Trauma and Brain Development

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Acknowledgement

• Difficult topic intellectually and emotionally
• Will be going quickly to condense in 30 minutes
• Each person coming with their own knowledge and experience
• Various types of trauma
• Ask questions as needed
• Care for yourself as needed
Common Misconceptions

• “They were so little it didn’t impact them that much”
• “We only fought when they were in bed, they didn’t hear it, it couldn’t have affected them”
• “They never talk about it. It must not have bothered them that much”
• “They only witnessed him hurt me, he never hurt them”
Parts of the Brain

Brain Stem

• “Reptilian Brain”
• First to develop in utero.
• Basic functioning i.e. breathing, sleeping, feeding, walking
• Is wrapped in other layers of the brain and is protected there.
Parts of the Brain

**Limbic System**

• “Mammalian Brain”

• Considered the ‘emotional brain’

• Responsible for memory, learning, behaviour, emotional states

• Amygdala located in the Limbic System
  - Amygdala regulates aggressive and sexual behaviours
  - *Amygdala responsible for the fear response*
  - Amygdala also associated with emotional learning
  - Highly sensitive to stress
Parts of the Brain

Neocortex

• “Human Brain”
• Made up of several ‘lobes’
• Responsible for the brain’s most complex functions
• Responsible for impulse control, higher-ordered and abstract thinking, reasoning and cause and effect thinking
• Communicates with the rest of the brain
• Especially at risk to emotional stress
• Last area of the brain to develop and isn’t fully developed until early 20’s
• Left side shows:
  • Development where there has been no experience of trauma, abuse, neglect or injury.
  • Each brain layer is able to develop to it’s full functioning

• Right side shows:
  • Development where there has been an experience of trauma
  • Early brain development becomes preoccupied with survival and this becomes the overriding function of the brain
Physical and Biological Impacts of Trauma

Parasympathetic
- Constricts pupil
- Stimulates salivation
- Inhibits heart
- Constricts bronchi
- Stimulates digestive activity
- Stimulates gallbladder
- Contracts bladder
- Relaxes rectum

Sympathetic ganglia

Sympathetic
- Dilates pupil
- Inhibits salivation
- Relaxes bronchi
- Accelerates heart
- Inhibits digestive activity
- Stimulates glucose release by liver
- Secretion of epinephrine and norepinephrine from kidney
- Relaxes bladder
- Contracts rectum
How the Nervous System Helps Us Defend Ourselves

Fight-Flight Responses: “Don’t just sit there—do something!”

Freeze-Submit Responses: “Don’t move—it’s not safe”

Neurochemical release triggers Parasympathetic System

Sympathetic Nervous System: when the amygdala fires, the body uses an adrenaline rush to increase heart rate and respiration, causing muscles to tense and a surge of energy that prepares us for action. The frontal lobes shut down to increase speed of response.

Parasympathetic Nervous System: when it isn’t safe to flee or fight, or when ‘it’s over,’ other chemicals slow heart rate and respiration, leading to physical collapse, exhaustion, weakness, shaking and trembling, increased gastro-intestinal activity, and the survival responses of freeze and submit.

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Use-Dependent Brain

• “Use it or lose it” applies with neurobiology as well
• We are born with an excess of synapses. Through ‘pruning’ our brains get rid of synapses we don’t use
• The more an experience is repeated, the more our neurons activate these pathways and they can become permanent
• Therefore, the more we are in a fear response, the more that response becomes our ‘norm’
• Repeated trauma in childhood literally alters our brains
Sensitization

- Our brains are excellent at making patterns
- Our brains create meaning by taking cues from past experiences during new experiences
- Experiencing trauma in early childhood means that new experiences will be associated with that earlier trauma
- Relatively ‘minor’ stressors can elicit genuine fear responses
## Trauma Impacts on Emotional States

<table>
<thead>
<tr>
<th>State</th>
<th>Brain Area</th>
<th>Amount of Information Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calm</td>
<td>Neo Cortex</td>
<td>Normative consumption of information</td>
</tr>
<tr>
<td>Alert</td>
<td>Sub Cortex</td>
<td>70% consumption of information</td>
</tr>
<tr>
<td>Alarm</td>
<td>Limbic</td>
<td>40% consumption of information</td>
</tr>
<tr>
<td>Fear</td>
<td>Midbrain</td>
<td>10% consumption of information</td>
</tr>
<tr>
<td>Terror</td>
<td>Brainstem</td>
<td>0% consumption of information</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State</th>
<th>Cognition Type</th>
<th>Forward Thinking Abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calm</td>
<td>Abstract</td>
<td>Can think about the future</td>
</tr>
<tr>
<td>Alert</td>
<td>Concrete</td>
<td>Can think forward from days to hours</td>
</tr>
<tr>
<td>Alarm</td>
<td>Emotional</td>
<td>Can think forward from hours to minutes</td>
</tr>
<tr>
<td>Fear</td>
<td>Reactive</td>
<td>Can think forward from minutes to seconds</td>
</tr>
<tr>
<td>Terror</td>
<td>Reflexive</td>
<td>Sense of time is lost</td>
</tr>
</tbody>
</table>
Impacts on Children’s Behaviour

The impacts of trauma and maltreatment on children’s behaviour varies particularly depending on the age of the child, some common behaviours include:

• Difficulties in being soothed, calmed when upset
• Being clingy, irritable, sad, worried/anxious etc
• Aggressive and/or defiant behaviours
• Difficulties with sleeplessness, dreams, bed wetting
• Difficulties with class work or behaviour at school. OOSH and childcare environments
• Taking on parental responsibilities
• Running away or truanting from school
• Self harming, threats to self harm or suicide attempts
Impacts on Children’s Social and Emotional Behaviour

• Difficulties in making friends
• Difficulties in communicating their feelings with others
• Aggressive or violent behaviour towards others
• Difficulties in being able to develop certain emotions
• Difficulties in being able to express their emotions inline with social expectations
• Being excluded by their peer group
• Withdrawing from social interaction with others
• Low opinion of self and abilities
• Making excuses for appearance or behaviours including difficulties with school work and memory
Long Term Impacts on Children

- Repeated and long term suspensions from school
- School refusal
- Unemployment
- Entry to Justice / Correctional Systems
- Unhealthy adult relationships
- Drug and alcohol abuse
- Homelessness
Hope

- Our brains are plastic and adaptable
- Children’s and adolescent’s brains are the most plastic, however everyone’s brain is adaptable
- Even as adults we can learn new coping, relaxation and breathing strategies to help heal and recover from trauma
- Early intervention is still best and as Mandatory Reporters it is up to us to recognise the serious threat of trauma in childhood and work to ensure the child is supported to recover and thrive
QUESTIONS
REFERENCES
