

Roles of National Swimming Federations in Health Promotion: An International Comparison- Developed vs Developing Countries

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Summary

Purposes: To determine the profile of the medical personnel, the priorities and the activities/ researches of the National Swimming Federations of Developing and Developed countries with respect to the athletes' health protection and the promotion of health in the general population.

Method: A descriptive transversal study through a confidential survey that was circulated to the 208 FINA National Member Federations. A statistical validity and reliability was obtained (Cronbach α coefficient of 0.8642 for $n = 15$). The NFs were divided based on their economic level, NFs of developed ($n= 66$) and developing countries ($n=142$) following the classification of the Organization for Economic Co-operation and Development, (2016). Analysis: A statistic comparison of measures with the test U of Mann-Whitney was executed.

Results: 80 of the NFs from developing countries (56.3%) responded and 55 NFs from developed countries (83.6%). Evident differences were found in Presence of physiotherapists (Developing NFs: 31.2%, Developed NFs: 58.1%; $p<0.005$) and psychologists (11.2% vs 21.8%; $p=0.096$). Top priority for both groups was Performance of the elite athletes, however Increasing the numbers of elite athletes was of major importance for the Developing NFs (4.1 vs 3.95, $p <0.05$). The programs based around drowning prevention are the most prevalent of the programs run by both (58.7% vs 74.5%; $p=0.058$).

Conclusion: The NFs did not have the necessary personnel to promote the health of their athletes. Top priority for the Developed NFs was to Increase the numbers of elite athletes but they have low levels of Prevention of injuries programs. Coming back after an injury and Medical examination preparation were also low in Developed and in Developing NFs. Prevention of drowning program was the most frequent program/activity for health of general population, for the recreational athlete and "Save Sport" (without sexual abuse) they were questions of low priority for all of them.

Key words:

Swimming. Health. Sport Organizations. Developed & Developing Countries.

Rol de las Federaciones Nacionales de Natación en la promoción de la salud: Comparación países desarrollados vs en vía de desarrollo

Resumen

Objetivos: Determinar el tipo de personal médico, las prioridades y actividades para la protección y promoción de la salud de las Federaciones Nacionales de Natación (FNN) según su nivel económico y determinar si aplicaban los programas relacionados con la salud de la Federación Internacional de Natación (FINA).

Método: Se realizó un estudio descriptivo transversal mediante una encuesta confidencial distribuida a las 208 FNN adscritas a la FINA. La encuesta fue validada y se obtuvo su fiabilidad estadística (coeficiente α de Cronbach de 0,8642 para $n=15$). Las FNN se dividieron según su nivel económico en FNN de países desarrollados ($n=66$) y FNN de países en desarrollo ($n=142$) siguiendo la clasificación de la Organization for Economic Co-operation and Development (2016). Análisis: Se realizó una comparación estadística de las medias mediante la prueba U de Mann-Whitney.

Resultados: Respondieron 80 FNN en desarrollo (56,3 %) y 55 desarrolladas (83,6 %). Hubo diferencias en la presencia de fisioterapeutas (FNN en desarrollo: 31,2%, desarrolladas: 58,1%, $p <0,005$) y psicólogos (11,2% vs 21,8%; $p=0,096$). La máxima prioridad para ambos grupos fue el Máximo rendimiento de los nadadores de élite, aunque Aumentar el número de nadadores de élite era de mayor importancia para las FNN en desarrollo (4,1 vs 3,95; $p <0,05$). Los Programas de Prevención de ahogamiento fueron los más frecuentes en ambos grupos, pero con diferencias significativas entre ellos (FNN En desarrollo: 58,7% vs FNN Desarrolladas: 74,5%; $p=0,058$).

Conclusiones: Las FNN no disponían del personal necesario para promover la salud de sus nadadores. La mayor prioridad de las FNN en desarrollo era Aumentar el número de atletas de élite, pero tenían bajos niveles de Prevención de lesiones, Vuelta a competir tras una lesión y de Exámenes médicos preparticipación, aunque en las FNN desarrolladas también eran bajos. La Prevención de ahogamiento fueron los programas más frecuentes pero la Salud de la población en general, la del atleta recreativo y el "Deporte Seguro" (sin acoso sexual) eran cuestiones de baja prioridad para todas.

Palabras clave:

Natación. Salud. Organización deportiva. Países en desarrollo y desarrollados.

