Chapter 13: Stress and health

Learning Activity suggested answers

Learning Activity 13.1 (p. 516)

1

a  Distinguish between stress, stressors and the stress response with reference to a scenario not used in the text.

• stress: a state of physiological and psychological arousal produced by internal or external stressors that are perceived by the individual as challenging or exceeding their ability or resources to cope

• stressor: any person, situation or event that has the potential to produce stress, e.g. extremes in temperature, loud noise, intense light, changing schools, failing an exam, living in poverty, arguing with friends

• stress response: the physiological and psychological change that occurs when people are confronted by a stressor, e.g. fatigue, forgetting things, biting your fingernails, peptic ulcer, dizziness, the flu

Stressors are therefore (real or imagined) situations or events and stress is the individual’s subjective reaction to the stressors, if they perceive they do not have the necessary resources to cope. An individual’s subjective reaction to the stressors (i.e. stress) triggers a number of physiological and psychological changes (i.e. stress response).

b  When is a stressor likely to be described as chronic?

A stressor is likely to be described as chronic when it is ongoing, it persists and is present over a long period time.

For example: constantly struggling to pay bills; living in poverty; living with a chronic physical illness; feeling trapped in an unhappy relationship; living near a place that constantly produces loud noises such as an airport; working in a high-pressure job, having to travel a very crowded/busy route to work every day e.g. having to be very crowded train or sit in a traffic jam every day.

c  Explain the relationship between stress, stressors and the stress response with reference to a scenario not used in the text.

Explanation: a stressor can cause stress and this is manifested in the stress response. Discuss student examples to clarify conceptual understanding.

2  Consider the different classifications of stressors. Explain both of your answers.

a  Give an example of an internally sourced stressor that is not psychological.

Examples may include stressors such as:

• hunger
• thirst
• fatigue
• pregnancy
• ‘jet lag’
• physical injury
• migraine/headache
• abdominal problems
• chronic pain
• infection
• disease
• arthritis
• inflammation
• fever

b Give an example of how a physical stimulus may be a stressor.

Example: a factory worker works in an extremely noisy (90+ decibels) environment during their 8-hour shift each day. The noise is physically uncomfortable, interferes with the worker’s ability to concentrate on their work tasks and prevents any verbal interaction with their co-workers. The factory worker experiences stress as a result.

A physical stimulus may be a stressor because it can trigger a stress response with physiological and psychological components e.g.

• physiological - disturb an individual’s internal, bodily environment), leading to activation of regulatory mechanisms to deal with the stressor)

• psychological - preoccupy a person and/or prevent them from functioning as they normally would, and therefore leading to an impairment in functioning

3 Consider the stressors in table 13.1 derived from research conducted over 20 years ago.

a Which stressors for middle–late adolescents do you believe are still relevant or no longer relevant?

Discuss student examples to clarify conceptual understanding.

b Which stressors do you believe might be included in the list if the studies were to be replicated by contemporary researchers?

Discuss student examples to clarify conceptual understanding.

4

a What is the fight–flight response?

The fight–flight response is an involuntary action to a perceived threat/danger/emergency resulting in a state of physiological readiness to deal with a sudden an immediate threat by either confronting it or running away to safety.

b What type of stimulus and/or stressor other than a threat can initiate the response?
The fight-flight response can be initiated by physical and psychological stimuli e.g.
- physical: being in a car accident, sight of a snake, hearing thunder, slipping on a wet floor, door slamming suddenly, extreme temperature,
- psychological: worrying about an exam, having to wait in a queue, getting angry after a putdown, running late for work or school, arguing with someone.

Note: Sometimes when the fight or flight response is triggered, it is a ‘false alarm’ i.e. there is no real threat to survival e.g. you see something moving across the floor that you think is a big spider, but which is actually not. Therefore, the fight-flight response can also be triggered by perceived threats.

c Describe a fight–flight response you have experienced and physiological changes occurring of which you were aware and those of which you were unlikely to be aware. Refer to the text and figure 13.3 when outlining changes.
Discuss student examples to clarify conceptual understanding.

d Explain why the fight–flight response cannot be consciously controlled.
Explanation should demonstrate understanding that fight–flight is an innate, involuntary response that involves physiological responses (not psychological) initiated and regulated by the autonomic nervous system (which functions relatively independently of the brain).

