EFFECT OF BUZZY® APPLICATION ON PAIN AND INJECTION SATISFACTION IN ADULT PATIENTS WHO RECEIVED INTRAMUSCULAR INJECTION

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Within the category of parenteral medications are intramuscular (IM) injections (WHO, 1999).
The administration of intramuscular (IM) injection is a basic nursing skill and is a common nursing procedure in the clinical setting.

• IM injections usually cause some degree of pain at the injection site.

Patients are often afraid of receiving injections because they perceive that it will be painful.


• Injection pain is related to the penetration of the skin by the needle and to the mechanical and chemical effects of the drug during and after its injection.*

Unnecessary pain can damage the nurse-patient relationship, whereas knowledge of alternative techniques can improve patient care and satisfaction.

• Over the years, clinicians have tried to explore various methods to reduce pain, including the pain of injections.

These studies have examined the effect of different factors and interventions, such as

- cold,
- manual pressure,
- acupressure,
- needle temperature,
- two-needle technique,
- injection speed,
- patient positioning and
- the Z-track technique.


In the literature there are few studies related to the usage of Buzzy device for reducing the pain of IM injection and there isn’t any study for the adult about it yet.
How is the buzzy’s mechanism?

- There is a cold pack on the part of the device where it contacts the skin.
- It works with batteries and conducts cold application and vibration on the area.
- The on/off button at the top, cold pack at the back, and vibration below the device.
Buzzy device (cold and vibration) is one of the non-pharmacologic methods used and acts through local skin desensitisation according to gate-control theory.

Buzzy which combination of cold and high frequency vibration is between brain and pain, and the pain is blocked out.

https://www.youtube.com/watch?v=r3NSpi1llqc
Buzzy is blocked the pain according to gate control theory.

At the same time, Buzzy with distraction causes the reduce of the injection pain and anxiety on the patient.

This research was carried out as a single-blind, randomized, controlled study in order to investigate the effect of Buzzy application on pain and injection satisfaction before and during injection.
This research was carried out in Physical Therapy Service of 75th Year Milas State Hospital in Turkey between 12 November 2012 and 11 January 2013.
Patients were chosen;

Who haven’t injections in recent week,

Who have no injection site abscess, haematoma, necrosis,
who have no problem of seeing and hearing,

who were between 25 and 85 years of age and
who could understand the visual analog scale (VAS)
RANDOMIZATION
The patients randomized according to age and sex by drawing lots.
A total of 65 patients (application group=33, control group=32) for whom IM diclofenac sodium injection was ordered and who met the selection criteria comprised the sample of research.
Data collection instruments

Patient Information Form,

Visual Analog Scale (VAS)

Buzzy®
## Patient Information Form

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>Body mass index (BMI)</td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
</tr>
</tbody>
</table>
Visual Analog Scale (VAS)
Data Collection Procedure
Patients who met the selection criteria comprised the sample of research.

Randomization

Application Group

Control Group

All participants received an explanation of the study before participating and gave informed written consent before voluntary participation.

The device is placed on injection area and 30 second later, it is placed above 3 centimeters of the application area.

Standard injection was applied to control group.

After application of injection pain and injection satisfaction scores were evaluated according to visual analog scale (VAS).
Application of buzzy device on a patient

Intramuscular injections were applied to ventrogluteal site.
Statistical analysis was performed with Statistical Package For Social Science (SPSS) 20.0.

In evaluation of data chi-square, Mann-Whitney U and Kruskal Wallis tests were used.
For the research;

The study was approved by the local ethics committee and the hospital.