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Introduction

The International Swimming Federation (FINA), in association with UNESCO, UNICEF, the UN, and the IOC, among others, has created the "Swimming for all" programmes, whose key objectives are to reduce the global drowning rates and to promote a healthier lifestyle throughout the world¹. These programmes are indicators of how sport is becoming a means to promote health².

In developed countries, programmes such as USA Swimming ("splash at a time")³ and Australia Swimming ("Go swim")⁴ have been implemented to promote the health of the population through swimming and can be considered to be models to be followed by other National Swimming Federations (NSF). However, swimming is not accessible in the same way in all the NSF, given that each federation faces different barriers and challenges depending on its geographical location and socio-economic situation⁵.

The IOC is also showing its interest in the protection of the health of its athletes, in developed and developing countries alike⁶⁻⁹. Since the FINA 2009 World Aquatics Championships, studies have been made in relation to injuries and diseases¹⁰, but there is still room for improvement in the prevention of pathologies and injuries, specifically out of competition¹¹.

On the other hand, the levels of participation in international swimming events has increased significantly over the last 20 years. While only 46 NSF took part in the first edition of the FINA World Swimming Championships (25 m) in 1993¹², 168 NSF were present at the 12th edition of the FINA World Swimming Championships (25 m) in 2014¹³. However, participation in major swimming events may not be always related to the economic status of the NSF. The FINA, through its "Universality Rule", allows athletes from developing countries to take part in the World Championships¹⁴ even with no standard entry times, thereby giving them the opportunity to take part in major events. However some of these athletes are attending these competitions despite the fact that their national team has limited access to injury prevention programmes and has no support from a medical staff structure, given that not all the NSF have the same health promotion and injury prevention programmes, before and after major events. Those NSF with fewer resources may not have the same capacity to implement health promotion programmes.

The study objectives were: To determine whether the economic level of the NSF is related to the promotion of the health of the general public, whether the economic level influences the application of the health-related rules, projects and programmes of the NSF, and whether the NSF in developing countries attending international swimming events have an adequate medical structure.

Material and method

A universal descriptive study was made of all the NSF recognised by the FINA on 31/12/2014 through an on-line survey. The survey used was based on that published by the International Federation of Sports Medicine (FIMS) for the Sports Federations¹⁵ and on that by Mountjoy and Junge¹⁶ for the International Swimming Federations taking part in the 2014 Olympic Games and the 2016 World Championships.

Participants: The questionnaire was sent to the chairpersons, managers, general directors or head of the Medical Committee, where applicable, of the 208 NSF that are members of FINA. The survey respondents were informed that their responses would form the basis of the study and their consent was requested to use these responses in the dissemination of the results in scientific journals.

The identification of the developing countries (NSF in developing countries) and developed countries (NSF in developed countries) was based on the Official Statistics of the Organisation for Cooperation and Development¹⁷.

The survey was adapted to the specific objectives of this study and, for this purpose, a pilot study was conducted by two independent experts in the area of Sports Science from the University of Granada (Spain) through a blind review. This gave a validity and statistical reliability (Cronbach coefficient α of 0.8642 for $n=27$).

The survey comprised 11 items relating to the health of athletes, 16 on the promotion of health and on the implementation of the programmes proposed by the FINA, and respondent were requested to indicate whether or not their NSF had a Medical Committee, a medical representative on the Executive Board of the Federation, administrative personnel in the medical area and whether the national team was supported by a head doctor, physiotherapist, psychologist, dietician, physical trainer and other personnel to support the medical area.

All the questions were closed. For those related to the athletes' health, and for those related to health promotion and the implementation of the programmes proposed by the FINA, the items were measured on a Likert type scale from 1-5. A statistical comparison was made of the medians through the Mann-Whitney U test.

For the question on the medical personnel, the possible responses were dichotomous (yes/no). Statistical hypothesis testing was performed in equal proportions.

The description of the results included the percentages of affirmative responses for the dichotomous variables and the mean and standard deviation for the numerical responses. Unanswered questions were excluded from the analysis.

The survey was distributed online using the free software platform LimeSurvey (GNU/GPL v2) and was available at the Computer and Network Services Centre (University of Granada) from 01/10/2014 to 28/02/2015, guaranteeing the anonymity of respondents and observing the applicable EU data protection regulations. The data were imported from the UGR server, unprocessed and independently. The study was made known in person at the FINA World Swimming Championships (25m) (Doha; 29 November to 1 December 2014).

The survey was available in English, Spanish, French and Russian.