5

a What is the HPA axis?
The HPA axis is a chain of physiological reactions during a stress response involving the hypothalamus, pituitary gland and the adrenal cortex/glands.

b Outline the key physiological changes involved in the HPA axis.
When a threat is perceived/during a stress response:
- the hypothalamus is activated;
- the hypothalamus then stimulates the nearby pituitary gland (master/main gland of the endocrine system) to which it is connected;
- the pituitary gland secretes the hormone ACTH (andrenocorticotropic hormone) into the bloodstream;
- ACTH travels through the bloodstream and stimulates the adrenal cortex (outer layer of the adrenal gland);
- adrenal cortex secretes corticosteroids (‘stress hormones’) e.g. cortisol
- cortisol energises the body (by increasing blood sugar and metabolism)

c When is the HPA axis like to be initiated?
The HPA axis is likely to be initiated when an individual is experiencing chronic stress.
When a stressor/threat persists (i.e. it is a chronic stressor), additional physiological resources/responses are required as the body cannot maintain the intensity of the fight–flight reactions for a prolonged period. One reason is that the effects of adrenaline and noradrenaline do not last long. In these circumstances, the HPA axis is activated and cortisol along with other corticosteroids are secreted.
6 What ‘stress hormones’ are released:
   a during the fight-flight response?
      adrenaline and noradrenaline
   b if the fight-flight response persists?
      cortisol (and other corticosteroids)

7 Explain the role of the adrenal glands in physiological responses to stress.
The adrenal glands play a significant role in physiological responses to stress.
   • The adrenal medulla (inner part) releases adrenaline and noradrenaline into the bloodstream during the fight-flight response.
   • The adrenal cortex (outer part) releases corticosteroids (e.g. cortisol) if the stressor persists (or the stressor is persisting)
   • The adrenal medulla is involved in the fight-flight response and the adrenal cortex is involved in the HPA axis.

8 A research study measuring the effectiveness of a stress reduction course used cortisol levels as their dependent variable. Using your knowledge of physiological responses to stress, answer the following questions.
   a Is cortisol level a valid dependent variable for this study?
      Yes. The level of cortisol circulating in the bloodstream is assumed and likely to be elevated at during baseline measurements at the start of the study/during pre-testing and at progressively lower levels if the stress management course is effective. Presumably, the participants in the study would be people experiencing “chronic stress”. In order to deal with their chronic stress, activation of the HPA axis’ would result in higher than normal cortisol levels in the bloodstream. Cortisol is therefore a valid, measureable dependent variable.
   b If the stress reduction course was effective, what would happen to the participants’ cortisol levels?
      If the stress reduction program is effective, then the researchers should observe a reduction in participants’ cortisol level during and post-course when compared to pre-course levels.

9 You are a passenger in a car that has suddenly slammed on its breaks to avoid hitting a dog. Outline and explain the physiological changes likely to occur:
   a during the first 30 seconds
      The fight-flight response will be automatically activated in response to the sudden, unexpected action and potential threat/emergency This involves the hypothalamus -> sympathetic nervous system -> adrenal medulla -> adrenaline and noradrenaline secreted into the bloodstream -> circulate through the body -> activate organs -> specific physiological changes e.g. increased respiration and heart rates, pupil dilation etc.
      HPA axis changes are not relevant.
   b after about 20 minutes.
The potential threat/emergency will have definitely passed and the parasympathetic system will have restored the body to normal functioning.

Given the nature of the stimulus, some restorative changes will probably occur in the 30 second period, depending on the individual.

**Learning Activity 13.3 (p. 518)**

1. **a** Distinguish between eustress and distress.
   - Eustress is a positive psychological response to a stressor whereas distress is a negative psychological response to a stressor.
   - Eustress is typically short-term, desirable, can provide the energy and motivation to achieve a goal or peak performance, and is not considered to be harmful or damaging to the body.
   - Distress can be short-term or long-term, objectionable or unwanted, usually adversely impacts on goal attainment or peak performance, and, when chronic/prolonged, can have harmful or damaging effects to the body.

2. **b** Describe two characteristics of eustress and two characteristics of distress.
   - **Eustress** characteristics may include:
     - positive psychological state
     - Typically short-term experience of responses such as
     - alertness
     - excitement
     - feeling positive
     - feeling motivated
     - feeling activated/energised
   - **Distress** characteristics may include:
     - negative psychological state
     - short-term or long-term experience of responses such as
     - anger
       - anxiety
       - nervousness
       - irritability
       - tension

2. Outline three events and/or situations that could cause eustress in one person and distress in another. Explain why the different responses can occur.
   - Discuss student examples to clarify conceptual understanding.
Copy the following table. In the first column, briefly describe the stressors that resulted in eustress and three stressors that resulted in distress. In the second column, classify each stressor as either predominately eustress or distress. In the last column, explain each classification.

Discuss student examples to clarify conceptual understanding.

**Learning Activity 13.4 (p. 520)**

1. Explain the meaning of the phrase ‘psychological response to stress’.

   Explanation should refer to stress reactions other than physiological responses that involve change(s) in thoughts and feelings.

2. In what three ways can psychological responses be distinguished from physiological responses to stress?

   Distinguishing characteristics may include:
   - psychological responses primarily involve the mind/mental processes, whereas physiological responses primarily involve the body/bodily processes;
   - psychological responses are indirectly observed (including self-reports), whereas physiological responses can be directly observed;
   - physiological responses typically occur involuntarily and cannot be consciously controlled, whereas psychological responses are not necessarily involuntary and many individuals can learn to exercise some degree of control over them;
   - many physiological responses are largely predictable, whereas psychological responses are more variable among individuals.

