

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Incidence and Outcomes of Emergency self-harm among Adolescents: A Descriptive Epidemiological Study in Osaka City, Japan
AUTHORS	Matsuyama, Tasuku; Kitamura, Tetsuhisa; Kiyohara, Kosuke; Hayashida, Sumito; Nitta, Masahiko; Kawamura, Takashi; Iwami, Taku; Ohta, Bon

VERSION 1 - REVIEW

REVIEWER	Tadahiro Goto Department of Emergency Medicine, Massachusetts General Hospital, Boston, USA
REVIEW RETURNED	12-Feb-2016

GENERAL COMMENTS	I appreciate the opportunity to review this interesting manuscript. Dr. Matsuyama et al. has described the incidence and characteristics of self-harms in adolescents by using ambulance records. Although Japan has the highest suicide rate in the world in a developed nation, little is known about the characteristics of self-harm in adolescents. Identifying characteristics of self-harms in adolescents, who are at high risk of suicide, is an urgent issue. Focusing solely on suicide may discount the importance of the upstream events including self-harms, and thereby underestimate the true public health burden. Thus, this well-written article bridges the knowledge gaps in the current literature and provides a foundation for future research on the preventing strategies for self-harms in adolescents. Followings are minor comments: 1. The Line 90-92 may be confusing – multiple ED visits vs. multiple complaints (self-harms) in one case. I think that a lack of patient identifier precludes you from detecting multiple self-harms in an adolescent. If the Line 90-92 indicates “If two or more self-harms were confirmed in a case (e.g., both cutting skin and poisoning were confirmed simultaneously in a case), each self-harm was treated as an independent case”, please elaborate on that (also in abstract). 2. As you stated in the Limitations section, the study population was limited to those who were transported by ambulance. If there are any supporting studies with different population in Japan, the comparison with those literature will enhance your arguments in the Discussion section. 3. Line 207: “In this study” is redundant.
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	4. For the conjunctive in the Line 264, “thereby” may be appropriate, instead of “because”. 5. Table1 and Figure2: Please be consistent the decimal digits in “Call to contact with a patient by EMS” and “Call to hospital arrival”. Likewise, please revise the decimal digit in the title of Y axis in the Figure2. 6. Figure 2 A-C: Both the main text and Figure legends used “number of self-harms”. Please be consistent in the title of Y axis in Figure 2 A-C because the use of “number of adolescents” will cause a misunderstanding – it is not “number of adolescents”, but “cases”.
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REVIEWER	Sarah Rowe King's College London UK
REVIEW RETURNED	04-Apr-2016

