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Principal Air Pollutants and Their Effects on Athletes' Health and Performance: A Critical Review

Gashaw Tesema1 & Yitayal Addis Alemayehu2

Lecturers of Sport Science, Kotebe University and Mizan Tepi University

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Abstract

The aim of this review is to assess the health effects of the criteria air pollutants: Sulfur dioxide (SO_2), carbon oxides (CO_X), nitrogen dioxide (NO_2), particulate matter (PM) and ozone (O_3) together with photochemical smog and global warming in relation to exercise with particular focus on athletes. In this review respiratory and cardiovascular health impacts of the specified principal air pollutants have been critically seen. It will also give information about ambient air quality standard to estimate air quality and take appropriate measure for training athletes according to US Environmental protection agency. The effect of photochemical smog have been discussed as a result of the synergistic effect of ozone (O_3), nitrogen dioxide (NO_2), volatile organic compounds (VOCS) and peroxyacetyl nitrate (PAN). Wide spectrum illness that arises from global warming that needs precautions have been seen precisely in this review. In general this review will provide sound information for athletes, coaches, managers, sport medicine team, health community as well as other concerned bodies.

Introduction

Pollution now a day is the main problem in the world. This issue has always been the agenda of every one for those who concerned for the health of the world. Some areas of the world are in the worst pollution which exposed people to poor health even death. For example, in Russia - Dzerzinsk, 300,000 people, Norilsk, 134,000 people, In China Linfen, Shanxi province, 200,000 people, In Haina, Dominican republic 85,000 people, In India Ranipet, 3,500,000 people are potentially affected by Chemicals and toxic byproducts like Sarin, VX gas, Fly-ash, carbon oxides, Nitrogen oxides, $PM_{2.5}$, PM_{10}, volatile organic compounds, arsenic, particulates including Strontium-90, Caesium-137, Sulfur dioxide, heavy metals (nickel, copper, cobalt, lead, selenium), phenols, hydrogen sulfide (Blacksmith Institute, 2006). Most of these are air pollutants and such environmental pollution creates undeniable health impacts on human being.

WHO (2006), classified the health effects of air pollution in to two. The first one is the effects attributed to short-term exposure which includes: daily mortality, respiratory and cardiovascular hospital admissions, respiratory and cardiovascular emergency department visits,

respiratory and cardiovascular primary care visits, use of respiratory and cardiovascular medications, days of restricted activity, work absenteeism, school absenteeism, acute symptoms (wheezing, coughing, phlegm production, respiratory infections) and physiological changes (e.g. lung function). The other category is effects attributed to long-term exposure such as: mortality due to cardiovascular and respiratory disease, chronic respiratory disease incidence and prevalence (asthma, COPD, chronic pathological changes), chronic changes in physiologic functions, Lung cancer, Chronic cardiovascular disease, Intrauterine growth restriction (low birth weight at term, intrauterine growth retardation, small for gestational age).

Both of the short and long term respiratory and cardiac impacts have been linked to air pollution and exercise intensity (Mroszczyk, 2012) and yet elite athletes are rarely aware of the health risk associated with training or competing in an environment with poor air quality. For example, Cutrufello *et al*. (2012), Singh (2013) and Spitz (2014) reported that about 2 million deaths per year may be attributed to air pollution. It is the main cause of cardio respiratory infection especially for special populations like active individuals and sports men due to speedy and high consumption rate of gas in inhaled air.

The volume of air inspired or expired with each normal breath (tidal volume) is about 500 ml in the adult male. But in women pulmonary volumes and capacities are about 20-25% less than men, and they are greater in large size and athletic people than in small size and inactive people (Guyton, 2006).

The metabolic demands of exercise increase minute ventilation and therefore the rate of inhalation of pollutants increase. The type of sport that the athletes involved has also different exposure potential for polluted air. For example, summer Olympic sports (triathlon, running, cycling, soccer, rowing, tennis, and swimming), Winter Olympic sports (Cross-country siiking, downhill siiking, hockey, figure skating, and speed skating) and Paralympics are sports with the highest potential exposure to poor indoor or outdoor air quality (Piturro, 2008).

In this connection, athletes become at high risk of inhaling polluted air because of two major reasons. The first one is the 10 to 20 times (NFHS, 2011) or 10 to 15 times (Kargarfard *et al.*2009; El-Hadedy and Zaiton, 2012) increase in inspiration of the normal volume of air per minute during exercise and increased velocity of respiration exposes them to air pollutants. For comparison, the typical inactive individual inhales about 600 liters of air each hour. During exhaustive activity, however, the volume can be as high as 7,000 liters (Bonini *et al*., 2006). This implies that exercise in polluted air greatly increases lung surface contact with airborne pollutants. The second is that athletes could breathe in mouth than in their nose (El-Hadedy and Zaiton, 2012). Breathing through the nose filter some percent of inhaled pollutants, but during exercise air intake usually comes

through the mouth that enables air pollutants more directly get in to the lungs. Apart from the health effect, polluted air decrease in the performance of athletes. For example, in a research done with 8 km running, the athletes' performance was significantly decreased in hot, humid and ozone-polluted condition (Elisa, 2009). Another study results by Kargarfard *et al.,* (2009) showed that there are significant decreases in all of the respiratory parameters: Expiratory reserve volume (ERV), Inspiratory capacity (IC), - forced expiratory volume in 1 second (FEV_1), Maximum voluntary ventilation (MVV), Forced vital capacity (FVC) of active individuals in polluted air compared with non-polluted air.

The prevalence of asthma can be taken as one form of risk in elite athletes. Its prevalence has been reported to range between 3.7% and 22.8% (Bonini *et al*., 2006) indicating that asthma and asthma-like symptoms seem to be more common in elite athletes compared with inactive individuals. Asthma is most commonly found in athletes performing endurance events such as cycling, swimming, or long distance running (Bonini *et al*., 2006; Helenius, 2000). According to Helenius (2000) asthma risk is closely associated with atrophy and its severity. When the two risk factors, sporting event and atrophy, were combined in a logistic regression model, the relative risk of asthma was 25-fold in an atrophic speed and power athlete, 42-fold in an atrophic long-distance runner, and even 97-fold in atrophic swimmers compared with non-atrophic controls (Helenius, 2000). Olympic cyclists, who spend many hours training on the road and, who are often exposed to PM, NO_X and ozone (O_3) have a high prevalence of asthma (17%) (Fitch, 2012; Kippelen *et al*., 2012).

Generally, results of reports indicate that even a brief acute exposure to moderate levels of air contamination may promote modest but significant physiological abnormalities in clinically healthy young adult individuals during exercise (El-Hadedy and Zaiton, 2012). Athletes like that of asthmatic individuals, infants and elderly people; are potentially sensitive populations with respect to inhalation of ambient air pollutants that greatly increase their dose of gaseous or particulate air pollutants through increased ventilatory rate (Carlisle and Sharp, 2001; Kim *et al*., 1991; Singh, 2013). A study by Das and Chatterjee (2013) in its part reported that there exists significant negative correlation between air pollutant parameters and hemoglobin concentration. This is to mean that inhalation of polluted air adversely affects hemoglobin concentration and this effect is pronounced in active individuals like athletes.

Ambient Air Quality Standards

The Air Quality Index (AQI) is the national standard method for reporting air pollution levels. An index such as the air quality index (AQI) is necessary because there are several air pollutants, each with different typical ambient concentrations and each with different levels of harm, and to

report actual concentrations for all of them would be confusing (Illinois, 2012).

For example, the U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) for six principal air pollutants (criteria air pollutants) considered harmful for public health: Sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM), ozone (O_3), and lead. Some of these pollutants, such as PM, are commonly associated with increased incidence of asthma, decreased lung function and cardiovascular complications, while others affect health in different ways like effects of lead on the developing nervous system (Jeffrey, 2014).

Table 1. **Pollution standard index (PSI)**

Index value	Air quality index (AQI)	Color
Up to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups*	Orange
151 to 200	Unhealthy	Red
201 to 300	Very unhealthy	Purple
> 301	Hazardous	Maroon

(US EPA, 2000; Chen, 2013); * Refers to asthmatics, allergic and active people.

Researchers in the area measured high polluted and low polluted atmospheres based on the EPA criteria air pollutants and Table 1 and the results are reported as shown in Table 2:

Table 2. Pollutant characteristics in polluted and low polluted atmosphere

Pollutants/Characterstics	low polluted	high polluted
Humidity (%)	48.5	49.5
Temperature (^{0}C)	9.8	9.6
Altitude (m)	1626	1600
Carbon monoxide, CO (ppm)	2.4	35.4
Ozone, O_3 (ppb)	1.6	10.1
Particulate matter, PM_{10} (ppm)	20	248
Nitrogen dioxide, NO_2 (ppb)	18.3	45.4
Sulphur dioxide, SO_2 (ppb)	18.2	46.9
Pollution standard index (PSI)	< 50	> 200

(Kargarfard *et al*., 2009, 2011).

Thus, according to the report, the PSI of the highly polluted atmosphere is > 200 (Table 2) which means it is very unhealthy (Table 1). High level of air pollutants may lead to decrease in the maximal oxygen consumption (VO_2 max) which could be because of low level of oxygen transport from the pulmonary alveoli (Brook *et al*., 2010, Liux *et al*., 2008, Olivera *et al*., 2006). The most common air pollutants are: carbon monoxide, nitrogen oxides, sulfur oxides, particulate matters with a diameter of less than 10 um (PM_{10}), and ozone (Table 1).

The aim of this review is therefore, to assess the health and performance effects of sulfur dioxide (SO_2), carbon oxides (CO_X), nitrogen dioxide (NO_2), particulate matter (PM) and ozone (O_3) and global warming in relation to exercise with particular focus on athletes.

Effect of Principal Air Pollutants and Their Interaction in the Body

Particulate Matter

report actual concentrations for all of them would

Particulate matter (PM) includes soluble or insoluble solid and liquid materials present in the

Table 2. Pollutant characteristics in polluted and

air in the form of particles which are small enough (less than 10 µm) to remain in suspension for some hours or days (WHO, 2003). Particles less than 10 µm (PM_{10}) are capable of entering the respiratory tract and reaching the deeper parts of the lung up to alveoli, and deposited if less than 2.5 µm ($PM_{2.5}$) in diameter. However, particles of diameter less than 0.5 µm ($PM_{0.5}$) are least likely to be deposited in the respiratory tract, as they are too small to either impact on, or diffuse in to, the walls effectively and are exhaled before they can be deposited (Manhan, 2003; WHO, 2003). Sulfate, mineral dust (including trace elements), nitrate, Black carbon as well as black smoke leads to the accumulation of total suspended particulates, and they are the main contributors for the deposition of PM_{10} and $PM_{2.5}$ (WHO, 2003).