3. Construct a table in which you summarise psychological responses to stress under the three categories described in the text.

   In general, psychological responses to stress are often divided into three categories: behavioural, emotional and cognitive changes.

<table>
<thead>
<tr>
<th>Type of change</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>emotional</td>
<td>anxiety</td>
</tr>
<tr>
<td>(influence feelings)</td>
<td>tension</td>
</tr>
<tr>
<td></td>
<td>irritability</td>
</tr>
<tr>
<td></td>
<td>anger</td>
</tr>
<tr>
<td></td>
<td>depressed</td>
</tr>
<tr>
<td></td>
<td>short-tempered</td>
</tr>
</tbody>
</table>
| cognitive (influence mental abilities and thought processes) | difficulties with concentrating/maintaining focus  
| - difficulties with decision-making  
| - difficulties with problem-solving  
| - difficulties with thinking clearly  
| - difficulties with thinking rationally  
| - difficulties with learning  
| - difficulties with remembering  
| - catastrophising  
| negative attitudes e.g. towards self, others, school, work etc. |

4 Give an example of how prior experience may influence a psychological response to stress.

Prior experience with a situation or event can either alleviate or exacerbate a person’s psychological response to stress/a stressor.

Examples: Joe has just found out that he has got two important exams on the same day.

- The last time Joe had two exams on the same day he failed both of them because he found having to study for two subjects concurrently too difficult to manage. This prior experience has triggered a stress reaction (i.e. he may be experiencing physiological arousal, feeling anxious and may be thinking that he couldn’t manage and failed last time this situation happened, so it will happen again).

- The last time Joe had two exams on the same day he got over 80% for both of them. He therefore experiences quite a different reaction (i.e. he may be feeling quite upbeat and may be thinking that he did really well the last time he had two exams on the same day, so there is no reason to think that the same thing won’t happen this time).

5 Suggest how an individual’s personal interpretation of a stressor may impact on their stress response.

This question is intended to encourage students to contemplate the role of personal interpretation prior to studying the Lazarus and Folkman model.

Students should recognise that an individual’s personal interpretation of stressor (a kind of stressor ‘appraisal’) and their ability to cope with it may impact on their stress response. For example:

- a situation or event will only lead to stress if an individual interprets (appraises) that situation or event as unpleasant, uncomfortable or perhaps ‘the worst thing that could happen to me’ and they also think that they do not have the necessary resources to cope with it;

- an individual’s personal interpretation of the situation/event and their resources for coping with that situation/event therefore determines whether or not they experience a stress response (and the nature of their stress response);

- an individual’s personal interpretation of a stressor can mediate their stress response.
Learning Activity 13.5 (p. 520)

Visual presentation on the stress response

Using an example of a potential stressor at school or college or in the workplace, construct a concept map in which you show potential physiological and psychological responses to the stressor and the ways they may interact.

Learning Activity 13.6 (p. 525-6)

1. Explain the meaning of the phrase ‘psychological determinants of the stress response’ with reference to an example and explain how psychological and physiological determinants differ.

Explanation should demonstrate understanding of:

- determinant, i.e. any factor/variable that directly or indirectly influences something occurring, e.g. an infection would be a determinant in the development of a disease;
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1. ‘psychological determinants of the stress response’ refers to the psychological factors that ‘determine’ of influence whether or not we experience a stress response;
2. psychological determinants can include such factors as attitudes, motivation, level of self-esteem, coping skills, personality characteristics, perception of control;
3. Lazarus and Folkman (1984) emphasised the role of appraisal in the determination of the stress response, i.e. if a person appraises a situation/event as stressful then they will experience a stress response;
4. physiological determinants of the stress response refers to the physiological (bodily) changes that determine whether or not we experience a stress response;
5. physiological determinants include activation of the sympathetic nervous system, activation of the HPA-axis, the presence of stress hormones such as catecholamines (adrenaline and noradrenaline) and cortisol;
6. psychological determinants primarily involve mental processes whereas physiological determinants involve bodily/biological processes.

2. Briefly describe Lazarus and Folkman’s transactional model of stress and coping.

According to Lazarus and Folkman’s transaction model of stress and coping (1984):

- stress involves an encounter (‘transaction’) between an individual and their external environment;
- stress is a function of a discrepancy between perceived demands of a situation/event and the person’s resources for meeting those demands;
- this means that the person’s psychological appraisal (interpretation/perception) of the situation and of the coping resources are critical for determining whether the person experiences stress and shows a stress response;
- primary appraisal is the first appraisal of the potential threat (e.g. vicious looking dog walking your way): primary appraisal results in a decision about whether the stressor is (a) irrelevant (b) benign-positive or (c) stressful—if it is deemed stressful, the person then engages in additional appraisals: (i) harm-loss, or how much damage as already occurred, (ii) threat, or expectation of future harm, and (iii) challenge or opportunity for growth;
- secondary appraisal is an appraisal of the resources available for meeting the potential threat (e.g. your running ability, traffic volume and flow that may preclude a quick road cross);
- as a result of secondary appraisal, the person may:
  - engage in reappraisal, meaning that they search for new appraisals of the stressor or new resources that would decrease the discrepancy;
  - use either problem-focused coping (which involves efforts to manage or change the cause or source of the stressor) or emotion-focused coping (which involves strategies to attend to our emotional responses to the stressor) strategies that would decrease the discrepancy;
  - decide their coping resources are inadequate and therefore experience ‘stress’ and experience a stress response.