GENERAL COMMENTS	This is an interesting piece of work with a valid rationale behind it (although this could be better articulated). However, there are some fundamental problems that need to be addressed; these are: - The aims and objective of the study are not clear and make it difficult to evaluate the rest of the paper. Are you looking at self-harm or suicide or both? These are very different things so they should be examined separately or you should just focus on self-harm. Either way, this needs to be clearer - Much of the results section seems irrelevant. There are several figures and a lot of description about the time of day, week and season in which self-harm has occurred but I don't understand it's relevance. Is this information to provide the reader with some insight as to busy times of the year in which services are more regularly used and staffing may need to be higher? If so, this needs to be introduced earlier on - provide a context for this information and cut down the amount of attention it receives in the results and discussion - The discussion section needs a lot of work. It's lacking depth, doesn't go into enough detail of the strengths and limitations and fails to relate the findings to clinical implications. ----- Specific issues that need to be addressed are: Abstract – The objective in the abstract isn't very clear, I think the authors could provide an introductory sentence to set the context and then clearly outline the aim of the research. The use of “self-harms” prevents fluency when reading the abstract/manuscript(ms). Authors could change that to “self-harm” and outline what they mean when they refer to it (poisoning, cutting etc.). The sentence referring to participants could be restructured to make it clearer. Change “p for trend” to $p=x$. The concluding sentence again could be made a little clearer and
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	they could use “≥” instead of “>=” here and throughout the ms. Strengths and Limitations – Perhaps offer some other strengths of the study (instead of repeating the conclusion from abstract) such as wider mental health implications for young people, insight into prevention strategies etc. Surely they want to portray more than one strength since they note that epidemiological studies in this cohort/country are rare. I get the gist of the limitation but it could be rephrased to make it clearer. Introduction - The introduction could do with fleshing out a little more (they have the word limit to do so). They could make their definition of “self-harms” more explicit and define what constitutes as “emergency self-harms” clearer e.g. compared to “non- emergency self-harms”, I see what they have done re. funnelling the intro but this study is about self-harm in adolescents not suicide so perhaps should start with that and then lead into why it is so important to address (SH is a strong predictor of suicide) and that would more clearly link with their objectives, and why this study is unique, needed etc. Some sentences would benefit from re-phrasing as although the content is sound it doesn’t read very well e.g. line 62, pg. 6, line 66, pg. 6 and line 71, pg. 6. Methods - Although they explain about the role of the fire department later in the ms, it was confusing at first read and the paragraph on the EMS system could be moved to appear earlier on if they want to set the context better. It’s stated that Osaka had 186 hospitals, of which 94 were equipped to treat patients with life-threatening emergencies but it’s unclear if all 94 hospitals participated in the study. Not sure if “enrolled” is the right term to use here. Certain sentences could benefit from being rephrased so they read more fluently e.g. lines 94-98, pg. 7. They also use the terms classifications and diagnosis interchangeably which may cause confusion. Line 106, pg. 8 – unclear and would benefit from rephrasing. Line 122, pg. 8 – “type of transported hospitals and departments” is a confusing phrase. The use of “Endpoints” is a little unusual. Perhaps aims/objectives would be a more mainstream term to stick to? Where did the outcome classifications come from? Why was the incident rate calculated from only the 2010 census data only, what about the 2012 data as this study reportedly collected data over two years? Results - Although reference to figure 2 is made, there are 3 figure 2’s; A, B and C – could be made clearer. Self-harm x time of day – why don’t authors note that incidence during 12am to 6am is the same as for 12pm-6pm? In the statistical analysis section under Methods winter is categorised as January to March (4Q) – line 144, pg. 9 but in the Results section winter is categorised as October to December (line 167 – 168, pg. 10). Although the mean age was 17.3 overall (is that for boys and girls?), the incident rate seems highest in 19 year olds – could be noted/discussed. Is the type of department meant to indicate severity – could this be explained? With reference to the “transported self-harm cases” to
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	various departments – are these departments only in critical care medical centres? The figures for patients not transported do not match (see line 180 and 185, pg. 11). Discussion - Sentences and paragraphs would benefit from restructuring and rephrasing to be made clearer and more concise e.g. lines 198-205, lines 207-208 and lines 211-213, pg. 12. It should be made clearer that there were only some outcomes that differed according to age and gender and that the same could be said for incidence of SH and these should be explicitly outlined. Line 206, pg. 12 – do they mean communities or countries? Line 208, pg. 12 could they elaborate on in what way this study replicated the WHO report and important differences if any? Line 209 – 213 – unclear as this study isn't discussed in the Intro; would use of a firearm be classified as "death by self-harm?" Line 214 – 215, pg. 13 – seems a little misplaced. I think the authors go on to make some good points in the discussion, but the phrasing and structuring make it hard to follow and in some instances it reads as if the remarks are assumptive and not adequately grounded in the data. Could the authors make their definition of "mild, moderate and severe cases" clearer? Line 232 – 233 is quite a statement to make and warrants further discussion. Why is the reference to puberty only relevant for girls, can authors elaborate on why this is a specific factor for girls and not boys? (boys go through puberty too!) The discussion section sometimes repeats results without actually discussing them, although the authors draw parallels to other study results, possible explanation for these results are not sufficiently discussed. In what way does this study provide fundamental information that can aid the development of interventions in difference settings to prevent SH/suicide – can the authors discuss any findings related to those who self-harmed and where death occurred? This is quite a strong assertion in the discussion section and it could benefit from being fleshed out. Conclusion – Can again be re-phrased as the same sentence is repeated three times in this ms, and can seem a little repetitive. Perhaps authors could discuss implications for adolescents, EMS services, prevention programmes, further avenues for research etc. Tables – some cells have the word reference in them instead of data? Figures 2A, 2B and 2C are unnecessary and could be summarised briefly in a paragraph in the results section
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VERSION 1 – AUTHOR RESPONSE

Response to Reviewer 1:

Reviewer Name: Tadahiro Goto

Institution and Country: Department of Emergency Medicine, Massachusetts General Hospital, Boston, USA

Competing Interests: None declared

I appreciate the opportunity to review this interesting manuscript. Dr. Matsuyama et al. has described the incidence and characteristics of self-harms in adolescents by using ambulance records. Although Japan has the highest suicide rate in the world in a developed nation, little is known about the characteristics of self-harm in adolescents. Identifying characteristics of self-harms in adolescents, who are at high risk of suicide, is an urgent issue. Focusing solely on suicide may discount the importance of the upstream events including self-harms, and thereby underestimate the true public health burden.