Such deposition is exacerbated by exercise. For example, a comparison study conducted between rural and inner city areas indicate that personal exposure to PM of people exercising at the roadside in the city is higher than that of the sedentary person and those exercising in rural locations and significant health and performance effects have been seen on athletes' in the city (Carlisle and Sharp, 2001). Air polluted by car exhaustions, combustion of engines, especially freshly generated PM_{10}, is considered highly injurious to the airways, especially dehydrated and damaged airways are believed to be more vulnerable to the poisonous effects of PM_{10}, and PM_1 (Kippelen *et al*., 2012). Athletes respiratory tract becomes dehydrated during high intensity trainings which exacerbates the damage of both upper and lower respiratory tract due to PM. Among healthy athletes, it is generally reported that daily low-dose exposures to air pollution, and then PM, does not have any significant effect on short-term pulmonary function (Williams, 2011). Nonetheless, it is concluded that PM exposure and exercise on competitive athlete is still susceptible to pulmonary inflammation, decreased lung function, increased risk of asthma and decreases in exercise performance (Cutrufello *et al*., 2012; Spitz, 2014).

Carbon Oxide

Carbon monoxide (CO) emissions in urban areas now a day are greater than emissions of all other pollutants combined. The ability to generate prolonged energy depends on the extraction and transportation of oxygen to skeletal muscle for cellular respiration. However, the presence of CO can alter the ability of hemoglobin to bind and transport oxygen to cells because CO can compete with oxygen to the sites of hemoglobin (Hadgson, 2010). Consequently, hemoglobin will combine with CO to form carboxyhaemoglobin (COHb) and it has a 230 times greater affinity for CO than for oxygen (Singh, 2013). Finaly, CO puts its significant potential effect by altering the blood's carrying and transporting capacity of oxygen to body cells (Oliveira, *et al*., 2006; Singh, 2013).

The World Health Organization (WHO, 2000) calculated the relation between CO concentration and blood COHb for a lightly exercising subject. COHb values are reduced by a factor of two for a

person at rest and increased by a similar factor by heavy exercise like endurance athletes. Thus a heavily exercising subject can expect to have 1.6% COHb after one hour in 20 mg/L CO (Carlisle and Sharp, 2001). Levels of 2.7% COHb and upwards result in evidence of impaired behavior (Colls, 1997; Carlisle and Sharp, 2001). In an other study it is reported that exhaustive exercise performed for 30 minutes in high traffic areas is equivalent to smoking 10 cigarettes (Marr and Ely, 2010). Such prolonged exposure and exhaustive exercise to heavy traffic areas brought a 5% concentrations of COHb in the blood (Parminder, 2013). This implies that athletes should be warned not to do exercise in the area and time of high traffic.

Sulfur Oxides

Polluted air contains oxides of sulfur, commonly sulfur dioxide (SO_2) that results primarily from the industrial combustion of coal, with soft coal (pyrite) containing the highest levels of sulfur (Hadgson, 2010) and organically bound sulfur in coal and fuel oil (Manahan, 2003). These sources emit millions of tons of SO_2 to the global atmosphere annually and are largely responsible for acid rain (Manahan, 2003).

SO_2 tends to adhere to air particles and enter the inner respiratory tract, where they are not effectively removed (Carlisle and Sharp, 2001). In the respiratory tract, it combines readily with water i.e. 1 volume of water dissolves 45 volumes of SO_2 at 15 °C (WHO, 2006) to form sulfurous acid and then sulfuric acid resulting in irritation of mucous membranes and bronchial constriction (Manahan, 2003; Hadgson, 2010) by stimulating the vagus nerve (the tenth cranial nerve) in the pharynx region of the throat, behind the tongue (Kargarfard *et al*., 2009; Singh, 2013) where it resulting in reductions in forced expiratory volume (FEV1) or other indices of ventilatory capacity, increases in specific airway resistance, and symptoms such as wheezing or shortness of breath (Kim *et al*., 1991; WHO, 2000; Singh, 2013). Such effects are enhanced by exercise, which increases the volume of air inspired thereby allowing SO_2 to penetrate further into the respiratory tract (WHO, 2000; El-Hadedy and Zaiton, 2012). These effects in turn increases the sensitivity of the airway to other airborne toxicants (Hodgson, 2010), and enhanced if penetration to lower regions is increased through mouth rather than nose breathing and through exercise that raises the amount and depth of inhalation (WHO, 2000; Carlisle and Sharp, 2001; El-Hadedy and Zaiton, 2012). The minimum concentration evoking changes in lung function in exercising asthmatics is of the order of 4 mg/L. However, SO_2 begins to affect lung function in normal healthy adults at concentrations between 1 mg/L and 2 mg/L (Borresen, 2008).

Numerically, asthmatics are generally ten times more sensitive to SO_2 than non-asthmatics, especially when exercising. At concentrations of 500 ppb SO_2, exercising asthmatics experience pronounced changes (as much as 100%) in airways resistance after five minutes of exercise (Carlisle and Sharp, 2001). Thus, with the recommended air

quality standard for SO_2 being 0.1 mg/L (15 minute average) (Carlisle and Sharp, 2001), it is unlikely to have effect on athletes with normal lung function, but on asthmatics (Carlisle and Sharp, 2001; Borresen, 2008). It is also reported that a decreases in FEV_1 of 50–60% are observed in most exercising asthmatics exposed to 0.25 mg/L SO_2 (Folinsbee, 2001; Campbell *et al*., 2011). Subjects showed significant respiratory changes and asthmatic attacks with exposure to SO_2 at concentrations as low as 0.1mg/L for 10 minutes or longer (Campbell *et al*., 2011). SO_2 exposures in the range of 100–400 mg/L in air pose an immediate danger of death (National Academies, 2004; Borresen, 2008). Lower concentrations (<40 mg/L), however, have been associated with death in specific incidents (Borresen, 2008). In addition to lung effects, cardiovascular, gastrointestinal, neurological, and hematological effects have been observed in humans exposed to SO2 by inhalation (National Academies, 2004). For example, human, non-asthmatic subjects exposed to 1–8 mg/L SO_2 showed increased pulse rate which could be aggravated through exercise (Campbell *et al*., 2011). Therefore, SO_2 is clearly an important irritant for exercising asthmatics and may cause problems for the asthmatic athlete, but higher concentrations of SO_2, more than the quality standard 0.1mg/L for 15 minute average, could affect the non-asthmatic athlete.

Nitrogen Oxide

Nitrogen oxides (NOx) enter the atmosphere primarily as NO, produced in combustion processes from organically bound nitrogen endogenous to fossil fuels (particularly coal, heavy fuel oil, and shale oil) and from atmospheric nitrogen under the conditions that exist in an internal combustion engine, and photochemical processes in the atmosphere tend to convert NO to NO_2 (Manahan, 2003).

Nitrogen dioxide (NO_2), a gas found in photochemical smog, is also a pulmonary irritant and is known to lead to pulmonary edema and hemorrhage (Manahan, 2003). The main issue of concern is its contribution to the formation of photochemical smog and ozone, although nitrogen oxides also contribute to acid deposition (Hadgson, 2010). Inhalation of air containing 200 to 700 mg/L of NO_2 can be fatal (Hadgson, 2010). The biochemical action of NO_2 includes disruption of some enzyme systems, such as lactic dehydrogenase (Barnes, 1991). Nitrogen dioxide probably acts as an oxidizing agent similar to, though weaker than, ozone. Included is the formation of free radicals, particularly the hydroxyl radical HO. Like ozone, it is likely that NO_2 causes lipid peroxidation. This is a process in which the C=C double bonds in unsaturated lipids are attacked by free radicals and undergo chain reactions in the presence of O_2, resulting in their oxidative destruction (Manahan, 2003). (Bonini *et al*. 2006) reported that there is little negative effect as a result of exposure to NO_2 in normal studied subjects. However, asthmatics have been shown to

experience significant increases in cold air hyperventilation with short-term NO_2 exposures of 0.5 mg/L; however, NO_2 levels in urban environments are usually below 0.15 mg/L (Carlisle and Sharp, 2001) which is very low compared to the NO_2 concentration in excess of 1.0 mg/L that required to bring changes in pulmonary function in healthy adults (Klaunig, 2004; Barnes, 1991; WHO, 2006). For example, significant increases in airway resistance have been reported on exposure to 5.0 mg/L NO_2 (Barnes, 1991; WHO, 2006). Other studies on pulmonary effect of NO_2 showed that inhalation of 0.18 or 0.30 mg/L NO_2 for 30 min including 16 min of heavy exercise does not adversely affect the pulmonary function (Kim *et al*., 1991), and no significant pulmonary function change in both healthy and asthmatic adolescent subjects exposed to 0.12 or 0.18 mg/L NO_2 for 30 min at rest followed by 10 min of moderate exercise (Koenig *et al*., 1991). Numerous studies on people with asthma, chronic obstructive pulmonary disease (COPD) or chronic bronchitis have shown that exposure to low levels of nitrogen dioxide can cause small decrements in forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV_1) or increases in airway resistance. Generally, the lowest level of NO_2 exposure reported to show a direct effect on pulmonary function in asthmatics, was 0.3 mg/L for two and half hours exposure (Graham, 2001; WHO, 2006).

Ozone

Ozone (O_3), a secondary air pollutant, is produced from the photochemical reaction of nitrogen oxides (NOx) and volatile organic compounds (VOCs) under sunlight.(Akimoto *et al*., 2006; Manahan, 2003; Hadgson, 2010; Singh, 2013) and the influx from the stratosphere (Akimoto *et al*., 2006). Emission of NOx and VOCs are increasing dramatically as the world experiences rapid industrialization (Akimoto, 2003). O_3 is one of the pollutants of concern because it is associated with extensive health effects, most notably with the respiratory system, and it can affect both forests and agricultural crops (Sillman, 2003). Offcourse, distinguishing "good" (stratospheric) and "bad" (tropospheric) O_3 is highly essential. Tropospheric O_3 occurs from 0 to 10 mile above the earth's surface, and is harmful. but stratospheric O_3, located about 30 mile above the earth's surface, is responsible for filtering out incoming UV radiation and thus is beneficial (Manahan, 2003; Sillman, 2003). In this review, tropospheric O_3, its formation occurs through the following sequence of reactions (Akimoto *et al*., 2006; Manahan, 2003; Sillman, 2003; Hadgson, 2010), is considered. The sequence is almost always initiated by the reaction of various VOC or CO with the OH radical [$eqn.1$ and $eqn.2$].

$$V\square\square\square_1 + \square H + [\square_2] \longrightarrow R\square_2 + \square\square_2\square \ldots (eq\square\square.1)$$

$$C\square + \square H + [\square_2] \longrightarrow H\square_2 + C\square_2 \ldots\ldots\ldots (eq\square\square.2)$$

This is followed by the conversion of NO to NO_2 (through reaction with HO_2 or RO_2 radicals), which also regenerates OH [$\square\square\square\square\square\square\square.3$ and $eqn.4$].

$$R\square_2 + \square\square + [\square_2] \longrightarrow V\square\square\square_2 + H\square_2 + \square\square_2 .. e\square\square\square.3$$

$H\square_2 + \square\square \longrightarrow \square\square\square \bullet + \square\square_2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots$
$e\square\square\square\square. 4$

NO_2 is photolyzed to generate atomic oxygen, which combines with O_2 to create O_3 **[***eqn.* 5 and *eqn.* 6**]**

$\square\square_2 + hv \longrightarrow \square\square + \square \ldots\ldots\ldots\ldots\ldots\ldots eq\square\square.$ 5

$\square + \square_2 + \square \longrightarrow \square_3 + \square \ldots\ldots\ldots\ldots\ldots\ldots eq\square\square. 6$

Here, $\square\square\square\square\square\square_1$, $\square\square\square\square\square\square_2$ are primary and secondary volatile organic compounds, respectively

$R\square_2$, Represents alkyl or any organic chain attached to $\square_2$

The primary toxicological concern with O_3 involves the lungs as its exposure increases the activity of free-radical-scavenging enzymes in the lung (Akimoto *et al*., 2006), indicative of ozone's ability to generate the reactive oxidant species responsible for oxidative stress. Like nitrogen dioxide and ionizing radiation, O_3 in the body produces free radicals that can be involved in destructive oxidation processes, such as lipid peroxidation (Manahan, 2003; Singh, 2013). Exposure to ozone can cause chromosomal damage also appears to have adverse immunological effects (Manahan, 2003; WHO, 2006). Radical-scavenging compounds, antioxidants, and compounds containing sulfhydryl groups can protect organisms from the effects of ozone (Manahan, 2003; Akimoto *et al*., 2006).