3. What role does the environment play in stress? The individual?
Explanation should demonstrate understanding that:

- stressors may have an internal source (i.e. within an individual) or external source (i.e. outside the individual from situations and events in the environment);
- stress involves an encounter (‘transaction’) between an individual and their external environment;
- stress is not a result of the individual alone or the environment alone:
  - the environment can influence the individual, and
  - the individual can also influence the environment.

4

a What does appraisal involve?

Explanation should demonstrate understanding that:

- appraisal involves cognitively ‘weighing up’, or making an assessment/judgment about, the relative significance/importance of a particular situation or event;
- appraisal is not necessarily a conscious process, e.g. someone might feel a little ‘on edge’ and experience stomach aches and other reactions associated with a stress response a few weeks before an important exam, which is well before they have begun to consciously think about preparing for it;
- appraisal is also a highly subjective and personal process in that, two people may appraise exactly the same situation entirely differently, e.g. one person may find speaking in public to a large group of people highly stressful, whereas another may find it enjoyable and challenging.

b Name and describe the two major types of appraisal, according to Lazarus and Folkman.

- primary appraisal: evaluating, or judging, the significance of a stressor, resulting in a decision about whether the stressor is: (a) irrelevant (b) benign-positive or (c) stressful;
- secondary appraisal: evaluating coping options and resources and options for dealing with the stressor.

c What is the role of reappraisal and when might it occur?

- Reappraisal results in a changed / new appraisal of the stressor on the basis of new information.
- Reappraisal is simply another appraisal that follows an earlier appraisal, so it might therefore occur after the secondary appraisal of an earlier stressor or after taking into account the coping resources that are available.

5 Name and describe the three types of appraisal that follow an appraisal of a stimulus as stressful.

If a stressor is appraised as being ‘stressful’, the person then engages in three additional types of appraisals:

i harm-loss: an assessment of how much damage as already occurred;

ii threat: an assessment of harm/loss that may or may not yet occurred but could occur in the future;
iii challenge: an assessment of the potential for personal gain or growth from the situation.

6 a Explain the meaning of coping in relation to a stress response.

Explanation should demonstrate understanding that:

• coping is the process of constantly changing cognitive and behavioural efforts to manage specific internal and/or external stressors that are appraised as taxing or exceeding the resources of the person;

• coping requires the individual to ‘do something’ (i.e. make cognitive or behavioural changes) to address the stress response;

• if a person has effective coping skills, a stressor may not lead to stress or their stress response will be short-lived and/or less severe;

• coping can therefore mediate a person’s stress response.

b Name and describe the two types of coping with reference to three examples of each type.

• problem-focused coping: involves efforts to manage or change the cause or source of the stress i.e. the stressor. It targets the source/causes of stress in practical ways, e.g. finding out more information about the problem, learning a new skill to manage the problem, weighing up pros and cons of different options for dealing with the stressor.

• emotion-focused coping: involves efforts to deal with/reduce the emotional response to the stressor such as fear, anxiety, depression, embarrassment, excitement and frustration, e.g. looking on the ‘bright side’, seeking emotional support, ‘letting off steam’ to other people, engaging in physical exercise, meditating, distracting oneself by chatting to friends on Facebook.

c For each of the following statements, name the type of coping strategy that is being used to manage the effects of a stressor.

• I talk to someone about how I feel—emotion-focused
• I try to come up with a strategy about what to do—problem-focused
• I look for something good in what is happening—emotion-focused
• I focus on my school work to take my mind off things—emotion-focused
• I let my feelings out—emotion-focused
• I learn to live with it—if learning a new skill to manage the stressor, then problem-focused; if not involving any practical strategy, then emotion-focused

d A friend is experiencing a stress response after submitting a SAC for two VCE subjects in the morning. Shortly after, he learns that a SAC test will be held in five days for a third subject and will therefore clash with a 700-word SAC essay for a fourth subject, which must be submitted on the same day. Describe a problem-focused strategy or strategies that you believe could be effective for managing your friend’s stress response.

The goal of problem-focused coping is to reduce stress by managing or changing the source of the problem. The ‘problem’ is that there are two equally important things (the SAC test and the SAC essay) that both need to be attended to within the next five days.