Thus, this well-written article bridges the knowledge gaps in the current literature and provides a foundation for future research on the preventing strategies for self-harms in adolescents.

Thank you for your thorough reviews and suggestions. Our responses to your queries follow.

Followings are minor comments:

1. The Line 90-92 may be confusing – multiple ED visits vs. multiple complaints (self-harms) in one case. I think that a lack of patient identifier precludes you from detecting multiple self-harms in an adolescent. If the Line 90-92 indicates “If two or more self-harms were confirmed in a case (e.g., both cutting skin and poisoning were confirmed simultaneously in a case), each self-harm was treated as an independent case”, please elaborate on that (also in abstract).

In line with the Reviewer’s suggestion, we revised the sentences in the Methods as follows (Page 8 Line 101); “If two or more self-harm events were confirmed from one adolescent (e.g., both cutting skin and poisoning were confirmed simultaneously from one adolescent), each self-harm event was treated as an independent case.”

2. As you stated in the Limitations section, the study population was limited to those who were transported by ambulance. If there are any supporting studies with different population in Japan, the comparison with those literature will enhance your arguments in the Discussion section.

It is difficult to estimate the number of walk-in patients with self-harm or patients who did not request emergency services, because there are no epidemiological studies on this topic in Japan. However, in the preceding study, it is suggested that the number of patients with self-harm who did not request emergency services would be about eight times as large as those who did. To clarify this, we revised the sentence in the Limitation as follows (Page 18 Line 288); “Second, our study included only emergency patients treated by EMS personnel, and we therefore have no information on walk-in patients with self-harm or those who did not request emergency services, although a previous study demonstrated that the number of patients with self-harm who did not request emergency services is about eight times as large as those who did.³⁰”

We cited the following paper in this sentence (Page 24 Line 425).

31. Madge N, Hewitt A, Hawton K, et al. Deliberate self-harm within an international community sample of young people: comparative findings from the Child & Adolescent Self-harm in Europe (CASE) Study. *J Child Psychol Psychiatry* 2008;49(6): 667-677.

3. Line 207: “In this study” is redundant.

In line with the Reviewer’s suggestion, we eliminated the terms “in this study (Page 8 Line 103).”

4. For the conjunctive in the Line 264, “thereby” may be appropriate, instead of “because”.

In line with the Reviewer’s suggestion, we changed the terms “because” to “thereby (Page 18 Line

293)."

5. Table1 and Figure2: Please be consistent the decimal digits in "Call to contact with a patient by EMS" and "Call to hospital arrival". Likewise, please revise the decimal digit in the title of Y axis in the Figure2.

We sincerely apologized for the careless mistake, and revised it.

6. Figure 2 A-C: Both the main text and Figure legends used "number of self-harms". Please be consistent in the title of Y axis in Figure 2 A-C because the use of "number of adolescents" will cause a misunderstanding – it is not "number of adolescents", but "cases".

As this Reviewer pointed out, we agree that the use of "number of adolescents" will cause a misunderstanding. Therefore, we changed the terms "Number of adolescents" to "Number of emergency self-harm cases." Please see Figure 2A-C.

Response to Reviewer 2:

Reviewer: 2

Reviewer Name: Sarah Rowe

Institution and Country: King's College London, UK

Competing Interests: None declared

This is an interesting piece of work with a valid rationale behind it (although this could be better articulated). However, there are some fundamental problems that need to be addressed; these are:

Thank you for your thorough reviews and suggestions. Our responses to your queries follow.

- The aims and objective of the study are not clear and make it difficult to evaluate the rest of the paper. Are you looking at self-harm or suicide or both? These are very different things so they should be examined separately or you should just focus on self-harm. Either way, this needs to be clearer

Our target is self-harm both with and without suicidal intention. Importantly, our descriptive epidemiological study was based on the ambulance records (not hospital- and/or interview-based), and data used in this study were uniformly collected via regular EMS forms. Therefore, this study could not find out the purpose/motivation of self-harm such as suicidal intention from these ambulance records, and we revised the sentence in the Limitation as follows (Page 18 Line 282); "First, the data used in this study were based on ambulance records by EMS personnel, and we did not obtain information on the purpose/motivation of self-harm such as suicidal intention."