Exposure to elevated ozone concentrations has been reported to give rise to symptoms that include cough, chest pain, difficulty in breathing, headache, eye irritation and a decrease in forced expiratory volume in one second, and all of these effects are likely to impact upon performance

(Carlisle and Sharp, 2001; Florida-James *et al.*,
2004;;
Bennett,
2007).

These responses are exacerbated during exercise because of the following reasons: one is the increment of the absolute amount of O_3 to be inhaled, second, the rise in the uniformity of ventilation throughout all lung tissue, and the third one is "nasal scrubbing" (i.e., absorbing gases during quiet breathing through the nose) is compromised (Hazucha, 1996; Kargarfard *et al*.,
2009). Athletes, for example, are vulnerable to the effects of inhaled O_3 because of their exercise patterns (Helenius, 2000). Both expired volume and Volume of O_2 are both dramatically increased with the onset of physical activity, whether it is heavy, short term or less intense and prolonged warm up, training, and competition (Kargarfard *et al*., 2009). The respiratory discomfort associated with O_3 exposure may cause decreased maximal work performance (Carlisle and Sharp, 2001).

Quantitatively, it is reported that a concentration of 0.1 mg/L causes decrements in lung function at an exercise intensity equating to a minute ventilation of 70 L/min (Florida-James *et al.*, 2004). Different study results cited in OEHHA (1999) reported that impairment of lung function and subsequent impairment of exercise performance were measured in exercising adult athletes (age 19-30) exposed to 0.2 mg/L ozone for 1 hour. A decrement in post-exercise forced expiratory volume in 1 second (FEV_1) of 21.6% was observed; a 5.6% decrease in FEV_1 was observed in athletes following a 1-hour exposure

to 0.12 mg/L ozone with exercise. Significant reductions in peak minute ventilation, oxygen uptake, and tidal volume were observed in athletes exposed to 0.2 mg/L ozone, but not in those exposed to 0.12 mg/L, and athletes exercising in elevated ozone, exhibited reduced endurance and lung function (Kargarfard *et al*., 2009). For asthmatics exposed to 0.08 mg/L and higher of ozone, the forced expiratory volume (FEV) is reduced during physical exercise (Akimoto *et al*., 2006). In a similar study, 3% decrease was observed in FEV_1 in male children (age 8-11) following a 2.5 hour exposure to 0.12 mg/L O_3 with intermittent exercise (OEHHA, 1999). No significant increase in cough was noted as a result of O_3 exposure. A study cited in OEHHA (1999) reported that significant O_3 associated decrements in forced vital capacity (FVC), FEV_1, peak expiratory flow rate (PEFR), forced expiratory flow (FEF)25-75, and the ratio of FEV_1/FVC in healthy adults following outdoor exercise in ambient ozone concentrations of 0.021 - 0.124 mg/L for an average of 29 minutes.

Photochemical Smog

Photochemical smog is a reddish brown haze that is often seen in many urban areas. It is created by sunlight-promoted reactions in the lower atmosphere that has devastating effect on the environment (Manahan, 2003). Once O_3 and NO_2 together with volatile organic compounds (VOCs) are in the troposphere they combined with hydrocarbons to form an other secondary pollutant Peroxyacetyl nitrate (PAN), the oxygen and Nitrogen containing compound found in the troposphere (Manahan, 2003; Illerup, 2008). VOCs consist of a group of more than 100 chemicals formed during incomplete combustion of fuel and other organic substances, many of which are carcinogenic (Sharman, 2004; Carlisle and Sharp, 2001).

The typical smog episode occurs in hot, sunny weather under low humidity conditions with the characteristic symptoms of brown haze in the atmosphere that causes reduced visibility, eye irritation, and respiratory distress on human. Prolonged effects on laboratory mice exposed to community photochemical smog levels (0.14 mg/L average of the daily "total oxidant" maxima) over a 16 month period showed an increase in lung tumor development (Luis, 1967). In general, the effect of photochemical smog is the synergistic effect of O_3, NO_2, VOCs and PAN, mostly O_3 as it constitutes about the 90 % of the smog (Illerup, 2008).

Global Warming

The release of Greenhouse gases, those that absorb heat radiates from Earth's surface and release some of it back towards the Earth, increasing the surface temperature. These gases benefit humans by maintaining a stable, moderate temperature. A substantial increase in greenhouse gases could harm human life. These gases are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), ozone (O_3) hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) (Harrison, 1999; Manahan, 2003). A report by the

Intergovernmental Panel on Climate Change (IPCC) shows that global emissions of greenhouse gases have risen to unprecedented levels despite a growing number of policies to reduce climate change (IPCC, 2014). These policies are majorly focused on the reduction, sequestration and storage of carbon dioxide (CO_2) as far as the global warming and climate change issues are considered (Vercruyssen, 2007).

Global warming creates hot weather which can be the cause of heat stress on three aspects of sports participation; comfort, performance, and health/safety. When exercising, the human body can reach temperatures of 41˚C (from normal body temperature of 37˚C), and it may be difficult for the body to cool itself down in a hot, humid environment. Typical signs of heat stress include: nausea, cramps, clammy skin, dizziness and confusion (Gassewitz and Radomski, 2008). The body temperature may be cooled by radiation (transfer by electromagnetic waves), convection (wind or air movement), conduction (by contact) or evaporation (by sweating). The most common method of cooling when the surrounding temperature is hot is through sweating. One litter sweat evaporation results in 600 kcal heat loss (Gassewitz and Radomski, 2008). During exercise, sweat can be produced at a rate of over two liters per hour, and sweat losses of over 6 liters per hour have been recorded in marathon runners (Gassewitz and Radomski, 2008)

When temperature increased above an optimum, performance decreased and the more the temperature increases, the larger the decreases in running speeds. For example the optimal temperature at which women's maximal running speed attained was 9.9 °C, and an increase of 1°C from this optimal temperature will result in a speed loss of 0.03% (Helou *et al*., 2012). Hot weather and its first measurable impact is the reduction of physical performance (Kenefick, 2007; Maughan *et al*.,2007; Hargreaves, 2008) as it is detrimental for the cardiovascular, muscular and central nervous systems (Helou *et al*., 2012). Moreover; warm weather enhances the risk of exercise induced hyperthermia like heat cramp, heat exhaustion and heat stroke. During exercise some of the energy is transformed to external work, but the efficiency of this energy is usually less than 20-25%. Therefore, 75-100% of the liberated energy appears as heat in the active muscle tissue. The amount of heat generated in the body must be dissipated to the environment, or else the heat content and the temperature of the body will increase and endanger the homeostatic setting of the body (Michael *et al*., 2003). This situation will exacerbate when exercising in hot weather and exposes to heat related illness. Heat related illnesses represent a spectrum of disease ranging from heat cramps, exhaustion and edema all leads to heat stroke and death; Heat stroke is typically presents in warm, humid conditions with elements of overexertion and dehydration on the part of the athlete with high mortality rates if unrecognized and emergency actions have not been taken (Francis *et al*., 2005).

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Part Two
Ethiopian Journal of Sport Science Reviewers and Authors Guidelines

2. Introduction

Ethiopian Sport Academy is a center of excellence in sports established by Proclamation No. 1263/14 The Academy constitutes two training campuses. The main campus, which constitutes a total of 24.4 hectares of land, is situated in Addis Ababa, Bole Sub City, Woreda

03. Athlete Tirunesh Dibaba Sports Training Centre is the second training campus located in Assela town, 170 kms East of Addis Ababa. The Assela campus is founded in 2009 and is currently offering training to youth in Football and Athletics. The main campus, which was founded in 2013 is currently offering training in nine sports such as Football, Basketball, Volleyball, Athletics, Table Tennis, Swimming, World Taekwondo, Box and Cycling. The Academy has plans to include other sports events in its curricula. Therefore, the academy has more than **45** coaches of different discipline and **450** supportive staffs.

These days, in different part of the world, senior coaches of different sport discipline conducting research and published their findings to the entire world to be used by other junior or beginner coaches while coaching their young athletes for the betterment of their sport training. In connection with this, our coaches of different sport, should also conduct research and disseminate their out puts to the rest of the country as well as sport professional to implement or use the current research findings for their sport training. To use the current research out puts, it needs different dissemination strategy. One of these dissemination strategies is journal.

In Ethiopia, for the last several years, our sport professionals, coaches and University lecturers, were suffering to publish their research findings in different journals of the country because of the relevancy of the sport profession with their journals which have been published by different universities of our country. Therefore, it is mandatory and very urgent to launch new specific journal in the field of sport profession to create a wonderful platform for sport professionals in general and young researchers in the academy in particular to publish their research findings.

2.2 Name of the journal

The Ethiopian youth and sport academy launched a scientific journal with the following name and abbreviation:

"Ethiopian Journal of Sport Science" or EJSS.

2.3. Scope of the journal

The Ethiopian Journal of Sport Sciences is a peer reviewed open access, inter and multidisciplinary journal published by Ethiopian youth and sport academy. The journal dedicated to expanding access to Ethiopian sport research, increasing intra-Academies or Universities scientific collaboration, and building academic research capacity in Ethiopia. The journal aims to provide a modern, highly-visible platform for publishing Ethiopian sport research and welcomes submissions from different scientific disciplines and publishes original research papers, systematic and scholarly review articles, and critical papers which will stimulate debate on research, policy, theory or philosophy of **sport** as related to **training** and **development** in **Ethiopia**, technical reports, and short communications, and which will meet the journal's high academic and ethical standards. Manuscripts of **sport training**, education, management, and research are encouraged. This journal will have five main sections. These are: **Technical report**, **Reviews and Analysis**, **Technical Notes and preliminary communications**, **Sport Sciences Issues**, and **Dataset Papers**. Moreover, the journal values critical scholarly debate on issues that have strategic significance for coaches, trainees,

educators, practitioners, leaders and policy-makers of **sport profession in Ethiopia.**

The following are broad categories

: Sport youth training
: Sport Biomechanics
: Sport psychology
: Sport physiology
: Sport management
: Sport sociology
: Sport medicine
: Sport rehabilitation
: Sport for Development
: Sport Pedagogy

The study should define principles of broad applicability, be related to problems over a sizable geographic area, or be of potential interest to a representative number of scientists.