Problem-focused strategies could include:
• setting up a study plan (timetable) that allows the friend to analyse their available time over the next five days to dedicate to school work, and to allocate appropriate amounts of that available time to studying for the SAC test and completing the SAC essay;
• breaking up both task into manageable parts with achievable sub-goals tied to deadlines;
• seeking additional help from the teacher or a tutor on the essay topic or in any weak areas that could potentially be covered on the test;
• making flash cards with definitions of key terms likely to be on the test and asking a friend or relative to use them in asking practice questions.

7 Outline the main strengths and limitations of the transactional model of stress and coping.

Strengths include:
• emphasises the importance of cognitive appraisal in determining the stress response;
• emphasises the ‘active’ role individuals have in the stress process as opposed to the ‘passive’ one they play according to physiological models, e.g. GAS;
• emphasises the personal and individual nature of cognitive appraisal and this helps explain why different individuals respond in different ways to the same types of stressors;
• the inclusion of a ‘reappraisal’ process allows for the fact that stressors and the circumstances under which they occur can change over time;
• the inclusion of ‘coping’ methods has enhanced understanding of the importance of stress-management strategies.

Limitations include:
• the model is difficult to test through experimental research because of the subjective nature, variability and complexity of individual responses to stressful experiences;
• primary and secondary appraisals can interact with one another and are often undertaken simultaneously not sequentially as the model suggests;
• it is questionable whether we really need to cognitively and consciously ‘appraise’ something in order to have a stress response.
Learning Activity 13.7 (p. 526)

Visual presentation on the transactional model of stress and coping

Construct a flow chart or another type of diagram that shows appraisals of a stressor resulting in a stress response, as explained by the Lazarus and Folkman transactional model of stress and coping. The diagram should demonstrate a response to a stressor of your choice, and include relevant examples of appraisals of the stressor and different types of coping strategies for the stressor.

Learning Activity 13.9 (p. 537)

1. Explain, with reference to an example, how lifestyle change and cultural change can either exacerbate or alleviate the stress response.

Lifestyle change:

- Holmes and Rahe (1967) believed that any change that requires an individual to change (adjust) their lifestyle can exacerbate the stress response in varying amounts, depending on the stressor and the level of lifestyle change (‘social adjustment’) required. Holmes and Rahe found that the more lifestyle change required, the more prone a person is to physical and psychological stress-related illness or disease. They argued that the stress response
can be exacerbated by both negative (e.g. death of a spouse) and positive (e.g. marriage) events.

- Other research, however, has proposed that lifestyle change can also alleviate the stress response. For example, a marriage that is characterised by conflict, tension and unhappiness would be exacerbating a person’s stress response. For this individual, however, getting divorced might actually be less stressful than remaining married, so divorce might actually have the effect of alleviating their stress response.

Cultural change:

- For immigrants, refugees and asylum seekers coming to Australia and other countries, departure can be a means of escaping famine, poverty, torture, persecution, civil unrest, political turmoil or war. Therefore, in these circumstances, cultural change can serve as a means of alleviating the stress response.

- Conversely, if there are significant differences between the persons country of origin and the new dominant culture in terms of the values, customs, their socio-economic status and the language spoken, cultural change may exacerbate a person’s stress response (‘acculturative stress’). The stress response may be exacerbated even further if the cultural change also results in the individual experiencing racism (‘racism-related stress’).

2

a Explain how crowding can exacerbate the stress response.

Explanation may refer to:

- Crowding refers to the feeling of being cramped, of having less space than preferred.

- In much the same way as people evaluate and interpret stressors, crowding can also be a subjective experience (as it can arise in low population density situations) and can be the result of an appraisal of physical conditions, situational variables, personal characteristics (e.g. an introvert may easily feel crowded in a situation that an extrovert finds socially enjoyable), an individual’s sense of personal control, the length of time spent in the crowded situation and coping resources.

- Crowding can exacerbate the stress response because in crowded conditions resources may be limited or become scarce (e.g. food, water), there may be an increase in the spread of certain diseases, the activities of one person may interfere with the activities of another person, unavoidable interpersonal interaction may distract the individual or may prevent the individual from attaining his or her personal goals, and frequent violations of personal space may increase physiological arousal (e.g. high blood pressure, increased heart rate etc.).

- There is evidence that conditions of high population density can cause a breakdown in social behaviour and physiological functioning (Calhoun, 1962).

b Suggest a way that crowding could alleviate the stress response.

Examples:

- Crowding could alleviate the stress response if a person is stressed as a result of social isolation/loneliness.

- Crowding could alleviate the stress response in a situation where a person arrives at another person’s house (who they don’t know very well) for a BBQ, only to find that
they are the only one there. This situation could trigger a stress reaction which could be alleviated as crowding increases, i.e. as more and more people arrive for the BBQ.