- Much of the results section seems irrelevant. There are several figures and a lot of description about the time of day, week and season in which self-harm has occurred but I don't understand it's relevance. Is this information to provide the reader with some insight as to busy times of the year in which services are more regularly used and staffing may need to be higher? If so, this needs to be introduced earlier on - provide a context for this information and cut down the amount of attention it receives in the results and discussion

As mentioned above, our descriptive epidemiological study was based on the ambulance records (not hospital- and/or interview-based), and data used in this study were uniformly collected via regular EMS forms. The strength of this study is that to our knowledge, this is the first to assess EMS-related adolescent self-harm and provides important epidemiological information which may help prevent incidents of self-harm among adolescents in Asia, and no other such large-scale evaluations have been conducted using ambulance records in Asia. We believe that our manuscript showing the actual

situation of emergency adolescents with self-harm in prehospital settings would be a fundamental material that can lead to improving prehospital emergency cares for them, and emergency physicians would acknowledge the importance of our manuscript. Therefore, we consider that as a descriptive epidemiological study, it would be important to evaluate the distribution of sex, age, and temporal patterns of emergency self-harm among adolescents.

- The discussion section needs a lot of work. It's lacking depth, doesn't go into enough detail of the strengths and limitations and fails to relate the findings to clinical implications.

In line with the Editor's suggestion, we added the 3 bullet points in the Strengths and Limitations' section as follows (Page 5 Line 57); "To our knowledge, this is the first to assess EMS-related adolescent self-harm and provides important epidemiological information which may help prevent incidents of self-harm among adolescents in Asia", "No other such large-scale evaluations have been conducted using ambulance records in Asia." and "We did not obtain information on the purpose/motivation of self-harm such as suicidal intention." We also added these sentences in the Discussion (Page 15 Line 224, Page 15 Line 227, and Page 18 Line 282). In addition, we agreed to the Editor's and Reviewer 2's comments that there were a lot of unclear expressions in our manuscript. Therefore, we also asked an English language editing service to eliminate some grammatical errors and to conform to correct scientific sentences in whole Text, especially the Discussion.

Specific issues that need to be addressed are:

Abstract – The objective in the abstract isn't very clear, I think the authors could provide an introductory sentence to set the context and then clearly outline the aim of the research.

Again, our descriptive epidemiological study was to evaluate the incidence and outcomes of self-harm among emergency adolescents from ambulance records, and we already described in the Objectives of the Abstract (Page 3 Line 29).

- The use of "self-harms" prevents fluency when reading the abstract/manuscript (ms). Authors could change that to "self-harm" and outline what they mean when they refer to it (poisoning, cutting etc.).

In line with the Reviewer's suggestions, we changed "self-harms" to "self-harm" throughout the Text.

- The sentence referring to participants could be restructured to make it clearer.
Change "p for trend" to $p=x$.

Although we discussed the change within authors, we did not change the words "p for trend" in order to mention the use of the trend test in this analysis.

- The concluding sentence again could be made a little clearer and they could use " $\geq$ " instead of " $\geq$ " here and throughout the ms.

In line with the Reviewer's suggestions, we changed " $\geq$ " to " $\geq$ " throughout the Text.

- Strengths and Limitations – Perhaps offer some other strengths of the study (instead of repeating the conclusion from abstract) such as wider mental health implications for young people, insight into prevention strategies etc.

Surely they want to portray more than one strength since they note that epidemiological studies in this

cohort/country are rare.

I get the gist of the limitation but it could be rephrased to make it clearer.

Again, in line with the Reviewer's and Editor's suggestion, we added the 2 bullet points in the Strengths and Limitations' section as follows (Page 5 Line 57); "To our knowledge, this is the first to assess EMS-related adolescent self-harm and provides important epidemiological information which may help prevent incidents of self-harm among adolescents in Asia" and "No other such large-scale evaluations have been conducted using ambulance records in Asia." We also rephrased the limitations and added the sentence as follows (Page 5 Line 69); "We did not obtain information on the purpose/motivation of self-harm such as suicidal intention."

- Introduction

- The introduction could do with fleshing out a little more (they have the word limit to do so).

They could make their definition of "self-harms" more explicit and define what constitutes as "emergency self-harms" clearer e.g. compared to "non- emergency self-harms".

Some sentences would benefit from re-phrasing as although the content is sound it doesn't read very well e.g. line 62, pg. 6, line 66, pg. 6 and line 71, pg. 6.

