Lifting > 30lb from counter height; Lifting > 30 lb from floor; Moving furniture without assistance; Climbing more than 10 flights of stairs per day; and Other.

Outside Activities: Gardening/yard work; Heavy garden work (shoveling, turning over soil); Mowing lawn with push mower; Snow shoveling by hand; Baling hay; Carrying large pails of water or feed; Chopping wood; Heavy manual work (handling materials > 50lb); Heavy carpentry; and Other.

Instructions for the Occupational Questionnaire:

Please think back to paid or volunteer jobs you have had that last at least one month in duration. Starting with your most recent or current job, provide a brief description, indicate the duration, and rate the intensity of job using the 1-4 scale provided below. Jobs can include work done in your home, but should not be the same as housework or yard work activities reported on other pages of this questionnaire.

Activity No.	Description of Occupational Activity	Age Started	Age Ended	No. months/year	No. days/ week	Hours/ day	Intensity of Activity (1,2,3,4)
1.							
2.							

Intensity of occupational activity defined as:

1. Jobs that require only sitting with minimal walking
2. Jobs that require a minimal amount of physical effort such as standing and slow walking with no increase in heart rate and no perspiration
3. Jobs that require carrying light loads (5-10lb), continuous walking, mainly indoor activity and that would increase the heart rate slightly and cause light perspiration
4. Jobs that require carrying heavy loads (>10 lb) brisk walking, climbing, mainly outdoor activity, that increases the heart rate substantially and cause heavy sweating.

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Table 1
Description of errors made on paper and web versions of the Lifetime Physical Activity Questionnaire

Description of Error	Errors made on paper forms (total n=160)			Errors made on web forms (total n=69)		
	Number of participants who made the error* (% of total who completed this form)	Number of errors made	Mean number of errors made by type per person	Number of participants who made the error* (% of total who completed this form)	Number of errors made	Mean number of errors made by type per person
Inconsistent data reported for past year and current age epoch	106 (66.3%)	277	2.6	42 (60.9%)	105	2.5
Missing information	67 (41.9%)	331	4.9	20 (29%)	64	3.2
Reported more years than allowed by epoch	62 (38.8%)	276	4.5	34 (49.3%)	208	6.1
Incorrect information	46 (28.8%)	129	2.8	10 (14.5%)	23	2.3
Questionable number (too high or too low hours, months, years)	26 (16.3%)	94	3.6	11 (15.9%)	38	3.5
Other †	24 (15%)	65	2.7	17 (24.6%)	22	1.3
Mistakenly checked an activity that was not performed	20 (12.5%)	69	3.5	10 (14.5%)	19	1.9
Overlap with occupational questionnaire	12 (7.5%)	34	2.8	5 (7.2%)	13	2.6
No data reported for an entire page	5 (3.1%)	5	1	0 (0%)	0	0.0
Impossible number of years or months reported	3 (1.9%)	9	3.0	0 (0%)	0	0.0
Reported data in the wrong row	0 (0%)	0	0.0	0 (0%)	0	0.0
Errors that only occurred on paper forms						
Range/ non-single number reported	28 (17.5%)	212	7.6			
Unclear handwriting	13 (8.1%)	17	1.3			
Text answer when number was requested	7 (4.4%)	37	5.3			

* Participants could make more than one type of error

Other describes participants who made errors that were not included in the anticipated errors.[†]

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Table 2

Description of errors made on paper and web versions of the Occupational Questionnaire

Description of Error	Errors made on paper forms (total n=115)			Errors made on web forms (total n=40)		
	Number of participants who made the error* (% of total who completed this form)	Number of errors made	Mean number of errors made by type per person	Number of participants who made the error* (% of total who completed this form)	Number of errors made	Mean number of errors made by type per person
Intensity failed to describe multiple aspects of reported occupation	39 (33.9%)	67	1.7	13 (32.5%)	18	1.4
Other [†]	31 (27%)	95	3.1	12 (30%)	23	1.9
Incorrect information	21 (18.3%)	38	1.8	13 (32.5%)	17	1.3
Missing information	20 (17.4%)	53	2.7	4 (10%)	5	1.3
Non-occupational activity	17 (14.8%)	31	1.8	4 (10%)	6	1.5
Questionable hours, days, months or years reported	3 (2.6%)	3	1.0	1 (2.5%)	2	2.0
Questionable intensity reported	2 (1.7%)	4	2.0	1 (2.5%)	1	1.0
Overlap with LPAQ	1 (0.8%)	1	1.0	4 (10%)	6	1.5
Errors that only occurred on paper forms						
Range/ non-single number reported	46 (40%)	121	2.6			
Text answer when number was requested	5 (4.3%)	5	1.0			
Unclear handwriting	2 (1.7%)	3	1.5			

* Participants could make more than one type of error

[†] Other describes participants who made errors that were not included in the anticipated errors.