PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (see an example) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

TITLE (PROVISIONAL)	'Objectively measured sedentary time and physical activity in women with fibromyalgia; A cross-sectional study'
AUTHORS	Ruiz, Jonatan; Segura-Jiménez, Victor; Ortega, Francisco; Alvarez, Inmaculada; Camiletti, Daniel; Aparicio, Virginia; Carbonell-Baeza, Ana; Femia, Pedro; Munguia-Izquierdo, Diego; Delgado-Fernández, Manuel

VERSION 1 - REVIEW

REVIEWER	Patrick Bergman; RPT (MSc), PhD, Senior Lecturer Linneaus University Department of sport sciences Sweden
REVIEW RETURNED	15-Feb-2013

THE STUDY	1) Is the overall study design appropriate and adequate to answer the research question? The study design used in this study is my biggest concern regarding this study. The authors are investigating the amount and pattern of physical activity and sedentery behaviour among a group av patient with fibromyalgia using a cross-sectional study design. However, given that there is a lack of a (matched) control group the data is difficult to put into perspective. Especially since the patients are, contrary to intuition, appearing to be more active compared to nationally representative data from for example Sweden and the USA. A control group would significantly enhance the understanding of the outcome if this study. 2) Are the methods adequately described? Even if it may be a minor issue, it is not clear to me if the daily mean of physical activity at different intensities is used in analysis or some other measure such as the individual days. 3) Are the statistical methods described and are they appropriate. This is my second major issue of a scientific nature that I find in this article. The statistical methods could be appropriate but they are not described as thorough as one wants thus I find it difficult to assess if they are. Firstly, the number of predictors in the different regression models are perhaps too many resulting in a low power. Given that the rule of thumb says that around 10-15 observations are needed for every predictor inserted in the model are needed for having adequate power and that the maximum n=94 in this study there may cause a potential concern. There is also not clear to me how many subjects that were used in the analysis. Secondly, many of the predictors inserted in the models are

	basically different measures of the same thing. Body Mass Index, waist circumference and body fay (%) are all trying to estimate the body composition. Thus they are also likely to be highly correlated and when entered into a regression model they may cause collinearity with untrustworthy betas as one consequence (for example change of signs) and also causing the relative importance between the predictors becomes difficult to interpret. Have the variation inflation factor or tolerance statistics been analysed? Thirdly, I lack an overall measure of model fit, such as r-square for the linear models or some pseudo r-square (Nagelkerke) for the logistic models. In summary, I lack a thorough description of the model diagnostics such as the collinearity statistics and the total number of observations entered in the models already mentioned above, but also normality and homoscedasticity of residuals (the transformed dependent variablers suggests that they were unsatisfactorily, but no definitive answer is given). I also lack a complete presentation of the linear and logistic regression models with information of the betas and/or model fit. The presentations are also sometimes a bit reduntant with both p-values as well as confidence intervals. I suggest to use only confidence intervals since they are more informative.
GENERAL COMMENTS	I have read your paper with interest and much appreciation. I must applaud the introduction of objective measures into clinical practice, which I would like to see to a greater extent than what is done today.

REVIEWER	Failde, Immaculada Public Health Prof. Public Health Department University of Cadiz. Spain
REVIEW RETURNED	27-Feb-2013

THE STUDY	In the Method, the authors explain that a total of 116 patients who were members of the local Association of FM were included. However, no information is provided regarding the total number of female members or the study's response rate. The limitation should be added regarding the possible selection bias due to the specific characteristics of the sample and how this could have affected the results obtained. Furthermore, the study identifies whether the patients "have other severe somatic or psychiatric disorder" by means of the response in the PAR-Q. Given the importance of knowing about comorbidity, which is common among these patients, it would have been desirable to have followed this up with a direct clinical evaluation of the patients, or by using the information in the patients' clinical records. The authors could have included information about regular physical activity prior to the study, which would have provided information regarding the reliability of the results obtained.
RESULTS & CONCLUSIONS	Of note in the Results is the missing information about variables such as age or FIQ. In addition, the authors use a significant part of this section to describe inconclusive results, which also appear in Table 3. Table 3 should include both the crude and the adjusted OR. A better explanation should be given of the results obtained in the analysis of the variables associated with sedentary time and physical activity from the linear regression models used.

