

**RISK MANAGEMENT IN KITESURFING AS A BASIC CONDITION OF EFFECTIVE LEARNING AND SAFE SWIMMING**

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**ABSTRACT**

This article discusses issues related to safety during kitesurfing (swimming on a board with a kite). The considerations are based on risk management procedures. These procedures can be described interchangeably as managing your own safety. Risk management allows you to minimize threats without sacrificing your planned sport goals. The authors first describe the procedures related to the identification of threats occurring in this discipline. Teaching and practicing kitesurfing involves overcoming a large number of threats. These threats can have both external and internal character. The next stage is risk analysis, understood as the product of negative events and the probability of their occurrence. Afterwards, we discuss the ways of dealing with the threat in the event of its occurrence. The last stage is the risk control (tracking) - whether new threats have emerged, or the level of risk has remained unchanged. The described methodical impacts can be labelled as education for safety.

**Keywords:** kitesurfing, risk, safety, education for safety.

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## INTRODUCTION

Safety is the reverse of danger. It is perceived as a condition characterised by a low level of risk of losing something particularly valuable - life, health, work, respect, feelings, material or intangible goods, etc. Giving a sense of confidence to a man is one of the basic needs in Maslow's pyramid [1]. This work is an excerpt of extensive research related to safety in various areas of physical culture. Safety issues have a special importance in forms of activity where risks to the health or life of the participants is very high.

One such activity is kitesurfing, which has just been included as a sport discipline in the program of the Paris 2024 Olympic Games. "Although the first reports on the use of kites for the propulsion of boats reach back as many as several hundred years BC, it was not until the beginning of the 19th century, that the desire to use the kite has gained momentum. The history of kitesurfing is relatively short, but very rich" [2].

When speaking about water sports today, kitesurfing cannot be omitted. While a few years ago, kites appeared on several water areas, today, on a windy day, they constitute a significant percentage of the users of each spot.

The popularity of the sport is determined by many factors. It is very spectacular, like snowboarding for example. It is included in the group of extreme sports (although - thanks to progressions in the design of the equipment - it is very safe today). It stirs up emotions, both of the spectators and of the flying kite surfers themselves.

„The specificity of kitesurfing is also based on mobility - the kite together with the equipment can easily be packed into a backpack, the board picked up and moved without any problems, which is not so easy with many other water sports" [3].

Additionally, it introduces the third dimension and thus the possibility of rising into the air and staying there for several seconds at times.

The kitesurfing market in Poland has developed strongly over the last 10 years.

Many schools appeared, teaching kitesurfing on the Polish sea - in the summer of 2018 there were over 60 of them. According to estimates, in the last summer season, 200 people have learned to swim in each school, whereas in the last 3 years alone, the number of new

people (learning - entering the sport) in kitesurfing in Poland is estimated at around 35,000. It should be taken into account that some people learn kitesurfing alone, while others participate in courses during trips to warm countries.

Interest in kitesurfing has been growing significantly over the years, which means that in the following years the number of those interested in learning this sport will increase.

One of the proofs that the popularity of this sport is growing is the fact, that outside of Poland there are already many established Polish kitesurfing schools in places such as: Tarifa, El Gouna (Egypt), Rhodes, Paros (Greece) and many Poles teach kitesurfing e.g. in Cabarete, Cape Town.

The aim of the considerations is to analyse the basic principles of education for kitesurfing safety, based on risk management procedures. These procedures can also be labelled as managing their own safety, because this is what risk management ultimately means.

Education for safety in kitesurfing is a pedagogical process aimed at mastering the ability to control one's own actions while surfing, in the context of ensuring full safety. The work presents methodical steps related to educational activities and their methodological justification.

## RISK MANAGEMENT PROCEDURES

The analysis of the phenomena related to safety requires a clarification of this concept. They can be interpreted as a state (feature, property) of safety understood as a process (dynamics, changeability, development). Secondly, safety should be considered in the context of a specific situation, where the important factors are entity (who or what?), the subject of safety (which field of human activity is considered?) and space (at what time and where the action takes place?). In this study, safety is discussed in the context of people who practice kitesurfing.

Safety is the reverse of danger. All activities are accompanied by risk. Risk means the probability of an event occurrence, which can lead to losses. It is therefore considered a product of the probability and severity of the effects (Fig. 1).