We paraphrased and fleshed out a lot of sentences in the Introduction by an English language editing service. For example, we revised the sentences as follows; "While incidence of self-harm has been shown to be higher among adolescents than adults, rates of lifetime experience of self-harm vary by community, producing conflict findings (Page 6 Line 82)" and "Of note, most of reports on adolescent self-harm have collected data using interviews of theoretical sampling or from single-center medical records, but relatively few population-based studies have evaluated incidence of emergency self-harm and their outcomes treated by emergency medical service (EMS) personnel (Page 6 Line 87)"

- I see what they have done re. funnelling the intro but this study is about self-harm in adolescents not suicide so perhaps should start with that and then lead into why it is so important to address (SH is a strong predictor of suicide) and that would more clearly link with their objectives, and why this study is unique, needed etc.

Our target is self-harm both with and without suicidal intention treated by EMS personnel as described above. In the Introduction, we mentioned the overview of preceding studies on adolescent self-harm and the value of our descriptive study.

- Methods

- Not sure if "enrolled" is the right term to use here.

- Certain sentences could benefit from being rephrased so they read more fluently e.g. lines 94-98, pg. 7.

- They also use the terms classifications and diagnosis interchangeably which may cause confusion.

- Line 106, pg. 8 – unclear and would benefit from rephrasing.

- Line 122, pg. 8 – "type of transported hospitals and departments" is a confusing phrase.

- The use of "Endpoints" is a little unusual. Perhaps aims/objectives would be a more mainstream term to stick to?

Again, we paraphrased a lot of sentences in the Results by an English language editing service. For example, we revised the sentences and terms as follows; "All adolescents (aged 10-19 years) treated by EMS personnel for self-harm in Osaka City were included (Page 8 Line 99)", "destination hospital/department type (Page 9 Line 135)", and "Incidence and Outcomes (Page 10 Line 141)"

- Although they explain about the role of the fire department later in the ms, it was confusing at first read and the paragraph on the EMS system could be moved to appear earlier on if they want to set

the context better.

Although we discussed the order of sections in the Methods within authors, we believe that the current position of the section of “EMS system in Osaka city” is better for the structure of the Methods. Therefore, we did not change the order of the section in the Methods.

- It's stated that Osaka had 186 hospitals, of which 94 were equipped to treat patients with life-threatening emergencies but it's unclear if all 94 hospitals participated in the study.

Basically, all patients who requested emergency services were transported to one of these 184 hospitals. To clarify it, we added the sentence in the Methods as follows (Page 9 Line 127); “Basically, all patients who requested emergency services were transported to one of these 184 hospitals.”

- Where did the outcome classifications come from?

The outcome classifications were based on the regular forms categorized by the EMS in cooperation with physicians.

- Why was the incident rate calculated from only the 2010 census data only, what about the 2012 data as this study reportedly collected data over two years?

The most reliable national census was used as the denominator for the calculation of the incidence of self-harm as many other cohort studies in Japan used it.

- Results

We paraphrased a lot of sentences in the Results, Tables, and Figure. For example, we revised the sentence as follows (Page 12 Line 168); “The incidence of self-harm increased significantly between the ages of 11 and 19, from 6.3 to 81.0 among boys and the ages of 12 and 19 from 6.3 to 228.3 among girls, respectively.”

- Although reference to figure 2 is made, there are 3 figure 2's; A, B and C – could be made clearer.

In line with the Reviewer's suggestion, we added the sentence in the Results as follows (Page 12 Line 179) “The number was the same between the period of 0-6h and 12-18h (Figure 2A). Regarding influence of day of the week, the number did not markedly differ by day (Figure 2B). As for seasons, the number was 1.36-times (95% CI, 1.02-1.82) greater in spring: 1Q (Apr-Jun) than in winter: 4Q (Jan-Mar) (Figure 2C).”

- Self-harm x time of day – why don't authors note that incidence during 12am to 6am is the same as for 12pm-6pm?

In line with the Reviewer's suggestion, we added the sentence in the Results as follows (Page 12 Line 179); “The number was the same between the period of 0-6h and 12-18h”

- In the statistical analysis section under Methods winter is categorised as January to March (4Q) – line 144, pg. 9 but in the Results section winter is categorised as October to December (line 167 – 168, pg. 10).

We sincerely apologized for the careless mistake, and revised it (Page 12 Line 182).