GENERAL COMMENTS	In this study the authors set out to characterize levels of objectively measured sedentary time and physical activity in a sample of women with fibromyalgia, and also provide estimates of the adherence to recommended level of healthy physical activity. The aim of the study is clear and well formulated, and the authors use a suitable design to achieve it. Both the population and the sources of information are well-described, with a detailed definition of the assessment tools used in the study. The statistical analysis is adequate. However, several recommendations can be made that the authors should take into consideration. In the Method, the authors explain that a total of 116 patients who were members of the local Association of FM were included. However, no information is provided regarding the total number of female members or the study's response rate. The limitation should be added regarding the possible selection bias due to the specific characteristics of the sample and how this could have affected the results obtained. Furthermore, the study identifies whether the patients "*have other severe somatic or psychiatric disorder*" by means of the response in the PAR-Q. Given the importance of knowing about comorbidity, which is common among these patients, it would have been desirable to have followed this up with a direct clinical evaluation of the patients, or by using the information in the patients' clinical records. The authors could have included information about regular physical activity prior to the study, which would have provided information regarding the reliability of the results obtained. Of note in the Results is the missing information about variables such as age or FIQ. In addition, the authors use a significant part of this section to describe inconclusive results, which also appear in Table 3. Table 3 should include both the crude and the adjusted OR. A better explanation should be given of the results obtained in the analysis of the variables associated with sedentary time and physical activity from the linear regression models used.

REVIEWER	Sandra Webber PhD, MSc, BMR(PT)
	Assistant Professor, Department of Physical Therapy
	School of Medical Rehabilitation, Faculty of Medicine
	University of Manitoba
	Winnipeg, MB CANADA
	I have no competing interests.
REVIEW RETURNED	28-Feb-2013

THE STUDY	It is questionable whether the participants are representative of typical fibromyalgia patients. It seems unusual that these patients were substantially more active than the general American population.
RESULTS & CONCLUSIONS	Again - it would not be fair to say that the results are not credible. However, the relatively high proportion of fibromyalgia participants achieving the physical activity guidlines is an unusual and unexpected finding which raises questions about the generalizability of the findings.
GENERAL COMMENTS	This study used accelerometers to measure physical activity levels and sedentary time in women with fibromyalgia. This is a potentially interesting area of study because individuals with fibromyalgia often report significant difficulties related to fatigue and exacerbation of pain with movement. As well, there are few studies that have attempted to measure physical activity and sedentary time with objective measures such as activity monitors in this population. Somewhat surprisingly, the authors found that >60% of the women in their study met the physical activity guidelines of the WHO and US Dept of Health (minimum of 30 minutes of moderate-to-vigorous activity for at least 5 days/week). As acknowledged by the authors, other studies of the general population have demonstrated lower levels of individuals meeting physical activity guidelines (e.g., 48% women in Sweden, <5% American women). This apparent discrepancy (attributed to cultural and methodological procedures) needs to be discussed in more detail in the manuscript. Is it possible that the participants in this study were not representative of typical patients with fibromyalgia if they are actually more active than the general population? In addition, no significant differences in activity levels/sedentary behaviour were found related to demographic factors or severity of the disease process etc. The significance of this finding should be discussed in more detail. Although this manuscript is generally clearly written, there are many instances of grammatical errors, improper verb tense and awkward sentence structure which should be addressed to improve the readability of the material. In the Introduction and in the Discussion, the authors make reference to studying physical activity patterns in women with fibromyalgia. However, it does not seem that patterns of activity have been assessed, rather just the number of minutes attained at different intensity levels (e.g., there is no analysis of when activity of different intensities tended to occur during the day). This should be clarified. The rationale for determination of the sample size is not given. The authors have used specific "standardized" cut-points to categorize moderate and moderate-to-vigorous physical activity in their participants. However, the references cited for these cut-points appear to be based on different activity monitor devices (ActiGraph MTI, CSA monitor). It is not clear exactly why these cut-points were chosen as there are various recommended for use with the ActiGraph GT1M device (Freedson et al 1998, Matthew 2005,

Troiano et al 2008, Swartz 2000). In the Discussion section (page 18) the authors acknowledge that cut-points may be most appropriate if they are developed for specific populations, however, this limitation is not specifically discussed in the manuscript.

It does not appear that the results of the linear regression analyses are presented in the results.

How do the findings related to sedentary time compare to other literature, perhaps in other patient groups or the general population?

Specific Comments

Article Summary – Article Focus: consider wording change to "To characterize the levels of objectively measured sedentary time and physical activity (using accelerometry) in women with fibromyalgia"

Article Summary – Key Messages: the use of "on average" is not necessary (understood that means will be presented for data), should MVPA be spelled out for the reader on first use?