2.3.1. Characteristics of a Strong Manuscript

Before describing the characteristics of a good manuscript, we turn briefly to problems associated with a poor one. Bartol (cited in Eichorn & VandenBos, 1985) identified the following main problems:

inadequate review of the literature,
inappropriate citations,
unclear introduction,
ambiguous research questions,
inadequately described sample,
insufficient methodology,
incompletely described measures,
unclear statistical analysis
inappropriate statistical techniques,
poor conceptualization of discussion,
discussion that goes beyond the data,
poor writing style, and
excessive length

2.4. Organizational structure of the journal

The Ethiopian Journal of Sport Sciences (EJSS) comprise of Editor-in-chief, Editorial Board members, and Advisory Board members.

2.4.1. Journal Advisory Board

The journal Advisory Board is consists of a group of prominent and well respected individuals in the journal's field and working in different part of the world in scientific activities like research. They act as ambassadors for journals and will provide advice on key policy issues and strategic direction of the journal. The size of Advisory boards varies across disciplines but, the journal will have up to 10 Advisory Board from different discipline and different part of the world in the field of sport sciences.

2.4.1.1. Qualification and experience of Advisory Board

The formation of the Editorial Board is done through incorporating global experts with excellent academic track record and expertise in the respective journal subject. There is no restriction in the number of the Editorial Board members. Advisory board members should have a Ph.D degree in the relevant subject and must have good publication record and adequate exposure to scientific journal writing, editing, or managing.

2.4.1.2. Terms of service

The terms of service for the appointed Advisory will be a minimum of three years and a maximum of five years. May appoint Editorial Board for a prescribed duration and add or revise constitution of the Board if required.

2.4.1.3. Duties and responsibilities of Advisory Board

The following duties and responsibilities of the Advisory Board of the journal will be actively involved to achieve the Journal objectives. Therefore, they will have the following duties and responsibilities. These are:

Reviewing Editorial policies and guidelines periodically.
Advise on journal policy and scope.
Reviewing draft documents of manuals and instructions, drafted by Editorial Board, related to publication processes.
Consulting the Ethiopian youth and sport Academy research Directorate director and the chief journal editor related to journal office administration and publication process.

Holding periodic meetings for enhancement of office administration, journal sustainability, and quality issues.

Assist the editor(s) in decision making over issues such as plagiarism claims and submissions where reviewers can't agree on a decision.

3.4.1.4. Advisory Board members

Tefera Tadesse Jimma (Ph.D)

Associate Professor of Curriculum and Instruction, IER, AAU,
Humboldt Senior Research Fellow
Institute of Medical Education, University Hospital, LMU Munich, Germany

Professor. Wolfgang Immanuel Schöllhorn,

Professor Movement and Training Science
Director of Sport Institute at University of Mainz ,Germany

Prof. Dr.Victor Babu Koppula

Professor, Department of Philosophy, Andhra University, India and
Editor-in-Chief of:-
IJMER (International Journal of Multi-Disciplinary Educational Research) and
Sucharitha : A Journal of Philosophy and Religion

Associate Professor Feked Tuli

Associate Professor in Educational Research at Kotobe Education University
Vice President of Kotobe Education University

2.5. Journal Editorial Board

Editorial Board members and Editors are often a good bet for identifying topics that are of importance to the community which our journal serves. Scientific journals will require all members of the journal, specifically, Editors and Editorial Board members to obey by COPE of Conduct and best practice Guidelines for Journal Editors.

The composition of editorial Board members should be from all discipline based on the scope of the journal. The journal Editors and Editorial Board members will have the following structure and number. These are listed as follow;

Editor-in-Chief (1)
Editor Manager(1)
Associate Editors(7)
Journal Secretary(1)
Technical Editors(1)
Language Editors(1)
Copy Typist(1)

Therefore, the editorial Board of the journal will have five members chosen for their expertise based on the scope of the journal and one copy typist.

2.5.1. Qualification and Experience of Editorial Board members

The Journal Editorial Board basically consists of a group of prominent people in the Journal's sub-disciplinary field of study. All Editorial Board members should be appropriate and in line with the aims and scope of the Journal and represent each discipline of the Journal. Concerning to experiences of the editorial Board members, they should have many years of experience in research and also should have publications in his/her area of expertise and be committed to participating in the process of providing timely, high-quality reviews for the Journal. In general, the Editorial Board will be reviewed and evaluated occasionally by the Academy research Directorate. Editorial Board members may be asked to submit an updated version of their profile/resume.

2.5.2. Appointment and terms of Service of each Editorial Board member

The **Editor –in-Chief** will be selected and assigned by the Academy research Directorate of Ethiopian Youth and Sport Academy. The **Associate Editors** will be identified potential candidates from different discipline, based on the scope of the journal, and assigned by the Academy research Directorate. Then, the

assigned Editorial members will be notified with an official letter signed by the Academy Research Directorate Director.

2.5.3. General duties and responsibilities of the Editorial Board

Editors are responsible for all the contents published in their journals, which means that they should strive to meet the needs of readers and authors, seek to constantly improve their journal, have well-defined editorial processes that ensure the quality of published material and promote freedom of expression.

The editor should refrain from considering manuscripts when there is a conflict of interest because of competition, cooperation and other relationships or connections with any of the authors, companies or institutions associated with the manuscript.

Editors should ensure the integrity of academic records and publish corrections, clarifications, retractions or apologies whenever needed.

Providing integrity and credibility of the research contributions,

The editor should actively seek the opinions of authors, readers, reviewers and members of the editorial board of the possible ways of improving the journal.

Establishing and maintaining quality of the journal by publishing quality papers in his/her journal

Promotion of freedom of expression within the cultural, constitutional/legal framework,

Providing corrigendum for any correction, clarification and apologies where required

The editor's duty is to support initiatives that will reduce publication and academic misconduct and to introduce and educate researchers about the provisions of publication ethics. The policy of the journal, if necessary, should be modified taking into account new technical and scientific knowledge about peer review, journal editing and publishing, and the effects of policy on the behavior of the journal authors and reviewers.

Meeting the needs of authors and readers,

The editor needs to convince the owners and/or publishers of the journal of the need to ensure the necessary resources, including the occasional involvement of other professionals (e.g. designers, lawyers, etc.).

Maintaining ethical standards of their journal,

Editors should systematically assess the impact of their guidelines on authors and reviewers, and revise them if necessary, encouraging responsible behavior and discouraging misconduct.

The Editor should:

promptly respond to the author (s) of the papers submitted for publication, and

Assign a specific number to an article submitted for processing; and pay impartial consideration to all research papers submitted for publication.

To ensure evaluation of the content of research papers impartially,

Disregard the discriminating factors, e.g. gender, race, ethnicity, religious belief, cultural sentiments, political affiliation, seniority and/or institutional association of the author(s) while selecting articles for publication,

To ensure impartiality of the review process by informing the reviewer (s) that s/he needs to disclose any conflicts of interest regarding the submitted research paper.

Good practices for their job would include to:

Encourage new ideas and suggestions of authors, peer reviewers, members of editorial board and readers for improving quality of his/her journal,

Apply the process of blind peer review in true letter and spirit,

Promote innovative findings in respective field and publishing them on priority,

Promote anti-plagiarism policy,

Educate contributors (authors) about ethical practices in research, and

Implement the journal's policy without institutional pressure and revise the policy from time to time.

2.5.4. Detailed duties and responsibilities of each Editorial Board member

The Editorial Board member duties and responsibilities are very important to make the journal better and to achieve its objective. Therefore, each Editorial Board members of the Journal duties and responsibilities are described in detail below.

2.5.4.1. Editor-in-Chief

Editor-in-chief is the most senior editor who has overall responsibility for the journal and served as the chair of the Editorial Board. He/she has also a responsible for managing the production of all content for the publication.

The Editor-in-Chief shall develop procedures for manuscript submission, review and reviewer criteria, acceptance, managing day-to-day operations, and publication of the Journal. The editor-in-Chief shall have the following important skills:

Proofreading skills involve the ability to identify errors in spelling, grammar, syntax, style and tone while reading written text.

Copyediting skills involve revising written text to improve readability while also ensuring the information is accurate, consistent and free of omissions or repetitiveness.

Editors-in-chief need strong communication skills to provide feedback to copywriters, journalists and editors in a positive manner that encourages growth and change when necessary.

An editor-in-chief needs to have strong attention to detail to ensure consistency in the style and tone of their publications.

As the highest-ranking position on the editorial staff, the editor-in-chief must motivate, encourage and provide instruction to the other members of the editorial members to lead the publication to success.

An editor-in-chief has supervisory authority over their team and represents their team at social events and gatherings, so they need to have strong listening skills, empathy and the ability to build positive professional relationships.

An editor-in-chief needs excellent organization and time-management skills to ensure they can prioritize tasks, plan and complete projects by their deadlines, remember important details and maximize their efficiency and productivity.

The Editor- in-Chief may have the following additional duties and responsibilities:

Approve the publication's layout, design, and styles.

Acting as a representative for the publication at events.

Delegate Editorial roles to other members of the Editorial Board.

Develops, in consultation with other Board members and the Advisory Board of EJSS, systems to enhance the advancement of the Journal.

Handles, by presenting the matter to the Board through the Associate Editor and Editor Manager, the appeal procedure for manuscripts that are rejected.

Making final decisions about which stories, articles and photographs to publish.

Assigns an appropriate Associate Editor for specific papers and also notifies the author when a manuscript is accepted or not for publication.

Developing and managing budgets for the editorial team.

2.5.4.2. Editorial Manager

The Editorial manager, in collaboration with the Editor-in-Chief, is generally responsible for supervising and allocating the work to editors, reviewers, authors, and reporters. He/she develop, manage, and execute the editorial strategies within all editorial content to increase readership and generate leads. The Editorial manager also ensures that the entire editorial process is competed perfectly within the allocated time as per the standards and guidelines. The Editorial Manager is the primary copy editor for

the journal and generally oversees the overall production process from edited manuscript through printed pages.

As a manager, the editorial manager is also responsible of recruiting/hiring and supervising all employees of the journal and also works as a public relation agent (to manage the flow of information between an organization and its public). The Editorial manager will consult with the Editor-in-Chief and the Director of Ethiopian Youth and Sport Academy Research Directorate on various improvement options for the Journal. Moreover, the manager will write articles, letters, blogs, newsletters, and media posts in conjunction with the other Board members.

2.5.4.3. Associate Editors

The Associate Editors are responsible for the scientific and intellectual content of the Journal in their fields. They are responsible for obtaining reviewers for manuscripts assigned to them and also they should have at least 50% representation of scholars from outside of the Academy. The Associate Editors review and evaluate the technical content of the manuscript and its suitability for publication in the Journal and recommend to the Editor-in-Chief the course of action that should be taken regarding a manuscript submitted to the Journal. The Associate Editor is also responsible for receiving manuscripts, replying to authors on the status of the manuscripts, following up on review and publication processes, following up publication production process, promoting and marketing the Journal. He/ she also prepares budget and submits it to the Editorial Board for approval. Associate Editors will be responsible for reviewing the submitted research articles;

2.5.4.4. Journal Secretary

The Journal Secretary, in close collaboration with the Editorial Manager, is responsible for providing efficient and responsive secretarial and administrative support to the Editorial Board. In general, the duties include effective handling of information using tact and discretion; managing files (document paper and electronic information); ensuring correspondence and calls on behalf of the Editorial Board members; preparing correspondence on his behalf, including drafting general replies and processing expenses claims. Moreover, the Journal Secretary will be responsible for prioritizing and responding to inquiries by letter, telephone and email, directing them as appropriate; coordinate and manage meetings and conference calls, take minutes and ensuring arrangements are effectively managed; prepare summary information and annual reports; liaise between Human Resources in organizing the recruitment of new staff; establish efficient office systems including filing, handling and disposing of confidential information and ensure that the group web-pages and intranet site is up to date.