All participants received an explanation of the study before participating and gave informed written consent before voluntary participation.
RESULTS

60 patients were recruited to the study, with ages ranging from 25 to 85 years, mean age 52.17 years (SD=1.65).
There was a significant lower pain intensity score application group than control group \((M-U= 83)\) \((p= 0.000)\).
There was a significant higher injection satisfaction score application group than control group (M-U= 114.5) (p= 0.000).
### Pain and Satisfaction Table

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Application</th>
<th>Control</th>
<th>Application</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-55</td>
<td>5.56±6.41</td>
<td>18.50± 6.78</td>
<td>94.39±6.26</td>
<td>87.25±16.91</td>
</tr>
<tr>
<td>56-85</td>
<td>3.60±1.92</td>
<td>16.88±12.37</td>
<td>95.33±2.87</td>
<td>82.88±16.09</td>
</tr>
</tbody>
</table>

- M-U* = 112.5  
  \( p = 0.409 \)
- M-U* = 97.5  
  \( p = 0.249 \)
- M-U* = 134.5  
  \( p = 0.985 \)
- M-U* = 121.5  
  \( p = 0.806 \)

There was no statistically significant difference in pain and injection satisfaction score in age between application and control group.
There was no statistically significant difference pain and injection satisfaction score in gender between application and control group.

<table>
<thead>
<tr>
<th>GENDER</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>PAIN</td>
<td></td>
<td>Satisfication</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Application</td>
<td>Control</td>
<td>Application</td>
<td></td>
<td>Control</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td>3.70±2.32</td>
<td>17.23±7.59</td>
<td>95.85±2.96</td>
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<td>84.73±15.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6.15±7.26</td>
<td>18.70±14.07</td>
<td>93.23±6.88</td>
<td></td>
<td>85.80±6.86</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

M-U*= 89.5
p= 0.130

M-U*= 104
p= 0.807

M-U*= 100
p= 0.266

M-U*= 92
p= 0.463
<table>
<thead>
<tr>
<th>EDUCATIONAL LEVEL</th>
<th>PAIN</th>
<th>SATISFACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Application</td>
<td>Control</td>
</tr>
<tr>
<td>primary school and below</td>
<td>4.00±2.14</td>
<td>17.85±10.42</td>
</tr>
<tr>
<td>Middle school and over</td>
<td>7.14±10.11</td>
<td>16.80±6.72</td>
</tr>
<tr>
<td></td>
<td><em><em>M-U</em> = 89.5</em>*</td>
<td><em><em>M-U</em> = 61.5</em>*</td>
</tr>
<tr>
<td></td>
<td><strong>p= 0.947</strong></td>
<td><strong>p= 0.755</strong></td>
</tr>
</tbody>
</table>

There was no statistically significant difference pain and injection satisfaction score in educational level between application and control group.
<table>
<thead>
<tr>
<th>BMI (Body Mass Index)</th>
<th>Application</th>
<th>Control</th>
<th>Application</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal weight</td>
<td>4.43±2.15</td>
<td>13.67±7.89</td>
<td>95.29±3.50</td>
<td>87.33±7.12</td>
</tr>
<tr>
<td>Overweight</td>
<td>6.75±7.61</td>
<td>13.85±4.74</td>
<td>93.50±7.26</td>
<td>82.54±19.84</td>
</tr>
<tr>
<td>Obese</td>
<td>4.43±2.15</td>
<td>23.38±11.96</td>
<td>95.71±2.81</td>
<td>86.54±15.81</td>
</tr>
</tbody>
</table>

*H*\(**\) = 6.059  
\(p=0.048\)

*H*\(**\) = 7.825  
\(p=0.020\)

*H*\(**\) = 0.365  
\(p=0.833\)

*H*\(**\) = 0.021  
\(p=0.941\)

• Overweight patients reported increased pain intensity compared with normal and obese patients in application group.
• Obese patients reported increased pain intensity compared with normal and overweight patients in control group.
• There was no statistically significant difference injection satisfaction score in BMI between application and control group.
it was determined that Buzzy® device was an effective method in decreasing injection pain and in improving post-injection satisfaction.
In the literature;
It has been learnt that the studies with Buzzy are also applied at IM injection, vaccination and venipuncture on the children.

All the studies with Buzzy (different sample and method) confirm our study.
Buzzy should be used for reduce IM injection pain by nurses,

It should be compared another methods which reduce IM injection pain

In order to improve the development of evidence-based on different age group should be research.