Article Summary – Strengths and limitations: it is not clear exactly what is meant by "strict standardization of the fieldwork" (this also appear in Discussion page 18), perhaps the intention was for the last sentence on page 2 to say "all non-probability samples"?, it is not clear what is meant by load-bearing activities (page 3) – does this refer to walking or walking and carrying something in the arms?

Abstract – the use of the term "at least moderate intensity physical activity" (throughout the manuscript) seems awkward. Would it be accurate to say moderate-to-vigorous intensity physical activity?

Introduction – paragraph 3: do the authors have a reference to support their claim that physical activities are difficult to recall, quantify and categorize and any references to support idea that accelerometers are method of choice for measuring physical activity (what about pedometers?), paragraph 4: references cited later in paper (#27,28) should be used for last sentence in this paragraph (physical activity guidelines).

Methods: Participants - Did the inclusion criteria specify women? If so, it is not necessary to list 6 men as not being included in the study. Would it be more accurate to state that 110 women participated in the study but data from 16 were not included in analyses (n=5 incomplete accelerometry data, n=11 technical difficulties with devices)?

Methods: Measurements – were women interviewed in the "Association of Fibroyalgia" Building/Facility/meeting place? What is the significance of mentioning the Association of Fibromyalgia?, it would be helpful to the reader if a few more details about the accelerometers were provided (e.g, size, weight, uniaxial?, how many were deployed in this study, was any pre-calibration required?), why was the device worn over the lower back – is it not usually recommended that these devices be worn over the anterior or mid axillary line at the waist level?, is the MAHUffe program custom software? The website listed takes you to the MRC epidemiology site but not to this software.

Methods: Measurements (page 9) – references to definitions for periods of non-wear time, counts assumed to represent malfunctioning, cut-points (sedentary time) etc. need to be referenced. Was there any allowance for any minutes with counts between 0-100 in the non-wear periods?

Methods: Measurements (page 9) – reporting "average physical activity" is not standard, did the authors consider reporting time in light, moderate, vigorous activity per day? Average physical activity may not be very representative. Were the same cut-points used for all ages and BMI levels? If so, limitations surrounding this practice should be included in the Discussion.

Methods: Measurements (page 9) – 4th last line should be ≥ 1952

not 1925?

Methods: Measurements (page 10) – how was waist circumference measured, with a standard tape measure?

Statistical analyses: Would it be more accurate to state that means were calculated and an ANCOVA was used to look for differences between different categorizations of the participants (i.e., means were not calculated using ANCOVA)? The 2nd sentence in this first paragraph (page 11) spans 9 lines (very long).

Results – some explanation should be provided as to why a second FIQ threshold was chosen (≥ 59). It appears that the CI is listed incorrectly (page 11, 2nd paragraph, line 5) for proportion of women meeting guidelines (55.9-65.3%)?

Results – page 13, the meaning of the last paragraph on this page is not clear. What model is being discussed? Are the results of the linear regression presented anywhere?

Discussion – some suggestions for the Discussion have been provided in the General Comments section, paragraph 2 (page 14) includes a number of limitations of the study – these should be compiled and presented together later on in the Discussion (e.g., page 17), page 15 – what is the definition of "lifestyle" physical activity?, page 15 – it is noted that time spent at moderate physical activity and MVPA was lower in those with greater BMI's, however, these findings were not statistically significant (trend)

Discussion (page 17) – line 6 states these findings are in agreement with other studies but only one study is cited.

Table 2 - % signs not needed throughout listing of CI's, (a) needs to appear in table somewhere

Table 3 – has * but listed as (a) below table

VERSION 1 – AUTHOR RESPONSE

Reviewer: Patrick Bergman; RPT (MSc), PhD, Senior Lecturer
Linneaus University
Department of sport sciences
Sweden

Comment

1) Is the overall study design appropriate and adequate to answer the research question?

The study design used in this study is my biggest concern regarding this study. The authors are investigating the amount and pattern of physical activity and sedentery behaviour among a group av patient with fibromyalgia using a cross-sectional study design. However, given that there is a lack of a (matched) control group the data is difficult to put into perspective. Especially since the patients are, contrary to intuition, appearing to be more active compared to nationally representative data from for example Sweden and the USA. A control group would significantly enhance the understanding of the outcome if this study.

Answer

We do agree with the reviewer's comment that a healthy 'control' group would have been desirable in order to directly compare data from fibromyalgia women with those of aged- and culturally-matched healthy women. Unfortunately, information from aged- and culturally-matched healthy women is not available. We have highlighted this aspect in the limitation section.