- Although the mean age was 17.3 overall (is that for boys and girls?), the incident rate seems highest

in 19 year olds – could be noted/discussed.

This study focused on adolescents aged 10-19 years. In line with the Reviewer's suggestion, we added the sentence in the Results as follows; "The incidence was highest in 19 years old (Page 12 Line 170)." We already described in the Discussion that the incidence in this age group was increasing with age.

- Is the type of department meant to indicate severity – could this be explained? With reference to the "transported self-harm cases" to various departments – are these departments only in critical care medical centres?

These departments included not only in CCMC but also in non-CCMC, and type of department was not associated with the severity of self-harm.

- The figures for patients not transported do not match (see line 180 and 185, pg. 11).

A total of 82 non-transported patients consist of those with "30 refusal of transport by patients," "43 only prehospital treatments," or "9 death confirmed at the scene." However, since the sentence in the Results was obscure as the Reviewer pointed out, we revised the sentence as follows (Page 13 Line 196); "The number of non-transported patients including cases with refusal of transport by themselves, only prehospital treatments, or death confirmed at the scene was 82."

- Discussion

- Sentences and paragraphs would benefit from restructuring and rephrasing to be made clearer and more concise e.g. lines 198-205, lines 207-208 and lines 211-213, pg. 12.

- Line 214 – 215, pg. 13 – seems a little misplaced.

- I think the authors go on to make some good points in the discussion, but the phrasing and structuring make it hard to follow and in some instances it reads as if the remarks are assumptive and not adequately grounded in the data.

- Line 232 – 233 is quite a statement to make and warrants further discussion.

Thank you for your important comments. In line with the Reviewer's suggestions, we also paraphrased and fleshed out a lot of sentences in the Discussion, especially the first paragraph (Page 15 Line 218-229). For example, we revised the sentence as follows (Page 15 Line 234); "However, some discrepancies were noted in our present findings and those in other similar studies."

- The discussion section sometimes repeats results without actually discussing them, although the authors draw parallels to other study results, possible explanation for these results are not sufficiently discussed.

Repeatedly, our descriptive epidemiological study was based on the ambulance records (not hospital-and/or interview-based), and data used in this study were uniformly collected via regular EMS forms. Therefore, as a descriptive epidemiological study, our discussion focused mainly on the comparison with the study results in other communities and countries.

- It should be made clearer that there were only some outcomes that differed according to age and gender and that the same could be said for incidence of SH and these should be explicitly outlined.

In line with the Reviewer's suggestion, we revised the sentence about age- and gender-differences of adolescent self-harm in the Discussion as follows (Page 15 Line 221); "our findings also demonstrated the gender paradox that, whereas the incidence was higher among girls than boys, particularly in the group aged ≥ 15 years, the proportions of deaths were greater among boys than

among girls.”

- Line 206, pg. 12 – do they mean communities or countries?

“Communities and/or countries” were correct. We revised it (Page 15 Line 230).

- Line 208, pg. 12 could they elaborate on in what way this study replicated the WHO report and important differences if any?

Although there are wide variations in the rates of suicide and suicide attempts suicide by region, sex, age and method, WHO reported that for each adult who died of suicide there were likely to be 20 or more than others who made suicide attempts.¹

1. World Health Organization. Mental health: Suicide Prevention.
www.who.int/mental_health/suicide-prevention/en/ (accessed 30 May 2015)

- Line 209 – 213 – unclear as this study isn’t discussed in the Intro; would use of a firearm be classified as “death by self-harm?”

Firearms are strictly restricted in Japan, and there was no self-harm by firearms in this area. Therefore, we added the sentence in the Results as follows (Page 13 Line 191); “there was no self-harm by firearms in this area.”

- Could the authors make their definition of “mild, moderate and severe cases” clearer?

As the Reviewer pointed out, we did not define “mild, moderate and severe cases”, and we revised the sentence in the Discussion as follows (Page 16 Line 259); “while incidence of self-harm was higher in girls than in boys, self-harm by boys more often resulted in hospital admission or death.”

- Why is the reference to puberty only relevant for girls, can authors elaborate on why this is a specific factor for girls and not boys? (boys go through puberty too!)

Although boys also go through puberty, we consider that one of the reasons for gender differences in the incidence of self-harm may be female hormones. Hence, we add the sentence in the Discussion as follows (Page 16 Line 255); “Puberty of girls is another plausible reason for high incidence of self-harm.²² For example, puberty might cause lack of synchrony between age and cognitive development and be at risk of self-harm. Although boys also go through puberty, female hormones may lead to the increased prevalence of self-harm among girls.²³”

- In what way does this study provide fundamental information that can aid the development of interventions in difference settings to prevent SH/suicide – can the authors discuss any findings related to those who self-harmed and where death occurred? This is quite a strong assertion in the discussion section and it could benefit from being fleshed out.