2.5.4.5. Language Editor

The Language Editor ensures that the document is structurally correct (spelling, punctuation, and grammar) and stylistically consistent. If there are language issues with the article the Technical or Associate Editor may recommend the Language Editing Service. Then, the language editor will take necessary action for the betterment of the journal.

2.5.4.6. Technical Editor

The Technical Editor compares the final version of the document with the marked-up version to make sure that all corrections have been made. He/she also reviews both content (for completeness, accuracy, and appropriate language) and form (for the organization, visual design, and usability) of the article.

2.5.4.7. Proposed list of Editorial Board members

Dr. Aemero Asmamaw
Dr.Zelalem Melkamu
Dr. Abera Desalegn
Dr. Atakelit Hailu
Dr. Telahun Bereded
Ass. Prof. Besher Edo

2.5.5. Reporting mechanism of the editorial Board to the Academy

As stated above, the Editorial Board of the Journal are a group of individuals working as a team with the Editor-in-Chief with the ultimate objective of developing an outstanding journal and promoting new initiatives for improvement. The Editorial Board of the Journal, chaired by Editor-in-Chief, will be accountable to the Director of Ethiopian Youth and Sport Academy research Directorate. The Editor-in-Chief of the Journal will directly report to the Editorial Board. The Editorial Board of the Journal is expected to have a regular communication forum among members via teleconference and Skype. Depending on the availability of funding, the Editorial Board of the Journal shall make face to face meetings to discuss issues including: advice on journal policy and scope; to work with the Editor-in-Chief's about the on-going development of the Journal; to identify topics for special issue; to recommend a conference which would promote the Journal

2.5.6. Editorial Board meetings

Editorial Board meetings are useful opportunities to meet with the quorum or all of the Editorial Board members to brief them on issues, take questions and also gain ideas for policies and upcoming journal editions. The meetings can be done face to face, or via telephone or video conferencing. To ensure smooth functioning of the journal, the Editors are responsible for conducting the Editorial Board meetings on regular basis (at least twice a year). When Board meetings are not possible, the meeting can be arranged on an individual basis at conferences or other events. Board members' meeting is a key way of networking and building and strengthening the relationship with the Editorial Board members.

2.5.7. Editorial Policy and Working principles

The Editorial policy deals with the work ethics and principles of the Editorial Board that govern the work relationships between members of the Editorial Board, editors, and the author(s).

Confidentiality

The Editor must ensure confidentiality of the author(s) and reviewers during the process of double-blind peer review.

Information pertaining to an article and all communications with referees and corresponding authors as confidential and should not be disclosed by the Editor to anyone except the author(s), reviewer(s), and editorial board members,

Upon reaching a decision about a research paper, only the Editor may disclose or announce title of the study and name of the author(s) that has been accepted for publication. Any other information may only be disclosed with the prior approval of the author(s), and

Confidentiality of the participants of the research should also be ensured by protecting personal information (e.g. identifiable personal details, images, and/or individual results). Editor should declare clear guidelines to the contributors (authors) regarding confidentiality of the individual participant.

Prior to publication, the content of the manuscript should be kept confidential, both the Editor and reviewer(s) will not share or use any part of the work.

2.5.8. Code of Conduct for Journal Editors

Editors mainly work with the Journal Editor-in-Chief. The Editor-in-Chief can include any Editorial Board member and delegates Activities for the Editorial Board. Code of conduct for journal editors is designed to provide a set of minimum standards which should be followed by the editors of scientific publications and journals.

Editors, Associate Editors, and Journal Staff

Editorial staff must not use information gained through working with manuscripts for private gain. Editors should publish regular disclosure statements about potential conflicts of interest related to the commitments of journal staff. Guest editors should follow these same procedures.

2.5.8.1. Ethical Guidelines to Editors of the Journal

1. An editor should give unbiased consideration to all manuscripts offered for publication, judging each on its merits without regard to race, religion, nationality, sex, seniority, or institutional affiliation of the author(s). An editor may, however, take into account relationships of a manuscript immediately under consideration to others previously or concurrently offered by the same author(s).
2. An editor should consider manuscripts submitted for publication with all reasonable speed and attention.
3. The sole responsibility for acceptance or rejection of a manuscript rests with the editor. Responsible and prudent exercise of this duty usually requires that the editor seek advice from two or more reviewers, chosen for their expertise and good judgment, as to the quality and reliability of manuscripts submitted for publication. However, manuscripts may be rejected without review if considered inappropriate for the journal.
4. The editor and members of the editorial team should not disclose any information about a manuscript under consideration to anyone other than those from whom professional advice is sought. (However, an editor who solicits, or otherwise arranges beforehand, the submission of manuscripts may need to disclose to a prospective author the fact that a relevant manuscript by another author has been received or is in preparation.) After a decision has been made about a manuscript, the editor and members of the editorial team may disclose or publish manuscript titles and authors' names of papers that have been accepted for publication, but no more than that unless the author's permission has been obtained.
5. An editor should respect the intellectual independence of authors.
6. Editorial responsibility and authority for any manuscript authored by an editor and submitted to the editor's journal should be delegated to some other qualified person, such as another editor of that journal or a member of its Editorial Advisory Board. Editorial consideration of the manuscript in any way or form by the author-editor would constitute a conflict of interest and is therefore improper.
7. Unpublished information, arguments, or interpretations disclosed in a submitted manuscript should not be used in an editor's own research except with the consent of the author. However, if such information indicates that some of the editor's own research is unlikely to be profitable, the editor could ethically discontinue the work. When a manuscript is so closely related to the current or past research of an editor as to create a conflict of interest, the editor should arrange for some other qualified person to take editorial responsibility for that manuscript. In some cases, it may be appropriate to tell an author about the editor's research and plans in that area.
8. If an editor is presented with convincing evidence that the main substance or conclusions of a report published in an editor's journal are erroneous, the editor should facilitate publication of an appropriate report or note pointing out the error and, if possible, correcting it. The report may be written by the person who discovered the error or by an original author of the research.
9. An author may request that the editor not use certain reviewers in consideration of a manuscript. However, the editor may decide to use one or more of these reviewers, if the editor feels their opinions are important in the fair consideration of a manuscript. This might be the case, for example, when a manuscript seriously disagrees with the previous work of a potential reviewer.
10. An Editor should ideally send a PDF rather than Microsoft Word or other electronic file to

reviewers and request that amendments, alterations or comments not be made to the electronic copy of the manuscript. It is important that all anonymous comments appear as such and with programs such as Word the computer and user is often shown in tagging comments or amendments.

2.5.8.2. Editor's Relations with Readers

Readers should be informed about who has funded research or other scientific engagement and whether funders had any role in the research and publication, and if so, what kind. In this sense, the editors should ensure that all published research papers are reviewed by qualified reviewers (including statistical reviews if necessary) and that non-reviewed parts of the journal are clearly marked. Editors should systematically adopt processes that promote accuracy, completeness and clarity of research reporting, including technical editing and the use of appropriate guidelines and regulations, especially when it comes to research in Sport medicine and related areas. Editorial boards should inform the readers about authorship and contributor ship, transparently listing contributions and discouraging misconduct, such as the appearance of authors who have significantly contributed to the work but are not listed as authors (ghost authors) or the authors who listed, but did not contribute to the work to an extent sufficient for authorship (guest authors). Editorial boards should also inform readers about the steps that have been taken so that the published works of people related to the journal issuance or of the members of the editorial board were objectively and impartially assessed.

2.5.8.3. Editorial Members Relations with Authors

Editor's decisions on acceptance or rejection of an article should be based on the importance of the article, originality and clarity, validity and relevance of the research for the area which the journal covers, regardless of race, gender, sexual orientation, religious beliefs, ethnicity, nationality or political beliefs of the author. Editors under the research standing committee must ensure or propose appropriate reviewers of submitted papers, i.e., individuals who are able to assess the article and are not in conflict of interest. In doing so, the editors should take into account the author's request for exemption of certain persons, if it is clearly explained and applicable. A detailed description of the review process should be available to authors, and editors should be prepared to justify any deviation from it. Editors may not change decisions made on acceptance or rejection of articles, except in the case of serious problems associated with the submitted article. The journal should establish mechanisms for authors to complain on the decision of the editor.

The instructions for authors should contain clear information on what is expected from them by editors. These instructions should be updated regularly.

Editors should provide guidance on the criteria of authorship, as well as on the criteria for collaborators, following the standards to be applied within the scientific field (e.g. responsible research publication: international standards for authors, etc.). In addition to the authors or collaborators, the information about the potential conflict of interest should be clearly stated.

2.5.8.4. Editorial Board members Relations with Reviewers

Editors through the research committee's secretary should provide clear guidelines for reviewers, stating all that is expected from reviewers, including confidential material submitted for review. Before their consent, reviewers should declare their potential conflicts of interest. Privileged information or ideas obtained during the review process shall be kept confidential and should not be used for personal gain.

Editors should ensure the protection of the identity of the reviewer, except in the case of open

review, during which the reviewer selects whether his /her identity will be disclosed or not.

Editors Chief usually the research committee's chairperson selects two or more persons who have appropriate professional competence for evaluating manuscripts, gives these clear guidelines for the implementation of the review process and is responsible for its objectivity and timeliness.

Reviewers are encouraged to comment on various ethical issues related to the possibility of research misconduct raised by submissions (e.g. unethical research design, lack of patient consent to be research subjects, protection of research subjects, for example, Athletes, improper handling and presentation of research data, etc.).

Reviewers are encouraged to comment on the originality of submissions and the caution related to redundant publication or plagiarism. Editorial reviewers can provide the tools for the detection of related publications (e.g. links to cited literature and results of bibliographic search).

Reviewer comments are sent to the authors in its entirety, unless they contain derogatory or offensive remarks.

Editors in different ways acknowledge and reveal the contribution of reviewers and encourage academic and scientific institutions to respect of the activities of reviewers and to recognize reviews as an important part of academic achievement.

Editors Chief or Secretary (usually the research Directorate or Expert in the academy) develops and maintains a database of reviewers that is regularly updated, adding new reviewers and removing those who systematically produce poor quality or late reviews. In this way, editors Chief monitor the work of reviewers and quality of review and take all steps to ensure high quality of the review process. Editors use different methods to identify new reviewers, for example, suggestions of authors or by searching bibliographic databases, with the aim that the reviewer corpus represents the community of the scientific field and journal well.