Comment

2) Are the methods adequately described?

Even if it may be a minor issue, it is not clear to me if the daily mean of physical activity at different intensities is used in analysis or some other measure such as the individual days.

Answer

Analyses were made using daily mean physical activity at different intensities. This section has been re-written.

Comment
3) Are the statistical methods described and are they appropriate.
This is my second major issue of a scientific nature that I find in this article. The statistical methods could be appropriate but they are not described as thorough as one wants thus I find it difficult to assess if they are.
Firstly, the number of predictors in the different regression models are perhaps too many resulting in a low power. Given that the rule of thumb says that around 10-15 observations are needed for every predictor inserted in the model are needed for having adequate power and that the maximum n=94 in this study there may cause a potential concern. There is also not clear to me how many subjects that were used in the analysis.
Secondly, many of the predictors inserted in the models are basically different measures of the same thing. Body Mass Index, waist circumference and body fay (%) are all trying to estimate the body composition. Thus they are also likely to be highly correlated and when entered into a regression model they may cause collinearity with untrustworthy betas as one consequence (for example change of signs) and also causing the relative importance between the predictors becomes difficult to interpret. Have the variation inflation factor or tolerance statistics been analysed?
Thirdly, I lack an overall measure of model fit, such as r-square for the linear models or some pseudo r-square (Nagelkerke) for the logistic models.
In summary, I lack a thorough description of the model diagnostics such as the collinearity statistics and the total number of observations entered in the models already mentioned above, but also normality and homoscedasticity of residuals (the transformed dependent variablers suggests that they were unsatisfactorily, but no definitive answer is given). I also lack a complete presentation of the linear and logistic regression models with information of the betas and/or model fit. The presentations are also sometimes a bit reduntant with both p-values as well as confidence intervals. I suggest to use only confidence intervals since they are more informative.
Answer
We do acknowledge the reviewer's comments. The statistical section has been re-written following the reviewer's comment. Despite it might be redundant, we have decided to keep both p-values as well as confidence intervals for a better clarity and understanding.

Dear Authors
I have read your paper with interest and much appreciation. I must applaud the introduction of objective measures into clinical practice, which I would like to see to a greater extent than what is done today.
Pb
Answer
Comments appreciated.

Reviewer: Failde I. Public Health Prof. Public Health Department University of Cadiz. Spain
Comment
In this study the authors set out to characterize levels of objectively measured sedentary time and physical activity in a sample of women with fibromyalgia, and also provide estimates of the adherence to recommended level of healthy physical activity.
The aim of the study is clear and well formulated, and the authors use a suitable design to achieve it. Both the population and the sources of information are well-described, with a detailed definition of the assessment tools used in the study. The statistical analysis is adequate. However, several recommendations can be made that the authors should take into consideration.
Answer

Comments appreciated.

Comment
In the Method, the authors explain that a total of 116 patients who were members of the local Association of FM were included. However, no information is provided regarding the total number of female members or the study's response rate. The limitation should be added regarding the possible selection bias due to the specific characteristics of the sample and how this could have affected the results obtained.
Answer
We acknowledge the reviewers comment. Information regarding the response rate has been included in the methods section as well as in the limitation section where we have also discussed the possible selection bias of this population sample.

Comment
Furthermore, the study identifies whether the patients "have other severe somatic or psychiatric disorder" by means of the response in the PAR-Q. Given the importance of knowing about comorbidity, which is common among these patients, it would have been desirable to have followed this up with a direct clinical evaluation of the patients, or by using the information in the patients' clinical records.
The authors could have included information about regular physical activity prior to the study, which would have provided information regarding the reliability of the results obtained.
Answer
We appreciate the reviewer's comment. All patients were indeed diagnosed with fibromyalgia by a rheumatologist. Nevertheless, we confirmed the rheumatologist diagnosis by examining if they met the American College of Rheumatology criteria, which were: widespread pain for more than 3 months, and pain with 4 kg/cm of pressure reported for 11 or more of 18 tender points. We collected information about regular physical activity prior to the study by questionnaire, but, as mentioned in the study, we do not trust on this information due to the fact that physical activities are difficult to recall, quantify and categorize, and it might be even more difficult in people with memory and cognitive difficulties such as fibromyalgia patients.