Risk	Probability of an event occurrence	Effects of the event
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Fig. 1 Diagram illustrating the measure of the magnitude of risk in a given action. Own study.

Risk management procedures are the basis of the emergency services operations, in catastrophic and natural disaster situations. They are used in secure management of enterprises, finances, communications, It, insurance or logistics. The effectiveness of these procedures in the indicated areas allows to assume that the risk management skills will help to predict the risks and control their negative effects.

Risk management allows to reduce the impact of negative events on our actions, and even to reduce the occurrence of these events [4,5,6]. In this study, we use the term safety management interchangeably because it has a significant educational meaning.

Risk management includes actions consisting of:

- Risk identification;
- Risk analysis;
- Planning the ways to deal with risk;
- Tracking risk.

## IDENTIFICATION OF RISK (DANGER) IN KITESURFING

Identification is understood as the recognition of a threat and its elements, the detection of sources of danger, its characteristics and classification. The result of this stage is an identified list of risks.

- Which negative events can occur during specific kitesurfing activities?
- What are the negative consequences of this threat?
- What do we risk when undertaking kitesurfing lessons or practicing kitesurfing?

"Kitesurfing is a safe sport on the condition that people who practice it are secure and follow all the rules of the sport. Over a dozen years of kitesurfing history show that all the accidents that took place resulted from the inadequate actions of people - their recklessness, lack of proper preparation (e.g. lack of knowledge in the field of meteorology), etc. This is why so much time is being reserved for the topic of safety during kitesurfing courses in schools, as well as the kitesurfing instructor courses.

Surfing alone is very easy - with the right wind conditions, surfing in a slip with a face full of joy can be achieved after 2-3 days of training. However, it is not possible to learn safe surfing from books or from movies. When learning kitesurfing, it is necessary to join a course at a kitesurfing school or undertake supervised lessons with a qualified instructor. Only this way, consisting of both the assimilation of theory and the practicing of manoeuvres several times over, guarantees surfing pleasure as well as "conscious" behaviour in difficult situations" [2].

Risks can have external and internal character [1].

### EXTERNAL RISKS

During the training for surfing on a board with a kite, one should aim at predicting objective threats. It is a difficult task because it requires knowledge and extensive experience. External threats come from sources on which we have no direct influence. The largest ones include weather conditions and the situation in the immediate area of water being utilised (Table 1).

### INTERNAL RISKS

Kitesurfing, like any other sport, involves the risk of dangerous situations developing. How many of them will occur and what will their consequences be - everything depends on the kitesurfers themselves; on their skills, knowledge and the ability to use their experience in practice. It can therefore be concluded that internal risks lie in the kitesurfers themselves (Table 2). The risks depend on, and very often, are caused by the kitesurfer themselves. Internal risks should have a greater impact than external risks. However, most people are unable to control and make an objective self-assessment of internal risks. Self-discovery, overcoming panic and one's own weaknesses is not an easy process. As a result, the identification of internal risks is inaccurate and the resultant risk of an incident is very high. This is the primary task for those providing education in the safety of kitesurfers.

Tab. 1

Exemplary list of external risks during learning and practicing of kitesurfing.

Category	Examples of internal risks
The actions of other people	Instructor mistakes. Partner errors during belaying at the learning stage. Actions of other users of the water area (not only kitesurfing). Overcrowded water area. Disregarding the rules of safe (mainly regulations regarding the movement on water). Different level of advancement of the water area users.
Place of learning and surfing	Incorrectly selected places to learn and surf (depth, density, shape of the bottom, reef, ...). Proximity of obstacles. Wind effects. Dangerous fauna.
Atmospheric conditions	Storms, strong winds. Low temperature of air and water. High temperature of air. Weather variability - especially wind speed.
Equipment and devices	Equipment failure (board, kite, ropes, steering rod). Improper use of equipment. Technical defects of the equipment.

Exemplary list of internal risks during learning and practicing of kitesurfing.

Category	Examples of internal risks
Health condition	Mental and physical discomfort. Injuries limiting functionality and physical fitness. Illness and other disorders.
Level of skills and physical fitness	Low or non-existent swimming skills. Low level of competence. Ignorance of safety rules. Inexperience. Low physical fitness.
Mistakes during surfing	Failure to comply with safety rules (including the rules regarding movement on water areas). Errors in using the equipment.
Mental properties	High level of emotional states. Personality traits that make learning and surfing difficult. Lack of concentration. Recklessness and lack of self-esteem.