Editors' council should take reasonable measures in the event of ethical complaints submitted in relation to the manuscript or article. These measures refer to contacting the author of the manuscript or article and stating complaints or claims with due diligence, and if there is no response to the complaint, they may include further recourse to competent institutions and academia, as well as publication of a correction, recall, expressing concern or other appropriate response. Every reported case of unethical behavior must be investigated, even if detected several years after the publication.

2.5.8.5. Relations of editor with Editorial board members

Editors should ensure that new members of the editorial board receive instructions about their expected work and report regularly new policies and changes to the existing members. The journal should have a policy of handling the work of editors to ensure impartial peer-review.

At least once a year, members of the editorial board will be invited to the assessment of journal management, submission of comments and suggestions to improve the journal or the work of the editorial board and inform them of any changes in the journal policy as well as future challenges.

2.6. Quality assurance

Editors must take all reasonable steps to ensure the quality of published material, considering the fact that the journal and its parts have different goals and standards. Editors should have systems for the detection of false data (e.g. manipulated photographs or plagiarized text) at their disposal, which can be used regularly or in case of doubt. Journal style should be based on factors that improve quality reporting (e.g. adoption of structured abstracts, standard style of referencing-established in the international scientific community, the use of guidelines such as CONSORT, etc.), rather than on aesthetic or personal preferences.

2.8. Protection of individual data

Editors are required to comply with the Act on Personal Data Protection in force Law. The confidentiality of information obtained during the research or professional interactions (e.g. between doctors and patients, researchers and respondents in the survey, etc.) always has to be protected. Therefore, it is almost always necessary to obtain a written consent for publishing by persons that could identify themselves or be identified by others (e.g. case studies or photos).

Disclosure of personal information without the express consent may be permitted only when the public interest transcends any damage, if it is impossible to get approval and, if is not likely that a reasonable individual would oppose to its publication.

The policy of publication of personal data should be publicly disclosed and clearly explained to the authors. It should be noted that consent to participate in research and undergo treatment is not the same as consent to the disclosure of personal information, photos or quotations.

2.9. Encouraging academic integrity

Editors should try to ensure that the research is conducted and published in accordance with the relevant international standards and guidelines (for example, the Declaration of Helsinki for clinical research, AERA and BERA guidelines for research in the field of education, etc.).

Editors should seek guarantees that all research was approved by the appropriate bodies (e.g. Research ethics committee), where they exist. However, editors should consider that such approval does not guarantee the ethics of research. If editors have concerns or they need additional explanations, they should ask for evidence of ethical approval for the research and ask the authors questions about the ethical aspects of the research (such as, how the Athletes in the survey were asked for the consent and how it was obtained, or what methods to reduce suffering were applied). It is necessary to ensure that the reports on clinical trials refer to compliance with the relevant international or national guidelines for the protection of research participants.

It will be designed to appoint an ethical adviser for the journal, who the editors will contact in specific cases, and who would periodically review regulations, instructions and guidelines of the journal.

2.10. Procedures in cases of scientific misconduct

In case the editors suspect scientific misconduct, or somebody has warned them about it, they have an obligation to act, regardless of the fact whether the work has been published or not. Editors cannot simply reject the manuscripts that raise concerns or doubts about the possible scientific misconduct. Ethics require the investigation of such cases, and it is recommended to follow the procedure, whenever possible and regardless of the complexity of the procedure and the effort. Editors should primarily seek answers from those whose behavior raises concerns. If they are not satisfied with the answer, they should refer the matter to the relevant employer, institution or competent body, with the aim to investigate the alleged scientific misconduct in depth.

2.11. Ensuring the protection of academic records

Erroneous, inaccurate or misleading statements must be corrected immediately, with due prominence. Editors should follow international guidelines for retraction, e.g. COPE guidelines. Editors should take steps to reduce the possibility of publishing a recurring publication and presentation of anonymous trials. It is also necessary to ensure the safe storage of published materials (e.g. storage in national and international repositories). It is very important to ensure that the articles are freely available to their authors.

2.12. Intellectual property

When it comes to issues of intellectual property editors need to be careful and cooperate with the EYSA research directorate for considering potential violations of the laws and conventions

of intellectual property. In doing so, the application of tools to detect plagiarism in received manuscripts (e.g. software that detects the texts that are similar) can be helpful, either as part of the regular editorial process or when suspicions are raised. Editors need to support the authors whose copyright has been infringed, or who were victims of plagiarism. In cooperation with the publisher editors should defend the rights of authors and prosecute offenders.

2.13. Stimulating discussion

Editors should encourage and be willing to consider persuasive criticism of an article, and the author of the criticized material should be given a chance to respond. By no means should the publication of research reporting negative results be excluded, and the research that questions the results already published research should be considered.

2.14. Complaints

Editors should immediately respond to complaints and ensure the procedure where dissatisfied applicants can forward their complaints.

2.15. Fair play and Impartiality

□ The criteria for the selection of research papers must be impartial and the Editor should select academically and scientifically sound articles,

2.15.1. Editing and Formatting Guidelines

• The Editor should prepare clear guidelines about preparing and formatting of a paper and print these guidelines in each issue of the journal,

• The guidelines should cover information related to 'content' and 'format' of a research paper,

• Preferred manual style is. APA declared as a policy decision.

2.15.2. Disclosure

• The Editor must not use any unpublished information/data from the submitted research paper without the permission of the author(s), and

• Any information received after the peer review process must be kept confidential and not used for personal gains.

2.15.3. Publication Decisions

• The Editor should only shortlist research papers which have relevance to the scope of the journal clearly stated in the Journal, using his /her judgment, but without any personal bias.

• After completion of the reviewing process, the submission of revised manuscript, and assessing the quality and validity, the Editor has a right to accept or reject a research paper.

• The Editor's decisions to accept or reject a paper for publication should be based purely on merit, academic standards and professional demands of the journal.

• The Editor must justify the reason (s) of rejecting a research paper to author(s). This may include:

■ Failure to fit in the scope of the journal (may be communicated after preliminary review)

■ Insufficient depth of content

■ Major errors related to design, analysis, write up and format

■ Any misconduct or conflicting factors (e.g. plagiarism, copyright infringement, legal issues, fake data, authorship issues)

• The Editor is required to timely communicate the editorial decision to the author(s),

• The Editors should not reverse decisions in favor or against author(s) on their own.

Publication Recommendation

To further differentiate the roles of gatekeeper and consultant (and to make the Action Editor's job easier when quite discrepant recommendations are received) we ask that you communicate your publication recommendation only on the standardized evaluation form, which is not shared with authors. **Please do not include an explicit recommendation about acceptance, revision, or rejection in your narrative evaluation that will be shared with the authors**.

In making your publication recommendation, please consider these guidelines developed by the APA Publication and EYSA Standing Committee:

To merit publication each manuscript must make an original, valid, and significant contribution to an area of sport appropriate for the journal to which it is submitted. That is:

(1) A manuscript cannot have been published, in whole or in part, in another journal or readily available work.

(2) A manuscript must be accurate, and the conclusions and generalizations must follow from the data.

(3) A manuscript must be more than free of major fault—it must be an important contribution to the literature.

(4) A manuscript must be appropriate for the journal. For a manuscript not meeting all those criteria, you will usually recommend rejection, with detailed reasons for your recommendation. (emphasis in the original)

As you consider these policies in formulating your publication recommendation to the Action Editor, it may be helpful to think in terms of the answers to three sequential questions:

2.Is the topic of the manuscript appropriate for *EJSS*?

3.If the Editor believes that a manuscript is clearly outside the scope of the journal, it is rejected without peer review. However, you may receive a manuscript to review because the Editor has some question about its appropriateness for *EYSAJ*. It is helpful for the Editor to have your opinion on this question. The standardized rating form contains an item assessing fit. You might also decide to address this question in your narrative. A statement describing the topics appropriate for publication in *EYSAJ*. is included inside the front cover of each issue.

4.Does the manuscript make a significant scientific contribution? A key determination is thus: Is the manuscript important? This is a difficult question to answer at times but perhaps these alternative versions of the importance question can help:

Does it add significantly to the literature in the field? Will it stimulate more research/theory in the area?

Will it be cited frequently?

Does it offer a new/creative approach that has the promise of serving the field well?

There are many manuscripts that represent sound work, using common methods and designs, but these alone are not appropriate criteria for acceptance.

The *manuscript should add significantly to the field*. This is not a simple decision, but this is perhaps the central issue involved in the publication recommendation. What this means is that many well-done studies may not be accepted because they do not surpass the importance criterion. Given the state of our knowledge, as that of ever increasing, this bar is ever changing. What was new and creative three years ago may now be standard. So, the key assessment is "Will the manuscript move the field forward significantly?" The *EJSS* Manuscript Evaluation Form contains items for you to rate the scientific contribution of this study.

5. Can the flaws in this manuscript be remedied in a revision? Separate from the determination of overall importance is the issue of "Can the manuscript be improved?" All research is inevitably flawed, and that despite an investigator's best efforts, flaws will remain in every published study. Although the initial version of a manuscript may contain many problems and would require extensive reworking, *EJSS* Action Editors are encouraged to invite a revision if (a) the manuscript has the potential to make a significant contribution to the literature and then

(b) There is a reasonable chance that all the serious issues could be successfully addressed. So, if a manuscript is not potentially important certainly, if there is a "fatal flaw" in the study, it cannot be accepted.

The crucial point is that your recommendation to reject the manuscript or invite a revision should hinge primarily on your judgment about
(a) Importance and only then on
(b) Whether it is possible to address all the major flaws you have found in a revision. It can be more kind to the author to recommend rejecting a manuscript the first time around rather than to invite revisions that have little chance of correcting the identified flaw(s).

3. Author's Guide

3.1. Ethical Guidelines for the author(s)

The following ethical guidelines are obligatory for all author(s) violation of which may result in application of penalties by the editor, including but not limited to the suspension or revocation of publishing privileges. Code of conduct for authors is designed to provide a set of minimum standards which should be followed by the editors of EYSA journals.

3.2. Reporting Standards

Authors reporting on original research are required to present their work in the correct manner in accordance with the patterns of scientific and academic communication and in the context of previous research and offer an objective discussion of its significance and importance.

The authors are also required to describe the methods and present the results in a clear and unambiguous manner.

The paper should contain enough details and references to permit the others to check the work.

Fraudulent or intentionally presented false claims represent unethical behavior and are unacceptable.

When an author discovers a significant error or inaccuracy in his published work, his or her commitment is to notify the editor or publisher without delay and cooperate with the editor to cancel or correct the work. If an editor finds from a third party that a published article contains a significant error, the author's obligation is to withdraw or correct the work without delay or provide evidence to the editor about the validity of the original work.

Overviews and professional articles must also be precise and objective and the works that include the views of the editorial board should be clearly indicated.

An author should recognize that journal space is a precious resource created at considerable cost. An author therefore has an obligation to use it wisely and economically.

It is the author(s)' responsibility to ensure that the research report and data contain adequate detail and references to the sources of information in order to allow others to reproduce the results.

Fragmentation of research reports should be avoided. A scientist who has done extensive work on a system or group of related systems should organize publication so that each report gives a well-rounded account of a particular aspect of the general study. Fragmentation consumes journal space excessively and unduly complicates literature searches. The convenience of readers is served if reports on related studies are published in the same journal, or in a small number of journals.