Comment
Of note in the Results is the missing information about variables such as age or FIQ. In addition, the authors use a significant part of this section to describe inconclusive results, which also appear in Table 3. Table 3 should include both the crude and the adjusted OR.
Answer
Information about age and FIQ is given in table 1. The results section has been clarified following the reviewer's comment. Table 3 shows crude OR. Results from the crude OR after including registered time differ in 1-2 decimals. After internal discussions and for simplicity and easier interpretation, we decided to present the crude OR. The information of the adjusted (for registered time) OR has been included in the results section.

Comment
A better explanation should be given of the results obtained in the analysis of the variables associated with sedentary time and physical activity from the linear regression models used.
Answer
Done.

Reviewer: Sandra Webber PhD, MSc, BMR(PT)
Assistant Professor, Department of Physical Therapy
School of Medical Rehabilitation, Faculty of Medicine
University of Manitoba

Winnipeg, MB CANADA

I have no competing interests.
Comment
It is questionable whether the participants are representative of typical fibromyalgia patients. It seems unusual that these patients were substantially more active than the general American population.
Answer
We do agree that the observed prevalence of meeting the recommendations in this population might be higher than expected. We are however confident on the data based on the fact that the methodological procedures followed to measure physical activity were rather strict.
As indicated in the manuscript, the differences observed between our population and the American population might be explained by both cultural and methodological procedures. Several methodological differences can be noted between our study and the American study: First, whereas in our study all women had 7 valid days with at least 10 hours of registered time during waking hours, in the American study, only 26% of the total sample (adolescent included) had 7 valid days. Of note is that the American study included participants with just with one or more valid days; second, while we did not include in the analysis the first day of recording to avoid any source of reactivity, the American study included all measured days.

Comment
Again - it would not be fair to say that the results are not credible. However, the relatively high proportion of fibromyalgia participants achieving the physical activity guidlines is an unusual and unexpected finding which raises questions about the generalizability of the findings.
Answer
We do agree on the reviewer's comment, and we have also concerns regarding the generalizability of the findings, especially due to the fact that the sample is of convenience, which includes the known limitations of all non-probability samples, including less representativeness and unknown levels of sampling error. This issue is stated in the limitations section.

General Comments
This study used accelerometers to measure physical activity levels and sedentary time in women with fibromyalgia. This is a potentially interesting area of study because individuals with fibromyalgia often report significant difficulties related to fatigue and exacerbation of pain with movement. As well, there are few studies that have attempted to measure physical activity and sedentary time with objective measures such as activity monitors in this population. Somewhat surprisingly, the authors found that >60% of the women in their study met the physical activity guidelines of the WHO and US Dept of Health (minimum of 30 minutes of moderate-to-vigorous activity for at least 5 days/week). As acknowledged by the authors, other studies of the general population have demonstrated lower levels of individuals meeting physical activity guidelines (e.g., 48% women in Sweden, <5% American women). This apparent discrepancy (attributed to cultural and methodological procedures) needs to be discussed in more detail in the manuscript. Is it possible that the participants in this study were not representative of typical patients with fibromyalgia if they are actually more active than the general population? In addition, no significant differences in activity levels/sedentary behaviour were found related to demographic factors or severity of the disease process etc. The significance of this finding should be discussed in more detail.
Answer
Comments appreciated. The apparent discrepancy, especially with the American study has been included in the revised version of the discussion section. Moreover, we have included in the discussion section the potential selection bias of this population.

Comment
Although this manuscript is generally clearly written, there are many instances of grammatical errors,

improper verb tense and awkward sentence structure which should be addressed to improve the readability of the material.
Answer
We do apologize. The paper has been carefully revised.

Comment
In the Introduction and in the Discussion, the authors make reference to studying physical activity patterns in women with fibromyalgia. However, it does not seem that patterns of activity have been assessed, rather just the number of minutes attained at different intensity levels (e.g., there is no analysis of when activity of different intensities tended to occur during the day). This should be clarified.
Answer
We do agree. The term 'pattern' has been deleted.

Comment
The rationale for determination of the sample size is not given.
The authors have used specific "standardized" cut-points to categorize moderate and moderate-to-vigorous physical activity in their participants. However, the references cited for these cut-points appear to be based on different activity monitor devices (ActiGraph MTI, CSA monitor). It is not clear exactly why these cut-points were chosen as there are various recommended for use with the ActiGraph GT1M device (Freedson et al 1998, Matthew 2005, Troiano et al 2008, Swartz 2000). In the Discussion section (page 18) the authors acknowledge that cut-points may be most appropriate if they are developed for specific populations, however, this limitation is not specifically discussed in the manuscript.
Answer
The study population was of convenience. We have also added information regarding the response rate.
Following the reviewer's comment, we have expanded the limitation section by adding information regarding the cut-off points used and the potential limitation of using the same cut-offs for people with different BMI levels and age.