- Crowding could alleviate the stress response in a situation where two people have been set up by friends on a blind date at a restaurant. When they arrive, they discover they are the only ones in the restaurant. Consequently, the waiters are overly attentive and the restaurant is extremely quiet (i.e. no ‘atmosphere’ or background noise). This situation could trigger a stress reaction in one or both of the people. Their stress reactions could be alleviated as crowding increases, i.e. as more and more people arrive at the restaurant, thereby providing more ‘atmosphere’, background noise and giving the waiters other customers to attend to.

3 Briefly describe the relationship between social, cultural and environmental factors and explain why factors from each domain are difficult to isolate and study independently.

Description should demonstrate understanding that:

- it is difficult to draw a clear line between social, cultural and environmental factors as they overlap, interact and typically combine in influencing a person’s stress response, e.g. a person’s culture is shaped by their environment, a person’s culture influences their social interactions, the environment influences a person’s social interactions and so on; and

- a stressor may therefore incorporate elements from each of these domains and it is difficult to isolate or ‘tease out’ which of the elements had the most significant impact on the person’s stress response.

4

a Explain, with reference to an example, how social, cultural and environmental factors can interact to influence the stress response.

Examples include:

- Amir is experiencing a stress response due to his emigrating to Australia from Iran—he is working nights as a cleaner in a hospital because his civil engineering qualifications have not been recognised in Australia (cultural factor), he is experiencing racism (cultural factor), and he is also experiencing social isolation (social factor).

- Marek is experiencing a stress response—he has moved to Australia from Poland (cultural factor) and left all his family behind (social factor). He is finding the 40+ degree heat in the Australian summer incredibly difficult to cope with (environmental factor), he speaks no English, is finding it difficult to communicate with others (cultural factors), is finding it difficult to make new friends (social factor) and doesn’t know any other Polish people (social/cultural factors).

b Draw a diagram (for example, a concept map) that shows how these factors can interact to influence the response to a stressor.

Example:
Learning Activity 13.10(p. 542)

1. Explain the meaning of allostasis with reference to an example.

Allostasis is the body’s ability to maintain a stable physiological environment by adjusting and changing to meet internal and external demands.

Examples will vary between students but should include a component of one of the allostatic systems, namely the HPA axis, the autonomic nervous system, the immune system, the metabolic system and the cardiovascular system.

Example of blood pressure: blood pressure is not constant throughout the day and operating within a narrow range, but instead it shows wide and systematic fluctuations associated with the circadian cycles of sleep and waking and with varying diurnal patterns of activity throughout the day (e.g. during physical exercise). This type of allostasis helps to maintain oxygen tension in the brain and makes it possible for the individual to function in response to a changing social and physical environment.

2. What are the similarities and differences between allostasis and homeostasis?
Similar:

- Both help the body achieve physiological stability by maintaining a stable internal environment.

Differences:

- Homeostasis helps the body achieve stability by staying the same (‘stability through constancy’), whereas allostasis helps the body achieve stability by changing (‘stability through change’).
- Homeostatic systems must be maintained within narrow ranges of functioning, whereas allostatic systems have wider ranges of functioning.
- Homeostatic systems are essential for life, i.e. large deviations in processes regulated by homeostatic systems (such as blood oxygen and pH levels) can lead directly to death, whereas large variations in processes regulated by allostatic systems, although critical to survival, do not lead directly to death.
- Homeostatic systems have an optimal range of functioning (a stable ‘set point’), whereas there is no ‘optimal range’ for allostatic systems (what is ‘optimal’ is defined by the demand/need).

3

a What is an allostatic system?

Allostatic system is an internal, bodily, regulatory system that acts (or ‘changes’) to protect the body by responding to internal and external stimuli.

b List the main allostatic systems.

- HPA axis
- autonomic nervous system
- immune system
- cardiovascular system
- metabolic system

c What role do allostatic systems have in allostasis?

Explanation should demonstrate understanding that:

- the body responds to challenge (e.g. threat, an infection, a crowded or noisy neighbourhood, having to give a speech in public) by ‘turning on’ an allostatic response, thus initiating a complex pathway for adaption and coping, and then ‘shutting off’ this response when the challenge has passed;
- this ‘inactivation’ returns the allostatic systems to normal;
- allostatic systems therefore enable an individual to adapt to the demands of stressors by initiating and supporting a state of physiological arousal which is then ‘shut off’ when it is no longer needed.

4

a Explain the meaning of allostatic load.
Allostatic load is the ‘wear and tear’ on the brain and body due to cumulative exposure to allostatic changes over a period of time.

b What causes allostatic load?

Explanation should refer to:

- allostatic load occurs with increased frequency of exposure to stressors, increased intensity of these stressors or decreased efficiency in coordinating the onset (‘turning on’) and termination of (‘turning off’) the allostatic response;
- repeated cycles of allostatic changes over a period of time
- exposure to increased secretion and presence of stress hormones over a period of time
- i.e. allostatic load occurs with increased frequency of exposure to stressors, increased intensity of these stressors or decreased efficiency in coordinating the onset (‘turning on’) and termination of (‘turning off’) the allostatic response
- stressors can trigger a chain (sequence) of physiological changes that result in allostatic load (which in turn can lead to serious health consequences) e.g.

c In what way is allostatic load ‘the price we pay’ for repeatedly being challenged by a variety of stressors?