An ideal moment for teaching risk identification skills is the initial period of each subsequent stage of kitesurfing training - in parallel with the implementation of the motivation process.

### RISK ANALYSIS OF AN EVENT OCCURRENCE

Risk analysis can be carried out using two methods, quantitative and qualitative [1]. Quantitative methods are based solely on statistical data. Descriptive

(qualitative) methods are subjective because they rely on human assessment. One should answer a few questions:

- What is the probability that the predicted event will occur?
- Can we avoid the event or at least minimize its effects?
- What is the cost of reducing risk?

In the process of learning kitesurfing or swimming, a method of qualitative risk assessment can be applied. (Table 3).

Tab. 3

A simplified risk matrix estimated by descriptive methods. Risk on the 1-2 level is accepted (ignored); risk on the 3-4 level is accepted (but monitored); risk on the 6-9 level can be accepted only exceptionally, and when taking into account the contingency plan. Self study based on Rudnicki [7].

Severity of effects Probability	Level low 1	Level medium 2	Level high 3
High 3	3	6	9
Medium 2	2	4	6
Low 1	1	2	3

Education for safety in kitesurfing requires an independent risk analysis. Each action taken generates other values of the risk taken. In addition, the most important factors are the individual characteristics of any given kitesurfer and third parties (instructor, other users of the water area).

The most important rules of education for safety when practicing kitesurfing include:

#### 1. RESPECT FOR OTHER PEOPLE

Each kitesurfer should behave in a way that does not pose a threat to another person.

#### 2. CONTROL OVER SPEED AND JUMPS

A kitesurfer should match his speed to his abilities and always be mindful of his ability and the amount of other traffic on the water.

#### 3. RESPECTING THE MOVEMENT RULES OF THE WATER AREA

It is imperative to abide the movement rules of the water area - kitesurfer surfing on a tack or making a turn and jump must choose a track and a place to keep the movement rules of the water area.

#### 4. OVERTAKING

Overtaking can be done at leeward and windward, at such distance that will give the overtaken sufficient space for all its manoeuvres.

#### 5. COMMENCING OF MOVEMENT

A kitesurfer, who begins a tack after stopping, has the duty to check whether he can do so, without creating danger to himself and the others.

#### 6. STOPPING

Avoid sudden stops, sudden turnovers while surfing, and stopping and staying at the exit and entry point on to the water.

**7. ENTERING AND EXITING THE WATER**

Kitesurfer should only enter and exit the water at designated sites or areas that are safe in terms of the ground, wind direction, etc.

**8. ACCIDENTS**

In the event of an accident, everyone nearby should help the victim.

**9. CHOOSING A PLACE TO LEARN, SURF, JUMP**

Regardless of the level of advancement, the place of learning, sailing or jumping should be the least crowded, separated (marked) and safe in terms of terrain, bottom and wind conditions. Look for secured places. Stay away from boats, nets and other dangerous obstacles.

**10. CHOOSING THE KITE**

The kite should be selected according to the wind conditions and skills. One should never experiment with the size of a kite, especially with strong and uneven wind.

**11. RESPECT FOR WEATHER CONDITIONS**

Atmospheric conditions should be observed and analysed, changes should be anticipated and proper reactions to possible threats resulting from these changes taken.

**12. SAFE BASE**

Remain for as short a time as possible with a "launched" kite on land. Water is a much safer base.

**13. SAFETY SYSTEMS**

Use kites with several efficient safety systems. You should check the operation of these systems from time to time, know the principle of their use. Under no circumstances should you experiment with your own "patents" of safety.

**14. ASSURANCE - AFFILIATE SYSTEM**

Avoid sailing alone - sail in the company of partners (friends), at the spots with safety systems in the water and on land.

**15. THE KITE - IN THE DANGEROUS SITUATION IS THE MOST IMPORTANT**

In dangerous situation, problems with controlling the board, one should focus on the kite - control its piloting, reduce power and if it does not bring the desired effects, use a safety system. One should not focus on the board at all costs when you do not control the kite.

**16. ROPES**

Avoid situations where the ropes of the kite become loose in the air. Loose ropes prevent steering and therefore control of the kite.

Never grab two or more ropes attached to the kite, regardless whether the kite is in the air, lying on the water or on the beach. Every now and then you should check (especially when launching a kite) if the ropes are not braided/crossed. Never enter (a person floating or bystander) between kite ropes which are lying on the water.