Comment
It does not appear that the results of the linear regression analyses are presented in the results.
Answer
The results of the linear regression analyses as presented in table 1. Only the betas from significant associations are presented in the results section. This has been clarified.

Comment
How do the findings related to sedentary time compare to other literature, perhaps in other patient groups or the general population?
Answer
Following the reviewer's comment, we have included information about sedentary estimates from other countries and compared them with those observed in our study.

Specific Comments
Article Summary – Article Focus: consider wording change to "To characterize the levels of objectively measured sedentary time and physical activity (using accelerometry) in women with fibromyalgia"
Answer
Done. Thanks for the suggestion.

Comment
Article Summary – Key Messages: the use of "on average" is not necessary (understood that means

will be presented for data), should MVPA be spelled out for the reader on first use?
Answer
Done.

Comment
Article Summary – Strengths and limitations: it is not clear exactly what is meant by "strict standardization of the fieldwork" (this also appear in Discussion page 18), perhaps the intention was for the last sentence on page 2 to say "all non-probability samples"?, it is not clear what is meant by load-bearing activities (page 3) – does this refer to walking or walking and carrying something in the arms?
Answer
The article summary section has been modified following the reviewer's suggestions.

Comment
Abstract – the use of the term "at least moderate intensity physical activity" (throughout the manuscript) seems awkward. Would it be accurate to say moderate-to-vigorous intensity physical activity?
Answer
We do agree with the reviewer's comment. The term "at least moderate intensity physical activity" has been changed by MVPA throughout the manuscript.

Comment
Introduction – paragraph 3: do the authors have a reference to support their claim that physical activities are difficult to recall, quantify and categorize and any references to support idea that accelerometers are method of choice for measuring physical activity (what about pedometers?), paragraph 4: references cited later in paper (#27,28) should be used for last sentence in this paragraph (physical activity guidelines).
Answer
We have added key references following the reviewer's comment.

Comment
Methods: Participants - Did the inclusion criteria specify women? If so, it is not necessary to list 6 men as not being included in the study. Would it be more accurate to state that 110 women participated in the study but data from 16 were not included in analyses (n=5 incomplete accelerometry data, n=11 technical difficulties with devices)?
Answer
The inclusion criteria did not specify women. We sent a formal invitation to participate in the study to all members (n=400) of a Local Association of Fibromyalgia (Granada, Spain), yet only 6 men responded.

Comment
Methods: Measurements – were women interviewed in the "Association of Fibroyalgia" Building/Facility/meeting place? What is the significance of mentioning the Association of Fibromyalgia?, it would be helpful to the reader if a few more details about the accelerometers were provided (e.g, size, weight, uniaxial?, how many were deployed in this study, was any pre-calibration required?), why was the device worn over the lower back – is it not usually recommended that these devices be worn over the anterior or mid axillary line at the waist level?, is the MAHUffe program custom software? The website listed takes you to the MRC epidemiology site but not to this software.
Answer
Women were interviewed in the Association of Fibromyalgia. We believe it is important to mention it due to the fact that the study population was obtained from that Association. As mentioned in the text, it was a convenience sample.

We have not provided more details about the accelerometer since it is a rather well known device. The device was worn on the lower back. Nevertheless, the placement of the monitor does not influence on the interpretation of the data1.

The MAHUFFE program is a custom software freely available. The website has been updated. http://www.mrc-epid.cam.ac.uk/Research/Programmes/Programme_5/InDepth/Programme%205_Downloads.html

Comment
Methods: Measurements (page 9) – references to definitions for periods of non-wear time, counts assumed to represent malfunctioning, cut-points (sedentary time) etc. need to be referenced. Was there any allowance for any minutes with counts between 0-100 in the non-wear periods?
Answer
Done, a reference has been added.
There was no allowance for any minute for counts between 0-100 in the non-wear periods. This information has been included in the manuscript.

Comment
Methods: Measurements (page 9) – reporting "average physical activity" is not standard, did the authors consider reporting time in light, moderate, vigorous activity per day? Average physical activity may not be very representative. Were the same cut-points used for all ages and BMI levels? If so, limitations surrounding this practice should be included in the Discussion.
Answer
Average-intensity physical activity refers to overall or total physical activity. We have changed terminology despite we believe the term "average" has extensively been used in the literature 2.
We used the same cut-points for all ages and BMI levels as suggested in previous studies 29. Use of a single cut point for all ages and BMI levels may however lead to an underestimate of moderate-intensity activity for the older and heavier group by not accounting for the decline in exercise capacity with age and weight. Following the reviewer's comment, this information has been included in the limitations section.

