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Caregivers' knowledge about children's paracetamol

Judy Mullan
University of Wollongong, jmullan@uow.edu.au

Pippa Burns
University of Wollongong, pippa@uow.edu.au

Danielle Sargeant
University of Wollongong, dls134@uowmail.edu.au

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Caregivers’ knowledge about children’s paracetamol

Abstract
Although safe, paracetamol, commonly used in children, can cause adverse events if not administered correctly. This research aimed to investigate caregivers’ knowledge about children’s paracetamol. A convenience sample of caregivers who had purchased Children’s Panadol were asked to complete an online survey, assessing their knowledge of paracetamol. Most of the 174 respondents were female (93.7%), highly-educated (72.4%) with adequate functional health literacy (85.6%). Almost all respondents correctly identified that Children’s Panadol contained paracetamol (96.6%). However, approximately a quarter of them did not know the maximum daily dose (26.4%), just under half (46%) did not know how many days this dose could be safely given, and over one-third (37.4%) did not know that liver toxicity could result from overdose. These findings suggest that adult caregivers administering paracetamol to children have gaps in their knowledge. Strategies to help improve caregiver’s knowledge about the correct and safe administration of children’s paracetamol need to be considered.

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INTRODUCTION

Paracetamol, or acetaminophen, a medication commonly used to treat pain and fever, is readily available worldwide (1). Over-the-counter (OTC) liquid preparations of paracetamol are frequently used in children, especially among those aged up to two years (2). If given in accordance to dosage recommendations, paracetamol is safe and effective (3). However, if given in doses which exceed these recommendations, paracetamol can cause severe adverse effects (4). Notably, paracetamol is one of the most common agents of unintentional poisoning in young children (5–8), and is a major cause of paediatric acute liver failure (5,9).

Information about the safe administration of OTC paracetamol products can be obtained from health professionals; product packaging and information inserts. This study aimed to investigate if Australian adult caregivers have sufficient knowledge to correctly and safely administer paracetamol to children. The Children’s Panadol™ brand was specifically chosen because it is a well-known and commonly purchased brand.

Methods

Following human research ethics approval from the University of Wollongong (HE14/455), a cross-sectional online survey was administered via SurveyMonkey between September and October 2015. The survey included demographic questions (seven items including a health literacy question which was assessed using the single item literacy screener (10,11) and product knowledge questions required to safely and correctly administer children’s paracetamol (12 items based on information available on the product packaging)(Appendix 1). To be able to answer questions 12 and 13 of the survey, participants were provided with a copy of the dosage information provided on
the packaging of Children’s Panadol Elixir 5 -12 years.

A convenience sample of respondents was obtained using Facebook. A link to the online survey (Appendix 1) was posted via Facebook to all Facebook friends of the research team. This was then followed by a snowball sampling technique, whereby study participants recruited via Facebook were encouraged to share the link to the survey with their Facebook friends. A link to the survey was also included on three Australian online parenting forums, Raising Children (http://raisingchildren.net.au/), BubHub (http://www.bubhub.com.au/index.php) and Essential Baby (http://www.essentialbaby.com.au/).

Potential participants were informed that they needed to have purchased one of the following products: Children's Panadol® Baby Drops 1 month - 2 years; Children’s Panadol® Suspension 1 - 5 years; and/or Children’s Panadol® Elixir 5 – 12 years to be eligible to complete the survey.

Collected survey data were analysed using the Statistical Package for the Social Sciences (SPSS v.21).

RESULTS

Respondent demographics:

The 174 respondents were mainly females (n=163, 93.7%) aged between 21 to 68 years (mean age = 35.6 ± SD = 6.65 years). The majority were Australian-born (n= 146, 83.9%) and tertiary educated (n=126, 72.4%), with adequate functional health literacy scores (n=149, 85.6%). The following is a breakdown of the Panadol™ products purchased by the respondents, some of which had bought more than one product: Children's Panadol® Baby Drops 1 month - 2 years
Children’s Panadol® Suspension 1 - 5 years (n=74, 42.5%); and Children’s Panadol® Elixir 5 – 12 years (n=71, 40.8%). The respondents’ children (who had received the Children’s Panadol™) were aged between one-month and 12.6 years (mean age 5 years). The main reasons for administering Children’s Panadol™, which was mostly purchased from pharmacies (n=172, 98.9%), were fever (n=130, 74.7%) and pain (n=95, 53.4%).

Knowledge about Children’s Panadol:

Active ingredient

Almost all respondents knew that Children’s Panadol™ contained paracetamol (n= 168, 96.6%). However, some also believed that the product contained alcohol (n= 36, 20.7%), aspirin (n= 24, 13.7%), codeine (n= 23, 13.2%) and/or ibuprofen (n= 18, 10.4%).