Results

The overall response rate was 64.9% (135 of the 208 NSF). The highest rate was from the NSF in developed countries (83.3% vs 56.3%). The NSF that responded to the survey represented 67,276 clubs and almost 1.4 million swimmers, of which more than 90% were from NSF in developed countries (Table 1).

Medical personnel: 27.2% of the NSF in developed countries and 37.5% of the NSF in developing countries had no medical personnel.

Table 1. Itemisation by continent of the NSF (developed / developing countries)

Type of NSF		Total NFs* (n)	Responses NFs† (n; %)		Clubs†† (n)	Licences‡ (n)
Europe	Developing	13	11	84.6	350	42.000
	Developed	38	28	73.6	53.568	704.710
	Total	51	39	76.4	53.918	746.710
Africa	Developing	49	29	59.1	668	16.318
	Developed	3	3	100	76	6.321
	Total	52	32	61.5	744	22.639
America	Developing	33	19	57.5	889	20.372
	Developed	12	11	91.6	3.718	394.487
	Total	45	30	66.6	4.607	414.859
Asia	Developing	37	17	45.9	546	19.700
	Developed	7	7	100	6.253	104.775
	Total	44	23	52.2	6.799	124.475
Oceania	Developing	9	4	44.4	18	940
	Developed	7	6	85.7	1.190	82.485
	Total	16	10	62.5	1.208	83.425
GLOBAL	Developing	142	80	56.3	2.471	99.330
	Developed	66	55	83.3	64.805	1,292.778
	Total	208	135	64.9	67.276	1,392.108

*Total of NSF (n) that are members of the FINA; †NSF that answered (n; %); ††Number of clubs within the participating NSF; ‡Number of affiliated or licensed swimmers of the participating NSF.

Table 2. Profile of the medical personnel.

	NSF developed c. n= 55 (%)	NSF in developing c. n= 80 (%)	p
Physiotherapist	58.18	31.25	0.002*
Doctor	41.82	32.5	0.266
Sport scientist	32.73	23.75	0.250
Dietician	27.27	17.5	0.174
Administrative personnel medical area	23.64	16.25	0.285
Medical committee	21.82	18.75	0.661
Psychologist	21.82	11.25	0.096**
Medical personnel on the Board of Management	12.73	12.5	0.968
Other	9.09	5	0.936

*p<0.005; ** p<0.1

58.1% of the NSF in developed countries had a physiotherapist compared to 31.2% of the NSF in developing countries (p<0.005). 21.8% of the NSF in developed countries had a psychologist in relation to 11.2% of the NSF in developing countries (p<0.1). Only one in every five NSF had a Medical Committee (Table 2: Figure 1).

Programmes: The programmes based on the prevention of drowning (prevention/learning to swim/lifesaving) were the most used by the NSF in developed countries (58.7%) and also by the NSF in developing countries (74.5%; p<0.1).

The NSF in developed and developing countries alike had few injury prevention programmes (developed 28.7% vs developing 25.4%), Medical check-ups prior to participating (20% vs 16.3%) and Injury surveillance during the championships (25% vs 27.27%). 25% of the NSF in developing countries had return to swimming programmes following injury, in comparison to 7.27% of the NSF in developed countries (p<0.05) (Table 3).

Figure 1. Profile of the medical personnel.

