**Literature review- The use of creatine supplementation**

Creatine phosphate is an energy-rich compound that supplies energy to cells in the body, primarily, an energy source for muscular contraction. Muscular work relies on creatine phosphate breaking down to creatine and phosphate, and releasing energy in the process. The energy is used to drive free phosphate back to ADP so it can once again become a triple phosphate. Once reformed, ATP can break down again-and so the energy production process continues. Although the human body can naturally manufacture creatine, many athletes also utilise creatine supplementation. Creatine supplements are athletic aids utilised to increase high-intensity athletic performance and were popularized as a performance-enhancing supplement in the early 1990s. The purpose of this review is to investigate the use of creatine supplementation.

A consistent them identified in the literature is the increased performance and muscle size creatine supplements have on the body. ‘creatine has been recognised as a product that delivers on its promise of improved strength’ (Robson, 2006). Robson (2006) identified the following benefits of ………….creatine supplement benefits and Robson (2006)describes that creatine supplements are one of the most heavily researched supplements in the history of sports nutrition, underpinning their potential positive effect on performance and muscle enhancement. In agreement Zelman (year published) confirmed that creatine’ ability to enhance muscle mass and help athletes achieve bursts of strength. Although Zelman positively describes the benefits of creatine supplements, like increased lean muscle mass, bursts of speed and energy, she does however state that there is no evidence that creatine helps with endurance sports (Zelman , 2012). Risher (2013) in a Men’s Health magazine article also explores the theme of creatine supplements effects on muscle mass by promoting them as a way to get ‘bigger and stronger, faster’ detailing that with more energy, you can train harder and more often, producing faster results (Risher, 2013). This idea is again addressed in the final article reviewed written by Racer development cooperation which describes how supplements are widely used for strength enhancement and consistent with the other literature, specifically identifies how it should be used by only a selected group of athletes and at the correct dosage (Racer Development Coorperation, 2011). The literature confirms that overall trend throughout the articles regarding increased performance and muscle size is that if used for the correct purpose, such as weight lifting or body building, it has benefits and will indeed increase ones performance and muscle mass if used in the right way by the right people.

Although literature on creatine supplements can be quite convincing on its benefits, it should be recognised that research is still limited in certain areas. Zelman(2012) described that research on creatine has been mixed and stated further that there is no evidence that creatine will help with endurance sports.,. The long term effects of taking creatine supplements, particularly in young people is still unknown (Zelman , 2012). As stated by Risher (year) children are still in a growing phase, and they are still not sure what impact creatine may have on muscles and bones as they grow and that it is felt that middle and high schooler should not use it. This uncertainty again reflects the need for further research into the effect of creatine supplements on young people. Evidently these supplements lack particular research into the long term effects on young people, and it can be viewed as unsafe to utilise them when these factors are still unknown. Although there has been very little research conducted in children under the age of 18, the great popularity among young people of these supplements is still significant, questioning the safety of marketing these to an unregulated group. Of those studies, a few have suggested a positive effect, but the overall evidence is inconclusive (Zelman , 2012). It is overall questioned whether or not it is right to introduce a supplement to the body’s well balanced metabolic structure when long term use is still unknown (Racer Development Coorperation, 2011).

The use of creatine supplements have been positively documented throughout literature and has been described as ‘one of the safer supplements to take’ (Robson, 2006), however potential side effects and negatives of this supplement should be addressed. Zelman identifies the side effects of the supplements, including weight gain, anxiety, breathing difficulty, nausea, vomiting and kidney problems and how “certain drugs including diabetes medication, acetaminophen, and diuretics, can have dangerous interactions with creatine, and that taking stimulants such as caffeine and ephedra with creatine can increase the risk of side effects” (Zelman , 2012). There seems to be a clear contraindications of creatine supplements with specific medical conditions and interactions with other medications (Cee, 2013). Cree (2013) stated that there is indications that creatine supplementation can adversely interact with other medications. Although most healthy people can take creatine with no problems, it can, in rare cases, have adverse effects particularly when used in excess (Cee, 2013). The literature (cite all authors and years published) confirm common side effects of creatine supplementations demonstrating the potential danger of taking creatine supplements without the correct understanding of its use.

Creatine supplements are easily accessible in chemists, health food shops, supermarkets and online and access is unregulated by health practitioners. With this information a major point that is drawn from this is the lack of regulation in the sales of creatine supplement products and illustrates the need for medical consultation before taking any creatine supplements particularly when consideration is given to all the possible contraindications to its use. With these findings, it is worth considering whether creatine supplementation should be available without appropriate regulation from places such as supermarkets or online were they can be accessed by anyone, including adolescence. If there is evidence on the various negative side effects of creatine supplementation and the significant risks it may pose on people with kidney or liver disease, or diabetes, it is questioned whether it is right and safe to have it at such easy access. (Zelman , 2012). Jenna Cee who wrote the article ‘Is creatine bad for you?’ 2013, states that creatine is ‘neither “good” or “bad” for you’ and that it is considered safe when used at the directed or recommended dosages under medical guidance, thus highlighting the importance of its regulation under medical consultation which is similarly reflected in the first article by Kathleen Zelman.

In conclusion, creatine supplementation can have a positive physiological use and level of effectiveness within the body, for example an increase in performance and muscle mass, as long as it is utilised correctly by the right people. Although the benefits within these specific groups such as body builders, weight lifters and sprinters are clear, the risks of creatine supplementation are significant and potentially dangerous if used incorrectly. The long term effects of the supplements still remain predominantly unknown and are poorly researched. An important factor that can be drawn from the literature is the identification of the need for specific dosing to suit each athletes requirements and the limiting of the supplements to just a specific target group that would benefit for example those in strength training, body builders and weight lifters. In saying this it can be acknowledged that there is a very large percentage of people who may use creatine supplements and not necessarily benefit from them and in fact could be at risk of side effects from the consumption of them. The overall conclusion is that creatine supplements can effectively enhance performance for a selected group of athletes however it is acknowledged that there is a need for better regulation of creatine supplements under medical supervision and the possible benefits of withdrawal of them from an easily accessible market such as supermarkets, chemists and numerous online stores, where uninformed individuals may purchase the product with little knowledge of its place in bodily function.

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