Contraindications and potential side effects

Respondents’ knowledge of contraindications and side effects was variable (Table 1). Prior to administering the children’s paracetamol, the majority of respondents (83.3%) knew to check with their doctor or pharmacist if their child was taking other medications. Notably however, less than a third (30.5%) knew that they did not need to check with their doctor or pharmacist if their child had asthma. The respondents’ knowledge about allergies to other medications (e.g. ibuprofen, aspirin) or food products (e.g. milk, eggs, gluten) not being a contraindication to paracetamol administration was variable; with less knowledge about food products (47.7%-57.5%) than medications (64.4%-74.1%) (Table 1).

Respondents’ knowledge of the potential side effects caused by paracetamol overdosing was low
While just over 60% of the respondents knew that liver toxicity was a potential side effect, approximately one-fifth (21.3%) were unsure of any potential side effects associated with giving too much paracetamol.

### Table 1: Correct responses for possible contraindications or side-effects

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Number of correct responses</th>
<th>Percentage of correct responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Should you check with your doctor or pharmacist before giving Children’s Panadol™ (correct answer in brackets)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If they have asthma (no)</td>
<td>53</td>
<td>30.5%</td>
</tr>
<tr>
<td>If they are on other medications (yes)</td>
<td>145</td>
<td>83.3%</td>
</tr>
<tr>
<td>If they have heart disease (no)</td>
<td>19</td>
<td>10.9%</td>
</tr>
<tr>
<td><strong>You can give Children’s Panadol™ to children who are…</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allergic to ibuprofen (yes)</td>
<td>129</td>
<td>74.1%</td>
</tr>
<tr>
<td>Allergic to aspirin (yes)</td>
<td>112</td>
<td>64.4%</td>
</tr>
<tr>
<td>Allergic to milk products (yes)</td>
<td>100</td>
<td>57.5%</td>
</tr>
<tr>
<td>Allergic to eggs (yes)</td>
<td>93</td>
<td>53.4%</td>
</tr>
<tr>
<td>Gluten intolerant (yes)</td>
<td>83</td>
<td>47.7%</td>
</tr>
<tr>
<td><strong>Which of the following side effects might be experienced when given too much Children’s Panadol™</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver poisoning (yes)</td>
<td>109</td>
<td>62.6%</td>
</tr>
<tr>
<td>Stomach problems (no)</td>
<td>76</td>
<td>43.7%</td>
</tr>
<tr>
<td>Unsure</td>
<td>37</td>
<td>21.3%</td>
</tr>
</tbody>
</table>

Reading and comprehending dosage instructions:

After being provided with information from a Children’s Panadol® Elixir 5 – 12 years packet, participants were asked to identify the correct dosage; a) if their child was 9 years old; and b) if
their child weighed 21 kilograms. The majority of respondents correctly interpreted recommended dosage instructions for both scenarios (n=167, 96%; and n=150, 86.2% respectively). However, approximately a quarter of the respondents (n=40, 23.0%) did not know that a four hour interval was required between doses, and a similar proportion of respondents (n=46, 26.4%) did not know that four doses is the maximum number a child should receive within a 24 hour period. Furthermore, just under half of the respondents incorrectly believed that Children’s Panadol™ could be safely given (without medical advice) for more than two days in a row (n=80, 46%), with over one-third incorrectly believing that paracetamol could be safely administered to children for up to a week (n=73, 42%).

DISCUSSION

The findings from this study show gaps in respondents’ knowledge regarding the safe administration of paracetamol to children, despite being a highly educated sample with high functional health literacy. For instance, although the majority knew that paracetamol was the active ingredient in Children’s Panadol™, many believed that the product contained other active ingredients and that food allergies were contraindications for the administration of paracetamol to children. This may inadvertently result in children not receiving paracetamol when it is a safe option for the treatment of fever and pain, as was the case for many children included in this study. Also, approximately one-quarter of the respondents were not aware of the correct interval between doses and did not recognise that four doses is the maximum a child should receive in a day. This lack of knowledge may lead to accidental overdosing of the child in their care. What is even more concerning is that almost 40% of the respondents did not know that liver toxicity is a potential side effect associated with paracetamol overdose. These results are similar to those of
other studies which investigated adults’ knowledge about paracetamol doses and toxicity (12,13).

It could be argued therefore, that even though the majority of respondents in the current study purchased their children’s Panadol™ from a pharmacy (where they presumably received information about the product), further strategies are required to supplement this information channel and address their knowledge gaps. These strategies need to be considered by pharmacists working in both community and hospital settings, and could include improved pharmacist-consumer communication, as well as improved general knowledge about the safe administration of paracetamol and potential adverse events associated with overdose.

This study has a number of limitations, which include the use of a self-report survey, possibly introducing reporting bias. The sample was relatively small and not reflective of the wider population as it was highly educated [86.2% of the sample had a trade or university qualification as compared to 43.6% of the population as a whole (14)] and the majority of respondents were born in Australia [83.9% in the sample compared to 72.3% for Australia as a whole (15)]. This may affect the generalisability of the results to the wider Australian population. It is important however, to consider the consequences of adult caregivers who are less educated with low functional health literacy, or are not fluent in English, because they may be experiencing even bigger gaps in their knowledge about the safe use and administration of paracetamol to the children in their care.