Comment
Methods: Measurements (page 9) – 4th last line should be ≥ 1952 not 1925?
Answer
Thanks for catching this. It has been modified.

Comment
Methods: Measurements (page 10) – how was waist circumference measured, with a standard tape measure?
Answer
Details on waist circumference measurement have been included.

Comment
Statistical analyses: Would it be more accurate to state that means were calculated and an ANCOVA was used to look for differences between different categorizations of the participants (i.e., means were not calculated using ANCOVA)? The 2nd sentence in this first paragraph (page 11) spans 9 lines (very long).
Answer
Changes have been done in the text following the reviewer's comment.

Comment
Results – some explanation should be provided as to why a second FIQ threshold was chosen (≥ 59). It appears that the CI is listed incorrectly (page 11, 2nd paragraph, line 5) for proportion of women

meeting guidelines (55.9-65.3%)?
Answer
The aim of including a second threshold was to test whether the observed findings were influenced by the FIQ threshold used. Therefore, we repeated the analysis by using a more recent FIQ threshold suggested by Bennet et al.33.
The CI has been modified. We do apologize for the typo.

Comment
Results – page 13, the meaning of the last paragraph on this page is not clear. What model is being discussed? Are the results of the linear regression presented anywhere?
Answer
The last paragraph has been deleted because it information was redundant.
The P for trend values of the linear regression are presented in table 1. Beta coefficients are only presented in the results section when P was statistically significant. This has been clarified in the text.

Comment
Discussion – some suggestions for the Discussion have been provided in the General Comments section, paragraph 2 (page 14) includes a number of limitations of the study – these should be compiled and presented together later on in the Discussion (e.g., page 17), page 15 – what is the definition of "lifestyle" physical activity?, page 15 – it is noted that time spent at moderate physical activity and MVPA was lower in those with greater BMI's, however, these findings were not statistically significant (trend)
Answer
The discussion section has been modified following the reviewer's comment. Limitations of the study have been compiled and are now presented together in the last part of the discussion section as recommended.
Lifestyle refers to moderate-intensity physical activity. It has been changed for easier understanding. We do also agree on that time spent at moderate-intensity physical activity and MVPA were lower and that findings were not statistically significant. We have slightly modified the sentence and indicated that the differences tended to be lower.

Comment
Discussion (page 17) – line 6 states these findings are in agreement with other studies but only one study is cited.
Answer
The sentence has been modified.

Comment
Table 2 - % signs not needed throughout listing of CI's, (a) needs to appear in table somewhere
Answer
We do agree with the reviewer's comment. % signs have been deleted from the table.

Comment
Table 3 – has * but listed as (a) below table
Answer
Thanks for catching this. It has been modified.

References

1. Yngve A, Nilsson A, Sjostrom M, Ekelund U. Effect of monitor placement and of activity setting on the MTI accelerometer output. Med Sci Sports Exerc 2003;35(2):320-6.

2. Hagstromer M, Oja P, Sjostrom M. Physical activity and inactivity in an adult population assessed by accelerometry. Med Sci Sports Exerc 2007;39(9):1502-8.

VERSION 2 – REVIEW

REVIEWER	Failde Immaculada Public Health Prof. Public Health Department. University of Cádiz. Spain I have no competing interests
REVIEW RETURNED	08-Apr-2013

THE STUDY	There is an important selection bias in the study but is difficult to control

REVIEWER	Sandra Webber PhD, MSc, BMR(PT) Assistant Professor, Department of Physical Therapy School of Medical Rehabilitation, Faculty of Medicine University of Manitoba Winnipeg, MB, Canada
REVIEW RETURNED	02-Apr-2013