Explanation:

- The way our bodies work presents us with a paradox: what can protect us can also damage us.
- In the short term, allostasis is an adaptive and protective process that helps the body maintain a stable physiological environment, however, allostatic changes over long periods may result in ‘wear and tear’.
- The human body is very adaptable, but it cannot maintain allostatic load and tolerate any level of stress for any length of time (just because the environment calls for it) without serious health consequences (such as impairment in immunity, cardiovascular and metabolic function); for example, if an individual with hypertension continues to be stressed, obese, does not exercise and eats a diet high in fat and salt, their body systems will eventually wear out.
- The ‘price we pay’ therefore refers to the notion that our allostatic systems (HPA axis, cardiovascular, metabolic and immune systems) are at risk of damage if they are constantly forced to adapt to chronic or repeated stressors.
• This is not dissimilar to the washer on a tap wearing out if it is constantly and forcefully turned on and off—it will eventually wear out from over-use.

5 How does allostasis integrate biological, psychological and social factors to explain an individual’s response to stress?

• See figure 13.22 (p. 541)
• Sterling and Eyer’s (1988) allostatic model adopts the perspective of the biopsychosocial framework by explaining the stress response in terms of the combined interaction of our body’s physiological responses (‘bio’), our appraisal of the situation in determining whether allostatic systems are activated and when they should be turned off (‘psycho’), as well as the social context (‘social’).
• Our appraisal (‘psycho’) of a potential stressor (biological, psychological or social factor) will determine whether the HPA axis and systems involved in an allostatic response are activated or not (‘bio’). If the allostatic response is activated, the brain will detect and regulate bodily processes and determine how quickly they will return to their normal levels (‘bio’), taking account of the stressor and the context (psycho-social).

Learning Activity 13.12 (p. 549)

1

a Explain the meaning of biofeedback.

Biofeedback is a technique that enables an individual to receive information (‘feedback’) about the state of a bodily (‘bio’) process.

b What is a key assumption underlying the use of biofeedback for coping with effects of stress?

It is possible to learn to consciously control/gain control over certain bodily reactions/processes under the control of the self-regulating ANS and which therefore normally occur involuntarily, e.g. heart rate, blood pressure, muscle tension, skin temperature.

c Give an example of the use of biofeedback for coping with effects of stress.

Examples:

• An individual could decrease their heart rate by using visual imagery to imagine a stress-free tranquil scene, while they are obtaining feedback about their heart rate.

• An individual could reduce the muscle tension causing tension headaches by using the feedback provided by an EMG to relax shoulder, neck and facial muscles.

2

a What is meditation?

Meditation is a specific technique that involves altering one’s state of consciousness by focusing attention or thoughts on a signal internal stimulus.

b What is relaxation?
Relaxation is the process of bringing about a state of reduced psychological and/or physiological arousal e.g. lower heart rate, slower breathing rate and loss of muscle tension.

c What are the differences between relaxation and meditation?

Differences include:

- when someone is meditating, they are in a state of consciousness that can be considered to be different from a normal waking state – this is not necessarily the case with relaxation unless induced through meditation
- when someone is meditating they are inward focusing and not focusing on their environment – whereas when someone is relaxed they are still aware of their external environment
- relaxation can be achieved using a wider variety of activities or methods than meditation.

d In what way are relaxation, meditation and biofeedback similar?

Explanation may refer to:

- all three induce/result in a state of relaxation and calm (and reduce physiological arousal);
- all three involve a physiological state that is the opposite of stress response;
- all three address the physiological symptoms of a person’s stress response such reduce muscle tension, but they do not address the cause (or source) of the stress;
- all three are not biological or ‘medically based’, i.e. they do not involve the use of chemicals to achieve a relaxed state.

e Explain why meditation and relaxation can help alleviate effects of stress.

Explanation should demonstrate understanding that the state brought on by meditation and relaxation (i.e. when someone is in a relaxed or meditative state) is essentially the opposite of a typical stress response, e.g. being in a relaxed or meditative state can help alleviate the stress response because people typically report feeling calm, a low level or absence of anxiety and responses associated with a low level of overall physiological arousal such as a lower heart rate, slower breathing rate, and loss of muscle tension.

3

a Describe three potential benefits of physical exercise for coping with effects of stress.

Potential benefits may refer to:

- When an individual experiences stress, the sympathetic nervous system and HPA axis are activated, releasing the body’s stress hormones. Exercise uses up the stress hormones secreted into the bloodstream, thereby helping the immune system return to normal functioning sooner.
- Exercise can help ‘work out’ (release) tension that has built up in the muscles.
- Exercise increases the efficiency of the cardiovascular system and increases strength, flexibility and stamina for encountering future stressors.
Many people experience short term psychological benefits during or immediately after exercising, e.g. the release of beta-endorphins which can relieve pain, improve mood and increase a sense of wellbeing and relaxation.

b Briefly explain why aerobic exercise is considered to be more beneficial than anaerobic exercise for coping with effects of stress.