In line with the Reviewer’s suggestions, we revised the sentence about the intervention/prevention for adolescent self-harm in the Discussion as follows (Page 17 Line 278); “Given the effectiveness of active and gender-specific interventions in preceding studies,^{26,29} comprehensive measures of self-harm prevention for adolescents, especially girls should be taken even in Japan as with the suicide prevention³⁰ in cooperation with various organizations.”

- Conclusion

- Can again be re-phrased as the same sentence is repeated three times in this ms, and can seem a

little repetitive. Perhaps authors could discuss implications for adolescents, EMS services, prevention programmes, further avenues for research etc.

In line with this Reviewer's suggestion, we revised the sentence in the Conclusion as follows (Page 18 Line 300); "It would be necessary to establish active, gender-specific, and comprehensive prevention strategies for adolescent self-harm, based on our findings showing the age-and gender-differences of self-harm among adolescents."

Tables – some cells have the word reference in them instead of data?

Figures 2A, 2B and 2C are unnecessary and could be summarised briefly in a paragraph in the results section

As mentioned above, we consider that as a descriptive epidemiological study, it is important to evaluate the distribution of temporal patterns of emergency self-harm among adolescents.

VERSION 2 – REVIEW

REVIEWER	Tadahiro Goto Massachusetts General Hospital, US
REVIEW RETURNED	04-May-2016

GENERAL COMMENTS	The authors have responded to all of my questions/concerns and adjusted the manuscript appropriately and accordingly. I appreciate their detailed, thorough, and organized response to each of my queries. I have no further comments.
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REVIEWER	Sarah Rowe King's College London
REVIEW RETURNED	24-May-2016

GENERAL COMMENTS	This reads much better and the authors have done a good job incorporating many of the reviewer's comments. Minor edits and clarification are still required before I would recommend accepting and publication. Specifically: - you have mentioned in your statistical analyses section that you are examining trend therefore it's unnecessary to write "p for trend". This is not consistent with the style of the journal or how you write it later on e.g. $p=0.016$ on pg 14, line 206 - on pg 9, line 124 you state that "Osaka City had 186 hospitals" but then on line 126 you say "Basically, all patients who requested emergency services were transported to one of these 184 hospitals". Are there 186 or 184 hospitals? Clarify/correct. Also, I would recommend dropping the word 'basically' from the sentence - you have not adequately explained their proposal about the impact of "female hormones" on SH – I've had a look at the reference you use and it has a number of limitations. Perhaps you should broaden that possible explanation for this? Consider O'Connor's 2009 paper in the BJP - The sentence about firearms (pg 15, line 236) should be rephrased
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	e.g. 'this is unlikely to be reported in Japan due to strict firearm regulations' - The link between psychiatric disorders and SH in adolescence needs further exploration – the references used doesn'tt say psychiatric disorders are the main cause of SH (pg 16, line 245). A range of factors have been identified as potential risk factors - The sentence about cognitive development and suicide (pg 16, line 248) doesn't make sense and needs further exploration - You have said that no other studies have evaluated temporal patterns but then go on to say that their findings are in line with other work?! (pg 17, line 263). Also you have not mentioned how this would specifically inform prevention strategies (which you imply throughout) - minor typos should be corrected during editing. Sentences should be checked to see that they make sense
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VERSION 2 – AUTHOR RESPONSE

Response to Reviewer 1:

Reviewer Name: Tadahiro Goto

Institution and Country: Department of Emergency Medicine, Massachusetts General Hospital, Boston, USA

Competing Interests: None declared

The authors have responded to all of my questions/concerns and adjusted the manuscript appropriately and accordingly. I appreciate their detailed, thorough, and organized response to each of my queries. I have no further comments.

Thank you for your thorough reviews.

Response to Reviewer 2:

Reviewer: 2

Reviewer Name: Sarah Rowe

Institution and Country: King's College London, UK

Competing Interests: None declared

This reads much better and the authors have done a good job incorporating many of the reviewer's comments. Minor edits and clarification are still required before I would recommend accepting and publication. Specifically:

Thank you for your thorough reviews and suggestions. Our responses to your queries follow.