**CONCLUSION**

Despite being a highly educated sample, our findings suggest caregivers administering children’s
paracetamol have gaps in their product knowledge. This is an important public health concern given the ready access to over-the-counter paracetamol products for children. To address these knowledge gaps, it is important to consider multiple strategies which could include: improving pharmacist-consumer communication and general knowledge about paracetamol and potential adverse events associated with overdose.
REFERENCES


Appendix 1:

Section A:

1. Which medicine did you buy?
   - Children's Panadol Colour-free Baby Drops 1 month - 2 years
   - Children's Panadol Colour-free Suspension 1 - 5 years
   - Children's Panadol Elixir 5 - 12 years

2. Where did you purchase this medicine?
   - From a pharmacy
   - Online
   - Supermarket
   - Other (please specify)__________________________

3. How old is the child and/or children who will be receiving this medicine?
   - Age of child 1 ___years ___months
   - Age of child 2 ___years ___months
   - Age of child 3 ___years ___months
   - Age of child 4 ___years ___months
   - Age of child 5 ___years ___months

4. Why did you buy this medicine for your baby or child?
   - You can tick more than one box if necessary.
     - Teething
     - Ear ache
     - Sore throat
     - Sleep disturbances
     - Temperature (fever) 37.5 degrees or above
     - Pain
     - After vaccination
     - Other (please specify)__________________________

5. What ingredients are in this medicine? Please choose YES, NO or Unsure for each option.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paracetamol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibuprofen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codeine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. When should you check with your doctor or pharmacist before giving this medicine to your baby or child? Please choose YES, NO or Unsure for each option.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>If they have asthma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If they are on another medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If they have a heart condition</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Please choose YES, NO or Unsure for each of the following options.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you give Panadol to children who are allergic to ibuprofen?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you give Panadol to children who are allergic to aspirin?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you give Panadol to children who are allergic to milk products?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you give Panadol to children who are allergic to eggs?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you give Panadol to children who are gluten intolerant?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Which of the following side effects might be experienced by babies or children when given too much of this medicine? Please tick as many answers as you think are correct.
   - Liver poisoning
   - Stomach problems
   - Unsure

9. What is the MAXIMUM recommended dose of this medicine that you can give a baby or child in one day (24 hour period)? Please tick ONE answer only.
   - 2 doses
   - 3 doses
   - 4 doses
   - 6 doses
   - Unsure

10. How many days in a row can you safely give this medicine to a baby or child? Please tick ONE answer only.
    - Up to 2 days
    - Up to a week
    - Up to a month
    - Up to 6 months
    - Up to 12 months or longer

11. If you gave a dose of this medicine to a child at 8 am, when is the earliest time that another dose can be given on the same day? Please tick ONE answer only.
    - At 10.00 am
    - At 12:00 noon
    - At 2.00 pm
At 3:00 pm
At 4:00 pm

To answer questions 12 and 13 below, please read the information provided in the table below, which is also available on the packaging for Children's Panadol Elixir 5 years – 12 years.

<table>
<thead>
<tr>
<th>Age</th>
<th>Average Weight</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6 years</td>
<td>18-20 kg</td>
<td>6 mL</td>
</tr>
<tr>
<td>6-7 years</td>
<td>20-22 kg</td>
<td>6-7 mL</td>
</tr>
<tr>
<td>7-8 years</td>
<td>22-25 kg</td>
<td>7-8 mL</td>
</tr>
<tr>
<td>8-9 years</td>
<td>25-28 kg</td>
<td>8-9 mL</td>
</tr>
<tr>
<td>9-10 years</td>
<td>28-32 kg</td>
<td>9-10 mL</td>
</tr>
<tr>
<td>10-11 years</td>
<td>32-36 kg</td>
<td>10-11 mL</td>
</tr>
<tr>
<td>11-12 years</td>
<td>36-41 kg</td>
<td>11-13 mL</td>
</tr>
</tbody>
</table>

12. If your child weighed 21 kilograms, what dose of Children's Panadol (Elixir 5 - 12 years) should you give? Please tick ONE answer only.
   - 6 - 7mL
   - 7 - 8mL
   - 8 - 9mL
   - 9 - 10mL

13. If your child is 9 years old what dose of Children's Panadol (Elixir 5 - 12 years) should you give? Please tick ONE answer only.
   - 6 - 7mL
   - 8 - 9 mL
   - 10 - 11 mL
   - 11 - 13 mL

**Section B: About you**

14. How old are you? ___years
15. What is your sex? ___male ___female
16. What country were you born in?
17. What language do you usually speak at home?
18. What is the highest level of education you reached? Please tick ONE box.
   - Primary school or Year 6 and below
   - Junior high school or Years 7 to 10
   - Senior high school or Years 11 and 12
TAFE or trade certificate
College or University

19. How confident are you filling out medical forms by yourself?

all of the time
most of the time
some of the time
a little of the time
none of the time