Explanation should demonstrate understanding that:

- aerobic exercise requires a sustained increase in oxygen consumption and promotes cardiovascular fitness, whereas anaerobic exercise involves short bursts of muscle activity that can strengthen muscles and improve flexibility (aerobic means ‘with oxygen’ and anaerobic means ‘without oxygen’);
- individuals who engage in regular aerobic exercise have high levels of fitness and are able to reduce their anxiety levels and cope with stress more effectively;
- unlike anaerobic exercise, aerobic exercise can improve circulation and consequently lower blood pressure, strengthen and enlarge the heart muscle (which in turn boosts its pumping efficiency and lowers resting heart rate), and reduce the risk of cardiovascular disease;
- aerobic exercise uses up the stress hormones secreted into the bloodstream, thereby helping the immune system return to normal functioning sooner.

**Learning Activity 13.13 (p. 551)**

1. Explain the meaning of social support with reference to an example of social support available at your school.

   Social support is help/assistance from other people when needed.
   
   Examples include: help from close friends, peers at school, teachers we trust, the school counsellor/student welfare coordinator.

2. Name and describe the four forms of social support.

   - appraisal support: help from another person that improves the individual’s understanding of the stressful event and the resources and coping strategies that may be needed to deal with it (e.g. helping a friend review and evaluate a failed strategy for dealing with a stressor);
   - tangible assistance: the provision of material support, such as services, financial assistance or goods (gifts), doing a job or chore, that may help offset the effects of a stressful event (e.g. giving food to someone who has experienced a bereavement and may not have the energy to cook a nutritious meal for themselves);
   - information support: the provision of information or advice about how to cope with the stressful event, gathering and sharing information and giving feedback about how a person is doing (e.g. explain where to get help, giving directions, showing how to do something, giving feedback as to one’s appearance, behaviour etc.);
   - emotional support: provision of reassurance, care, and being able to rely on and confide in a person which contributes to the feeling that one is loved and cared about (e.g. hugs or pats on the back, as well as listening and empathising without passing judgement).
Consider the following examples of social support that could potentially alleviate stress for someone who has just been informed that they have a terminal illness. Name the form of social support provided in each example.

- offering hope and encouragement that ‘things will work out fine’: emotional support
- listening to the person’s concerns and offering advice: information support; possibly appraisal support
- giving money to pay for home care: tangible assistance
- providing a Cancer Council brochure: information support
- providing a cooked lasagne: tangible assistance
- providing the website address for a cancer hospital: information support
- offering compliments that boost the person’s self-esteem: emotional support
- bringing a comedy DVD and some popcorn to the person’s house and watching the DVD with them: tangible assistance and emotional support
- participating in a cancer support group: emotional support; possibly appraisal support and information support
- providing assistance to work out an action plan for hospital visits: appraisal support

**Learning Activity 13.15 (p. 551)**

Visual presentation on stress coping strategies

Using an example of a potential stressor at school, college or in the workplace, construct a concept map in which you show potential strategies for coping with stress, including biofeedback, meditation, relaxation, physical exercise and social support, and give relevant examples of each strategy. For each example, include key words indicating how it may alleviate stress. See next page.
ABBY I S STRESSED – IF SHE DOESN’T DO WELL ON HER EXAMS, HER PARENTS ARE TAKING HER OUT OF THE SCHOOL

**Biofeedback**
_With the help of feedback from sensors, Abby could use her thought processes to control a physiological response e.g. reduce muscle tension_

**Social support**
_Abby could seek help or assistance from other people_

**Physical exercise**
_Abby could engage in physical activity:
* aerobic exercise, e.g. running, swimming
* anaerobic exercise, e.g. lift weights at the gym, do push-ups, calisthenic exercises_

**Meditation and Relaxation**
_- Abby could engage in an activity that reduces psychological and physiological tension_
_- Abby could intentionally bring about a deeply relaxed state by focusing on a single stimulus_

control physiological responses
friends—
emotional support
teachers—
study techniques
teachers—
tangible assistance, practice exams
watch TV, read a book, play Nintendo DS
slow breathing/
relax muscles
refocus attention on single word/
breathing
aerobic fitness reduces anxiety
improve physical health
improve psychological wellbeing
apply learned techniques
refocus attention
refocus attention
improve physical
health
improve psychological
wellbeing
control physiological responses
friends—
emotional support
teachers—
study techniques
teachers—
tangible assistance, practice exams
watch TV, read a book, play Nintendo DS
slow breathing/
relax muscles
refocus attention on single word/
breathing
aerobic fitness reduces anxiety
improve physical health
improve psychological wellbeing
apply learned techniques
refocus attention