- you have mentioned in your statistical analyses section that you are examining trend therefore it's unnecessary to write "p for trend". This is not consistent with the style of the journal or how you write it later on e.g. $p=0.016$ on pg 14, line 206

In line with the Reviewer's suggestion, we changed the terms of "P for trend" to "p" throughout the

manuscript.

- on pg 9, line 124 you state that “Osaka City had 186 hospitals” but then on line 126 you say “Basically, all patients who requested emergency services were transported to one of these 184 hospitals”. Are there 186 or 184 hospitals? Clarify/correct. Also, I would recommend dropping the word ‘basically’ from the sentence

We sincerely apologized for our careless mistake, and 186 hospitals were correct. We revised it (Page 9 Line 120). In addition, in line with the Reviewer’s suggestion, we deleted the word “basically” from the sentence.

- you have not adequately explained their proposal about the impact of “female hormones” on SH – I’ve had a look at the reference you use and it has a number of limitations. Perhaps you should broaden that possible explanation for this? Consider O’Connor’s 2009 paper in the BJP

As the Reviewer pointed out, we also consider that studies on female hormone have inherent limitations, but we believe that female hormones are also one of important factors explaining the gender difference in self-harm. However, in order to broaden our discussion, based on O’Connor’s 2009 paper in the BJP, we added the sentence in the Discussion as follows (Page 16 Line 240); “This shift in incidence with age may be due to a range of factors, such as increasing prevalence of psychiatric disorders, and development of cognitive function as well as lifestyle, life events and problems, and social influences. For example, O’Connor and colleagues demonstrated that smoking, drug use, bullying, physical abuse, sexual orientation worries, serious boy/girlfriend problems, and self-harm by friends or family were associated with self-harm as life style, life events and problems, and social influences.²¹” We cited O’Connor’s paper in this sentence (Reference 21).

- The sentence about firearms (pg 15, line 236) should be rephrased e.g. ‘this is unlikely to be reported in Japan due to strict firearm regulations’

In line with the Reviewer’s suggestion, we revised the sentence in the Discussion as follows (Page 15 Line 232); “this is unlikely to be reported in Japan due to strict firearm regulations”

- The link between psychiatric disorders and SH in adolescence needs further exploration – the references used doesn’t say psychiatric disorders are the main cause of SH (pg 16, line 245). A range of factors have been identified as potential risk factors

As the Reviewer pointed out, we also consider that various factors identified as potential risk factors including psychiatric disorders for adolescent self-harm are one of the important potential factors. Therefore, we revised the sentence in the Discussion as follows (Page 16 Line 245); “In particular, the prevalence of psychiatric disorders—one of important causes of self-harm—, dramatically increased during adolescence.” In addition, as described above, we added the sentence in the Discussion based on O’Connor’s paper.

- The sentence about cognitive development and suicide (pg 16, line 248) doesn’t make sense and needs further exploration

In line with the Reviewer’s suggestion, we deleted the sentence about cognitive development and suicide (Page 16 Line 245). Instead, based on O’Connor’s paper as mentioned above, we revised the sentence in the Discussion as follows (Page 16 Line 240); “This shift in incidence with age may be due to a range of factors, such as increasing prevalence of psychiatric disorders, and development of cognitive function as well as lifestyle, life events and problems, and social influences.”

- You have said that no other studies have evaluated temporal patterns but then go on to say that their findings are in line with other work?! (pg 17, line 263). Also you have not mentioned how this would specifically inform prevention strategies (which you imply throughout)

Reports cited in our paper evaluated temporal patterns of “adult” self-harm, and our expression was obscure as the Reviewer pointed out. Therefore, to clarify it, we added the terms of “on adult self-harm” in this sentence (Page 17 Line 266). In addition, to mention how this would specifically inform prevention strategies, we revised the sentence in the Discussion as follows (Page 17 Line 272); “Our findings could yield fundamental information on improving prevention strategies such as more careful monitoring of children with identified potential risk factors²¹ by parents or school staff based on these temporal patterns in order to reduce the incidence of adolescent self-harm.”

- minor typos should be corrected during editing. Sentences should be checked to see that they make sense

In line with the Reviewer’s suggestion, in order to correct our minor typos, we again checked the sentences and revised them throughout the manuscript. For example, we revised the sentence in the Introduction as follows (Page 6 Line 82); “Of note, most reports on adolescent self-harm have collected data using interviews of theoretical sampling or from single-center medical record.”