An author's central obligation is to present an accurate account of the research performed as well as an objective discussion of its significance.

3.3. Access to information and storage of material

If any question arises about the accuracy or validity of the research work during the review process, the author(s) should provide raw data to the Editor. Authors may be asked to provide basic information related to the work for the purpose of editorial reviews and they should be willing to allow public access to such information, if possible, and keep such information for a reasonable time after its publication.

A primary research report should contain enough detail and reference to public sources of information to permit the author's peers to repeat the work. When requested, the authors should

make a reasonable effort to provide samples of unusual materials to other researchers, with appropriate material transfer agreements to restrict the field of use of the materials so as to protect the legitimate interests of the authors.

3.4. Ethical requirements

Formal and documented ethical approval from appropriate research ethics committees are required for all studies using people, medical records and anonymized human data. Fully informed consent should always be sought where possible from all participants, otherwise an ethics committee should decide if the work is acceptable.

Privacy of Participants

Information obtained privately, as in conversation, correspondence, or discussion with third parties, should not be used or reported in the author's work without explicit permission from the investigator with whom the information originated. Information obtained in the course of confidential services, such as refereeing manuscripts or grant applications, should be treated similarly.

Authors should cite sources that have strongly influenced the content of research and manuscript. Information obtained privately, for example, in a conversation, correspondence or discussion with third parties may not be used or transferred without the express, written permission of the source. The information obtained during the performance of confidential services, such as the peer review of project applications for funding may not be used without the express written permission of the author of the work that has been the subject of such services. Authors must respect the privacy of the participant of research and must not use any information obtained from them without their informed consent.

- Authors should ensure that only information that improves understanding is shared.
- Authors must ensure that in instances where the identity of the participant needs to be revealed in the study, explicit and informed consent of the concerned party is obtained.
- In the case of the demise of a participant, consent must be obtained from the family of the deceased.

An experimental or theoretical study may sometimes justify criticism, even severe criticism, of the work of another scientist. When appropriate, such criticism may be offered in published papers. However, in no case is personal criticism ever considered to be appropriate.

Images

- The author(s) should ensure that images included in an account of research performed or in the data collection as part of the research are free from manipulation,
- The author(s) must provide an accurate description of how the images were generated and produced.

Specific permission for facial photographs of Athletes or study participants is required. A letter of consent must accompany the photographs in which a possibility of identification exists. It is not enough to cover the eyes to mask identity.

Contributors are required to follow the procedures in force in their countries which govern the ethics of work done with human subjects. The Code of Ethics of the World Medical Association (Helsinki Declaration) represents a minimal requirement. When experimental done for human subjects, describe their characteristics.

For human participants in a research survey, secure the consent for data and other material verbatim quotations from interviews, etc to be used.

Laboratory and clinical research should be driven by protocol; pilot studies should have a written rationale. Protocols must be carefully agreed by all contributors, including if appropriate the participants. Any unusual hazards inherent in the procedures, equipment, chemicals, or techniques used in an investigation should be clearly identified in a manuscript reporting.

3.5. Originality plagiarism and acknowledgment

Acknowledgment of Sources

An author should identify the source of all information quoted or offered, except that which is common knowledge.

A paper must always contain proper acknowledgment of the work of others, including clear indications of the sources of all information quoted or offered, except what is common knowledge.

The author(s) must also acknowledge the contributions of people, organizations and institutes who assisted the process of research, including those who provided technical help, writing assistance or financial funding (in the acknowledgement).

It is duty of the author(s) to conduct a literature review and properly cite the original publications that describe closely related work.

An author should cite those publications that have been influential in determining the nature of the reported work and that will guide the reader quickly to the earlier work that is essential for understanding the present investigation. This requires sufficient references to contextualize the work within its research context.

Citation of work may be omitted if the author feels that it is not influential to the outcome or analysis of the reported work. Except in a review, citation of work that will not be referred to in the reported research should be minimized. An author is obligated to perform a literature search to find, and then cite, the original publications that describe closely related work. For critical materials used in the work, proper citation to sources should also be made when these were supplied by a non-author.

It is the author(s)' responsibility to ascertain that s/he has submitted an entirely original work, giving due credit, by virtue of proper citations, to the works and/or words of others where they have been used.

Authors should try to write a completely original work, and if they have used the work and/or words of others, they must precisely cite or quote them. Plagiarism in all its forms is considered unethical publishing behavior which is not acceptable.

Plagiarism can appear in many forms, from "imposing" other people's work as the author's own, copying or paraphrasing relevant parts of the works of others (without citing the original author) to contributing the results of other people's research to themselves.

Material quoted verbatim from the author(s)' previously published work or other sources must be placed in quotation marks.

Authors are obliged to obtain permission from the copyright holders to publish illustrations, photographs, tables and other materials protected by copyright laws. Copyright-protected material may be reproduced only with proper permission and acknowledgement.

As per EYSA policy, in case the manuscript has a similarity index of more than 19%, it will either be rejected or left at the discretion of the Editorial Board for the purposes of a conditional acceptance.

3.6. Multiple or simultaneous publication

It is improper for an author to submit manuscripts describing essentially the same research to more than one journal of primary publication, unless it is a resubmission of a manuscript rejected for or withdrawn from publication.

It is generally permissible to submit a manuscript for a full paper expanding on a previously published brief preliminary account (a “communication”, “conference report” or “letter”) of the same work. However, at the time of submission, it should be made aware with earlier communication, and the preliminary communication should be cited in the manuscript.

Authors should not submit a manuscript that describes the same research in more than one journal or primary publication at the same time

except if a re-submission of a rejected or withdrawn manuscript is.

Authors should not submit a previously published paper.

Simultaneous submission of the same manuscript to more than one journal is considered unethical behavior in publishing and is not acceptable. Publishing of certain types of articles (e.g. translations) in more than one journal is sometimes justified, assuming fulfillment of certain conditions.

Authors may re-publish previously conducted research that has been substantially altered or corrected using more meticulous analysis or by adding more data.

The authors and EYSAJ editors must agree to the secondary publication, which must cite the primary references and reflect the same data and interpretation of the primary document.

3.7. Authorship

Authorship Credit

Authorship of the work may only be credited to those who have made a noteworthy contribution in conceptualization, design, conducting, data analysis and writing up of the manuscript.

It is the responsibility of the corresponding author to include the name(s) of only those co-authors who have made significant contributions to the work.

The corresponding author should ensure that all co- authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Other contributions should be indicated in a footnote or an "Acknowledgments" section. An administrative relationship to the investigation does not of itself qualify a person for co-authorship (but occasionally it may be appropriate to acknowledge major administrative assistance).

Deceased persons who meet the criterion for inclusion as co-authors should be so included, with a footnote reporting date of death.

No fictitious name should be listed as an author or co-author. The author who submits a manuscript for publication accepts the responsibility (as corresponding author) of having included as co-authors all persons appropriate and non in appropriate.

The submitting author should have sent each living co-author a draft copy of the manuscript and have obtained the co-author's assent to co-authorship of it.

3.8. Communication with editors and reviewers

Authors are expected to respond professionally and timely to editorial and reviewer comments. If an author decides to withdraw the manuscript that was already submitted to the review process or is not ready to accept the reviewers' suggestions, he or she should immediately notify the editor.

3.9. Disclosure of data and conflict of interest

The authors should in their work disclose any financial or other significant conflict of interest that could influence the results or interpretation of their work.

The manuscripts must be clearly state all the organizations who have given support to the research and all sources of funding and their possible role in conducting research and processing and publication of its results. If the funding source is not clearly stated, it is considered that the financial costs of research and preparation of the work are covered by the author himself or herself.

Examples of possible conflicts of interest that should be disclosed include employment, consultancy, stock ownership, honoraria, paid expert testimony, application and registration of patents and grants or other funding sources. Potential conflicts of interest should be published at the earliest possible stage.

Potential conflict of interest, e.g., a consulting or financial interest in a company, that might be affected by publication of the results contained in a manuscript. The authors should ensure that no contractual relations or proprietary

considerations exist that would affect the publication of information in a submitted manuscript.

All sources of financial support for the project should be disclosed alongside a brief overview of the role played, if any by the responses during various stages of the research.

3.10. Manuscript acceptance and rejection

The review period can last between 1-3 months or longer and during this period the author(s) reserve the right to contact the Editor Board to ask about status of the review.

Once the review process has been completed, the author will be informed about the status of the manuscript which could either be an acceptance, rejection or revisions. In the case of rejection, the author(s) reserves the right to publish the article elsewhere.

In case of revisions, the author(s) must provide an exposition of all corrections made in the manuscript and the revised manuscript should, then, go through the process of affirmation of revisions and be accepted or rejected accordingly.

In case of dissatisfaction over the decision of rejection, the author can appeal the decision by contacting the Editor.

3.11. Declaration

Authors are required to provide an undertaking / declaration stating that the manuscript under consideration contains solely their original work that is not under consideration for publishing in any other journal in any form.

Authors may have to sign an agreement allowing the journal to reserve the right to circulate the article and all other derivative works such as translations.

Authors may submit a manuscript previously published in abstracted form, for e.g. in the proceedings of an annual meeting, or in a periodical with limited circulation and availability such as reports by the Government agencies or a University.

A manuscript that is co-authored must be accompanied by an undertaking explicitly stating that each author has contributed substantially towards the preparation of the manuscript in order to claim right to authorship.

It is the responsibility of the corresponding author that s/he has ensured that all those who have substantially contributed in the manuscripts have been included in the author list and they have agreed to the order of authorship.

3.12. Manuscript submission

Any submission follows the manuscript guiding formats of EYSAJ. EYSAJ follows the writing formats used in most scientific journals. The Publications Handbook & Style Manual is the official guide EYSAJ acknowledge for preparing and editing papers.

Creating the Manuscript File

Because Microsoft Word files are required for editing of the text, it is preferred that authors submit the manuscript as a Word file. The figures may be submitted as PDF, EPS, TIF, or JPEG files.

Word Limits

Papers should be a maximum of 7000 words, including abstract, headings, tables, and figures, where each table or figure (including table titles and figure captions) is equivalent to 300 words (600 for large tables and figures that take up an entire page). The suggested word limit for Technical Notes and Preliminary Communications is 4000 to 5000 words, including tables and figures (each of which count for 300 words) and excluding references. Word limits do not apply to introductory papers to special sections.

Accepted manuscripts are prepared for typesetting using Microsoft Word. Therefore, authors are strongly encouraged to use this software during manuscript composition. Rich-format text, PDF and TeX files are not acceptable. The file must be double-spaced and line numbered. The file should contain the following elements:

Title and Byline

A short (12 words or less, not counting conjunctions, prepositions, or articles) title that accurately identifies and describes the manuscript content.

The title should represent the article's content and facilitate retrieval in indexes developed by secondary literature services. The terms in the title should be limited to those words that give significant information about the article's content. It is best to start the title with key words—not with words such as "Effect of" or "Influence of." Many readers peruse titles in a journal's table of contents to decide whether to read a given paper. A good title briefly identifies the subject, indicates the purpose of the study, and introduces key terms or concepts.