**17. RUSH VS. CALM**

During preparation of the kite, connecting it to the trapeze, launching the kite and swimming, one should not rush. Haste often causes details to be overlooked, mistakes made, which is not acceptable in kitesurfing!

**18. INSURANCE**

It is worthwhile having insurance for yourself when kitesurf. For Poland, you should obtain accident insurance (NNW) and civil liability (OC). When travelling abroad, it is worth to obtain additional insurance for medical treatment costs (KL).

**19. SAFETY EQUIPMENT**

Safety equipment should be used on every level of advancement. It usually includes a helmet, a lifejacket and a knife.

**20. BETTER TO ASK THE WAY THAN GO ASTRAY**

There is no place for hesitation in kitesurfing. If we are not sure about something, we should always ask experienced surfers, regardless of our level of advancement. In kitesurfing everyone should take care of safety, support each other with their experience and stigmatise those who hesitate to ask for assistance when needed.

**21. EQUIPMENT HANDLING**

Kitesurfing equipment wears out just like any other equipment. It should be taken care of, the condition checked frequently (operation of safety systems, condition and length of ropes), and properly maintained after use (folding, storing). Do not store in risky spaces or in a dangerous way - for example, a board left on the beach with fins positioned upwards.

**22. KNOWLEDGE AND AFTERTHOUGHTS**

There is never too much knowledge, especially in kitesurfing. Expand your knowledge continuously and combine it with practice.

Before every action, it is necessary to consider what the consequences of this action may be. This applies mainly to the youngest kitesurfers, whose "lack of imagination" often leads to accidents.

**23. WIND WINDOW**

It is necessary that, during the exercises or surfing, no one should remain in the wind window (part of the sphere (1/4), the space in which the kite operated by the kitesurfer can move). Especially in the power zone (the part of the wind window located directly in front of the kitesurfer, in which the moving kite generates maximum power). The floating kite is very dangerous in the mentioned zone [2].

For different people and situations, the estimated risk will vary. The sequence of such methodical proceedings is illustrated in the next figure (Table. 4).

Risk analysis of five sample negative events while learning kitesurfing and independent surfing. Own study.

<b>Negative event</b>	<b>Reason of the event</b>	<b>Consequence</b>	<b>Action taken</b>	<b>Risk analysis</b>
1. Equipment damage – e.g. breaking of the steering line.	Lack of controlling and servicing of the equipment.	Lack of control over the kite, uncontrolled flight of the kite.	Self-rescue – the use of the safety system.	Frequent accidents, various consequences.
2. No possibility of returning to the starting point (tacking against the wind).	Poor kite selection for the particular wind conditions, change of the wind, speed or kite trimming system failure.	Loss of altitude at the water area, swimming into a dangerous area (e.g. deep water).	Self-rescue, assistance of third parties.	Anticipated long period of time awaiting rescue – slow return to the starting point/shore.
3. Collision with another kitesurfer or windsurfer.	Third party actions or ignorance of the movement rules in the water area, lack of skills.	Lack of control over the kite, impact, injury.	Self-rescue, assistance of third parties.	Frequent event, requiring the use of safety system and crucially the assistance of third parties.
4. Body temperature reduction.	Wrong selection of clothing, prolonged stay in the cold water (during learning/improvement), low intensity of classes (e.g. change of students on one kite).	Hypothermia.	Warming of the victim, emergency services assistance in case of further body temperature reduction.	Depending on the degree of hypothermia, appropriate treatment should be implemented.
5. Incorrect belaying.	Partner error or equipment defect.	Kite flying over the water, fall, impact, injury, entanglement in the kite ropes.	Self-rescue, assistance of third parties.	Frequent incident, necessity to use a safety system, necessity to be assisted by third persons, depending on the severity of the suspected injury, implementation of an appropriate procedure.

## PLANNING WAYS OF DEALING WITH RISK

Risk identification and analysis allows for the development of a plan of action in the event of an increased risk or emerging threat. The following strategies are possible: (Table 5) [1].