THE STUDY	As noted by myself and another reviewer, these patients seem to be much more physically active than the general population which is surprising in individuals with FM. There is not control group for comparison in this study.
GENERAL COMMENTS	The authors have addressed many of the concerns expressed by the reviewers. However, I still have a few points for clarification. 1. The authors have changed the name of their primary outcome variable from "average intensity/ average physical activity" to "total physical activity" (e.g., in the abstract, and in methods page 9). This does not seem appropriate as the measure is mean counts/minute and it does not reflect the sum of activity counts for the day. "Average physical activity intensity" better describes the units of cpm, although reporting minutes of sedentary, light, moderate, and MVPA (similar to what is included in Table 4) is more descriptive and comparable to what is commonly reported in other studies. 2. The authors have added to the Discussion (page 16, 17) in response to some of the reviewers' comments about the relatively high levels of MVPA measured in these participants with fibromyalgia. They compare their results to findings in Troiano et al's study of 2003-2004 NHANES data and state that discrepancies may be related to the fact that the American study included individuals with only one valid day of accelerometry data. While it is true that this is a difference between the studies, there have been other studies published using NHANES 2005-2006 data (Tucker et al, Am J Prev Med, 2011) and Canadian data (Colley et al, Health Rep, 2011) that only included participants with at least 4 valid days of accelerometry data which also showed substantially lower levels of individuals meeting physical activity recommendations compared that results in this study of individuals with fibromyalgia. 3. While the authors acknowledge that using a single activity count cut-point has its limitations (page 18) they also state that they "used the same cut-points for all ages and BMI levels as suggested elsewhere (Hagstromer et al 2007)." This wording is too strong when Hagstromer et al acknowledge in their paper that no single cut-point

| | is ideal. It would be appropriate for the authors to state that they used a single cut-point as has been done by previous researchers (and provide relevant references), but they also need to acknowledge that this practice has its limitations. |
| | 4. Page 17, line 47 the authors have replaced "studies" with "other study", however the grammar needs to be fixed up here. |

VERSION 2 – AUTHOR RESPONSE

Reviewer: Sandra Webber PhD, MSc, BMR(PT)
Assistant Professor, Department of Physical Therapy
School of Medical Rehabilitation, Faculty of Medicine
University of Manitoba
Winnipeg, MB, Canada
No competing interests.

As noted by myself and another reviewer, these patients seem to be much more physically active than the general population which is surprising in individuals with FM. There is not control group for comparison in this study.
Answer
We do agree with the reviewer's comment. This issue was acknowledged in the manuscript in the previous version.

Comment
The authors have addressed many of the concerns expressed by the reviewers. However, I still have a few points for clarification.
1. The authors have changed the name of their primary outcome variable from "average intensity/ average physical activity" to "total physical activity" (e.g., in the abstract, and in methods page 9). This does not seem appropriate as the measure is mean counts/minute and it does not reflect the sum of activity counts for the day. "Average physical activity intensity" better describes the units of cpm, although reporting minutes of sedentary, light, moderate, and MVPA (similar to what is included in Table 4) is more descriptive and comparable to what is commonly reported in other studies.
Answer
We do fully agree with the reviewer. We have changed the term.

Comment
2. The authors have added to the Discussion (page 16, 17) in response to some of the reviewers' comments about the relatively high levels of MVPA measured in these participants with fibromyalgia. They compare their results to findings in Troiano et al's study of 2003-2004 NHANES data and state that discrepancies may be related to the fact that the American study included individuals with only one valid day of accelerometry data. While it is true that this is a difference between the studies, there have been other studies published using NHANES 2005-2006 data (Tucker et al, Am J Prev Med, 2011) and Canadian data (Colley et al, Health Rep, 2011) that only included participants with at least 4 valid days of accelerometry data which also showed substantially lower levels of individuals meeting physical activity recommendations compared that results in this study of individuals with fibromyalgia.
Answer
The studies mentioned by the Reviewer have been incorporated in the discussion section.

Comment
3. While the authors acknowledge that using a single activity count cut-point has its limitations (page 18) they also state that they "used the same cut-points for all ages and BMI levels as suggested elsewhere (Hagstromer et al 2007)." This wording is too strong when Hagstromer et al acknowledge in their paper that no single cut-point is ideal. It would be appropriate for the authors to state that they

used a single cut-point as has been done by previous researchers (and provide relevant references), but they also need to acknowledge that this practice has its limitations.
Answer
We acknowledge the Reviewer's comments and have incorporated them in the revised version of the manuscript. See page 18.

Comment
4. Page 17, line 47 the authors have replaced "studies" with "other study", however the grammar needs to be fixed up here.
Answer
Done.

Reviewer(s)' Comments to Author:

Reviewer: Failde I
Public Health Prof. Public Health Department. University of Cádiz. Spain

I have no competing interests

There is an important selection bias in the study but is difficult to control
Answer
We do acknowledge that there might be a selection bias. We cannot discard that women who accepted to participate in this study are those who are more aware of the importance of having an active lifestyle, which may have influenced the results.