Keep titles free of nonstandard abbreviations, chemical formulas, or proprietary names, and avoid unusual or outdated terminology. Use common names.

Series titles are used infrequently. Articles in a series are not discouraged as such, but the editors need to be assured that all papers in the series are available for review and that the reader will be able to obtain earlier and later material in that series.

Titles may be descriptive (e.g., Variables A and B under C Conditions), declarative (A Relates to B in C Manner), or even a question (Does A Do X?).

Author–paper Documentation (addresses / affiliations, email address of the corresponding author, etc.).

Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.

The author–paper documentation appears on the first cover page of the published article. The purpose is to give addresses for all authors and an email address for the corresponding author (author documentation), **Title**, **the date the paper was received for review**, **the date the paper was accepted**, and **any necessary institutional identification** such as a **grant support, dissertation requirement, or a journal article number** (the paper documentation) and **surname, with professional titles**.

Word count List the total number of words used in the paper - which includes the abstract, footnotes, references, and tables. This number should not exceed 7,000 words.

• **Author names and affiliations.** Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name, and, if available, the e-mail address of each author.

• **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address.

• **Present/permanent address**. If an author has moved since the work described in the article was done, or was visiting at the time, a "Present address" (or "Permanent address") may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

In the manuscript, put this paragraph after the byline or on the cover page only.

Alternatively, any necessary institutional identification can be placed in the Acknowledgments section. If all authors are at one address, do not repeat the names in the documentation. Otherwise, group together all authors at a single address in the order they appear in the byline. **Give only initials and**

surname, without professional titles. The titles remain at the cover page or acknowledgments section.

Following complete addresses for all authors, give any sponsoring institutional information, with brief addresses; and lastly "*Corresponding author" (immediately followed by that person's email address in parentheses). Headquarters will provide the received and accepted dates for accepted papers.

Example:

Amensisa k. Legesse, and Tefera Tadesse*

3.13. Authorship

We encourage the use of full names in by lines (e.g., Amensisa k. Legesse, A. Kebede Legesse or Amensisa Kebede Legesse instead of A. K. Legesse OR Amensisa Kebede L.).

The first person listed in the title is, by definition, the corresponding author deals with proofs and, after publication, with reprint requests.

An asterisk (*) follows the name of the corresponding author in the byline, matched to the words "*Corresponding author" at the end of the author–paper documentation paragraph. Following standard American rules of punctuation, the asterisk comes after any comma (e.g., Frances L. Dudeck, Sayeed S. El-Marhawi,* M. Agnes Santello, and Vernon S. Foell). The authors of the paper decide the sequence of author names; the order should be agreed upon by all authors involved.

3.14. Parts of a manuscript

Abstract

A journal abstract has two typical uses. Printed at the head of a scientific paper, an abstract helps readers decide whether to delve into the paper; abstracts are also published via abstracting and indexing services. Because the abstract will be seen and read by many more people than will read the paper, everything that is important in the paper must be reflected in the abstract.

Include an informative, self-explanatory abstract. The abstract should be a single paragraph. It should be specific, telling why and how the study was made, what the results were, and why they were important. The abstract should read like a "mini-manuscript" with 1 to 2 sentences each for a justification/rationale, objective(s), methods, results, and conclusion. Present the most significant results and use quantitative terms where possible.

The abstract should call attention to new techniques, observations, or data. Be specific.

Use an **informative abstract** (also called a substantive abstract) presents the paper in miniature, complete within itself. It moves from an introductory statement of the rationale and objectives or hypotheses, through materials and methods, to the results and conclusions. (A descriptive abstract is more like a table of contents for the paper and is rarely used in scientific publications except, perhaps, for review or opinion papers.) A number of books and articles offer useful advice on preparing abstracts (e.g., O'Connor and Woodford, 1976; O'Connor, 1979; Day, 1988), and

An internet search for "informative abstract" is likely to have recent course materials on scientific writing among the results. Because an informative abstract has to stand alone, do not deflect the reader with phrases such as "will be discussed" or "will be explained." For the same reason, do not include reference, figure, or table citations. Equations also are inappropriate in an abstract unless they are the central finding of the study. Limit your use of abbreviations and define the ones you do use.

Write the abstract as a single paragraph, with a limit of 300 words (~1500 characters) for manuscript and 600 words for full-length papers.

Introduction (including Objectives and literature Review)

Use the introduction to review published literature and issues related to your topic. A thorough introduction helps the reader recognize what your research contributes to the current knowledge in your subject area. Begin your

article by clearly identifying its subject and state the hypothesis or definition of the problem designed to solve. Give a brief reference to previous concepts and research. Limit literature references to essential information, and do not rely on old references when newer are available. Keep the introduction short, but include:

(i) A brief statement of the problem that justifies doing the work, or the hypothesis it is based on;
(ii) The findings of others that will be further developed or challenged; and
(iii) An explanation of the general approach

Text

After the **Introduction (Objectives and literature)** the main text of the manuscript typically includes Materials and Methods, Results, Discussion, and a conclusion. The Results and Discussion sections may be combined into one section. The author(s) can :

(i) Include a separate conclusions section, which will appear as a subheading under the Discussion

(ii) Provide the conclusions (with no heading) at the end of the Discussion section. In either case, the conclusions should be no longer than 300 words or 600 words for full length paper. Within the 300 words, the conclusions and implications of the work should be provided. In some instances, no conclusions may have been drawn from the study. In this case, the implications of the study should be provided. In other words, if the author(s) decides to forego the inclusion of a conclusion subheading within the Discussion section, then the final paragraph of the Discussion section should provide the conclusions (if any) and the implications of the study.

(iii) Method and Discussion

Use the Discussion section to interpret your results. Give particular attention to the problem, question, or hypothesis presented in the introduction. A good discussion typically covers most or all of the following steps:

1.sample variables are free of confounding influences (e.g., education is controlled for), recruitment and sampling techniques are appropriate,
2.measures are reliable and valid for assessing the variables of interest, and
3.the statistical procedures are appropriate and sufficiently sophisticated to
4.Examine the data and are carried out appropriately.
5.Relate the results to the original objectives.
6.Explain the principles, relationships, and generalizations if supported by the results.
7.Address any exceptions or lack of correlation that qualify the findings, or difficulties that point to areas for further investigation.
8.Explain how the results relate to previous findings, whether in support, or contradiction, a.
9.Present conclusions supported by a summary of the evidence. The Discussion section should focus on the meaning of your findings, not recapitulate them. Scientific speculation is encouraged, but it should be reasonable, firmly founded in observation, and subject to tests. It must also be identified as such. Where results differ from previous results for unexplained reasons, possible explanations should not be labored. Controversial issues should be discussed clearly and fairly.

(Iv) Tables: - usually show numerical value or textual information and are almost always characterized by a row-column structure. Any type of illustration other than a table is referred to as a figure. Compose tables using the word processor's table feature (i.e., the table should have defined cells—do not create tables by using the space bar and/or tab key). Tables should not duplicate matter that is presented in figures. Use the following symbols for foot notes in the order shown: †, ‡, §, ¶, #, ††, ‡‡, etc. The symbols *, **, and *** are always used to indicate statistical significance at the 0.05, 0.01, and 0.001 probability levels, respectively, and are not used for other footnotes. As with figure captions, spell out abbreviations on first mention.

Number

Number tables sequentially (i.e. If you have more than one table in your writing) e.g. Table 1, Table 2

Each table must be referred to in the text, using a capital T, for example: ...as shown in Table 1

Title

Place directly above the table itself and below the table number.

Brief clear and explanatory, in italics and with major words **capitalized** with no full stop.

Note

Place directly below the table, the word "Note" in italics with a full stop, for example: *Note.*

(V) Figure captions and tables should be placed in the main text close to where they are first called out. (Figures may also be submitted separately as high-resolution image files in the following acceptable formats: EPS, TIF, PDF, or JPEG)

Caption:

When you use a figure that has been adapted or copied directly from another source, you need to reference that original source. This reference appears as a caption underneath the figure (image):

don't include a title on top - the caption is your title

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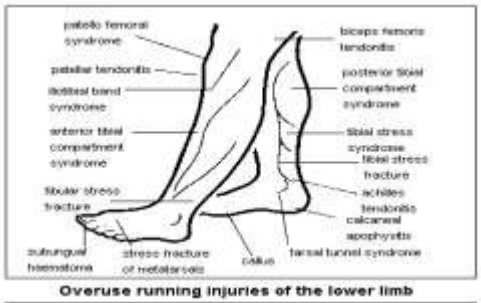
Number all figures with Arabic numerals in the order in which they are first mentioned in text, regardless of whether a more detailed discussion of the figure occurs later in the paper. For example, Figure 1...Figure 2...etc.

Refer to the figure in your writing - no italics, but with capital F, for example "In Figure 1..."

Figure.1



Overuse running injuries of the lower limb

Explain abbreviations, symbols etc

Acknowledge the source of the table

Include a copyright statement at the end of the note.

Ruling (Lines)

Limit the use of lines to those that are necessary

Appropriately positioned white space can be an effective substitute.

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VI. Acknowledgments (optional).

Brief acknowledgment of grant funding can be included in the documentation paragraph, but extensive support information and personal thanks belong in the acknowledgments section at the end of the paper.

VII. Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly, for tables and figures: Table A.1; Fig. A.1, etc. Vitae submit a short (maximum 100 words) biography of each author.

Supplemental Material paragraph, if applicable.

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University of Wisconsin automated weather observation network.

University of Wisconsin Extension. http://www.soils. wisc.edu/wimnext/awon/awon.html (accessed 18 Jan. 2012). SAS Institute. 2004.

User's guide: Statistics. SAS Inst., Cary, NC. last name first, followed

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Examples:

Journal article

Smith, D.T., D.L. Johnson, and J.K. Thomas. 2001. Phosphorus losses in irrigation runoff. J. Environ. Qual. 30:2569–2580.

Book

Lindsay, W.L. 1979. *Chemical equilibria in soils.* John Wiley & Sons, New York.

Chapter in a book (Book Section)

Nelson, D.W., and L.E. Sommers. 1982. Total carbon, organic carbon, and organic matter. In: *A.L. Page et al., editors, Methods of soil analysis*. Part 2. 2nd ed. Agron. Monogr. 9. ASA and SSSA, Madison, WI. p. 539–579

Official Sources

Spelling: Merriam-Webster's New Collegiate Dictionary

Chemical names: PubChem (https://pubchem.ncbi.nlm.nih. gov/)

Journal abbreviations: Chemical Abstracts Service Source Index (CASSI; American Chemical Society, http://cassi.cas.org/)

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Miscellaneous Dissertations and theses

Maraqa, M.A. 1995. Transport of dissolved volatile organic compounds in the unsaturated zone. Ph.D. diss., Michigan State Univ., East Lansing. Software and software documentation.

Abacus Concepts. (1991). Super ANOVA user’s guide. Release 1.11. Abacus Concepts, Berkeley,

CA. Minitab. (1998). MINITAB 12. Minitab, State College, PA.

SAS Institute. 1994. The SAS system for Windows. Release 6.10. SAS Inst., Cary, NC. ‘Encyclopedia article.

Encyclopedia of plant physiology. Vol. 12A. Springer, Berlin. p. 135–167.

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