- **Risk avoidance** – it is practically a resignation from surfing, and thus resignation from planned achievements. It is legally sanctioned by normative bans.
- **Risk taking** – accepting the risk with all the consequences it brings with it. In this plan, it is necessary to take into account the costs of the actions taken - both material and health costs. Taking action and accepting risk only makes sense when the level of risk is not high. The aim of education in the case of this strategy is to prepare for independent identification and analysis of risk and mastery of other ways of dealing with risk (see below).
- **Risk transfer** – a strategy of spreading and transferring the risk on to third parties. This amounts to:
  - ✓ Surfing with experienced kitesurfers;
  - ✓ Assignment of tasks adequate to the skills;
  - ✓ Transferring the risk onto the belayers, also on land;
  - ✓ Using the services of the instructor;
  - ✓ Personal accident insurance.

Transferring the risk onto experienced and skilful third parties results in a reduced level of risk. Transferring the risk onto the insurer provides a similar effect. Personal accident insurance (NW) or civil liability insurance (OC) helps with lowering the severity of the results of the taken risk. It is worth mentioning that the

insurer also estimates the risk, which is expressed in the level of the proposed insurance rates.

- **Risk compensation** – equalising ones own deficiencies and imperfections through the use of auxiliaries, belaying and rescue measures, e.g. the use of boat support during classes and surfing, the use of safety systems.
- **Emergency plans** – strategies prepared in case of high-risk taking.
- ✓ Rescue procedures. Most accidents on the water follow a similar pattern, although they differ in many respects. You can therefore predict their stages. Professional rescue services can develop standard operating procedures. Developing of such procedures is the responsibility of official units, such as the Fire Brigade, Voluntary Water Rescue Emergency Service (WOPR), SAR or Navy, as well as the Coast Guard Patrol. It is worth mentioning that the obligation to provide assistance to accident victims is expected from every adult person [8]. From a legal perspective, provision of assistance by third parties is limited by the competence in the scope of applied procedures. However, Basic Life Support skills are commonly required.
- ✓ Self-rescue – means rescuing yourself, in the event of an emerging threat. Self-rescue is effective when one remains calm and overcomes one's weaknesses. Only then can an assessment of the risk be done and appropriate self-rescue

actions taken. The foundation of self-rescue is self-control and self-assessment of one's own actions. Self-rescue is a useful skill, even for experienced kitesurfers.

Tab. 4

Possible strategies against risk during learning and practicing kitesurfing. Own study based on Kaczmarek [4].

p.	Possible strategies	Actions against risk	Risk level
	Risk taking	Accepting risk	Very high
	Own risk coverage	Emergency plans – equipment safety systems	High
	Risk diversification (transfer)	Modification of intensions	High
	Risk compensation	Applications of safety measures	High
	Risk transfer	Partner instructor rescuer, insurer	Small
	Risk avoidance	Resignation to learning/practicing	None

## TRACKING RISK CHANGES WHILE PRACTICING KITESURFING

While learning or practicing kitesurfing, the conditions on the water may change. This applies especially to weather conditions during prolonged stays on the water, although a change in wind conditions (increased wind speed) often leads to an increase in water density.

The final stage of the risk management strategy boils down to the following activities:

- Control of the course of study (lesson) or free sailing;

- Continuation of study (lesson) or free sailing in accordance with the plan, in the absence of new threats;
- Modification of the risk classification level in the case of emerging new threats;
- Development of a new response plan for the threat;
- Implementation of a new strategy.

The result of this stage is the control of risk, a modified list of risks and a new risk response plan. Information received during the last stage can be used during subsequent activities, but above all, they influence the improvement of the skill level and enriching the knowledge of sailing on a board with a kite.



## SUMMARY

Risk will always accompany kitesurfing (at the stage of learning, improvement and independent surfing), because objective threats cannot be completely eliminated. However, risk is not a pejorative concept.

Risk management allows the minimising of threats without giving up planned goals. 80% of the course when learning kitesurfing is dedicated to safety. The sailing technique alone is only 20% of the course content. Learning to surf requires meeting safety priorities in the form of specifically targeted methodological interactions - which could be described as safety education.

We believe that teaching risk management skills can be a very effective, and at the same time attractive, educational process. The effectiveness of such education requires the inclusion of future kitesurfers into the process of identifying threats, risk analysis, planning strategies for coping with risk, as well as tracking and controlling the course of undertaken actions. In the proposed safety education for kitesurfing, technical skills are developed, but also the ability of decision-making and the responsibility for one's own actions. Very important theoretical information is being passed on. Thus, safety education becomes a cognitive activity of the kitesurfer and the instructor.

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