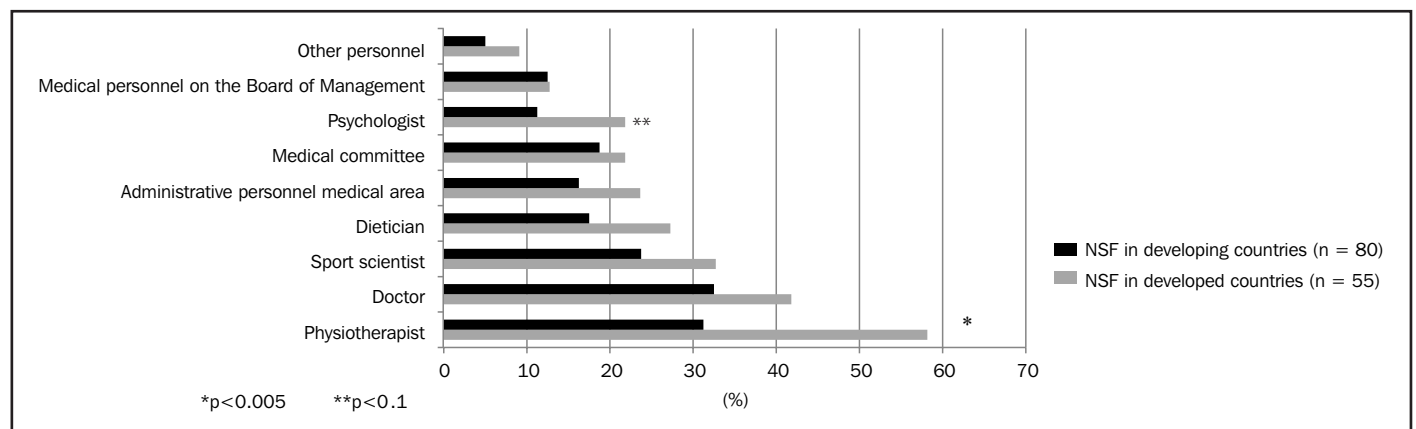
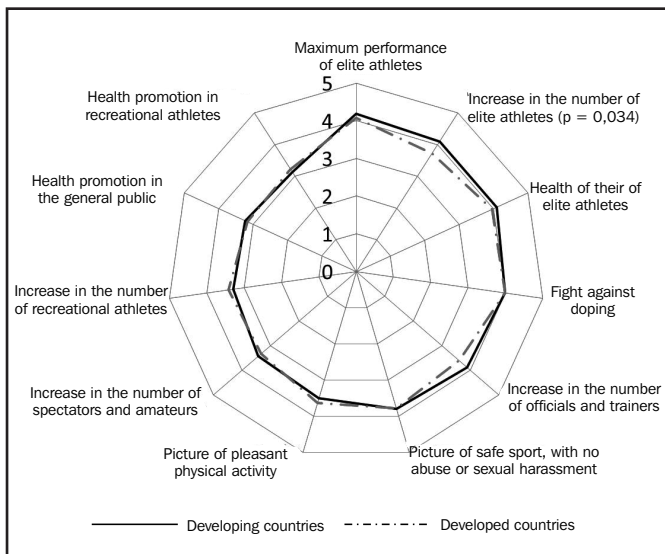


Table 3. Programmes for the promotion of healthcare, investigation activities or directives.

	NSF in developing c. n= 80 (%)	FNN in developed c. n= 55 (%)	p
Prevention of drowning, learning to swim, lifeguards	58.75	74.55	0.058*
First aid (for example on-site doctor)	37.50	30.91	0.430
Inclusion of senior citizens	33.75	21.82	0.133
Injury prevention with programmes based on swimming	28.75	25.45	0.673
Control of injuries during championships	25.00	27.27	0.767
Return to training after injury	25.00	07.27	0.008**
Pre-participation medical screening	20.00	16.36	0.593
Obesity and excess weight	18.75	20.00	0.856
Ambassador swimmers promoting health	16.25	12.73	0.566
Prevention of chronic diseases in the population	12.50	09.09	0.536

*p<0.1; **p<0.05

Figure 2. Classification of the health topics considered by the NSF.


Priorities: No significant differences were appreciated, except in relation to the Increase in the number of elite athletes ($p < 0.05$). The maximum priority for the NSF in developing countries and those in developed countries (4.07/5) was the maximum performance of the elite athlete. Both groups of NSF classified the athlete's health as the 3rd priority. The fight against doping was considered to be the 4th priority for the NSF in developing countries (3.99/5) and the 2nd for the NSF in developed countries (Table 4, Figure 2).

Discussion

Through this study, for the first time a comparison has been made of the healthcare resources of the NSF throughout the world according to their economic level, helping to present a picture of the health problems affecting the NSF. Earlier studies did not consider the economic level of the NSF, but limited their focus to those NSF with a high sporting level. These surveys were supplied on the spot at the world swimming championships and were answered by the personnel attending the event¹⁶. By

Table 4. Classification of the health topics considered by the NSF. Likert Scale (0-5).

Temas de salud	NSF in developing c.		NSF in developed c.		Contrast p
	\bar{X}	SD	\bar{X}	SD	
Maximum performance of elite athletes	4.18	1.21	4.07	1.40	0.976
Increase in the number of elite athletes	4.10	1.25	3.72	1.35	0.034*
Health of their elite athletes	4.09	1.21	3.96	1.33	0.579
Fight against doping	3.99	1.24	3.98	1.38	0.724
Increase in the number of officials and trainers	3.89	1.21	3.61	1.38	0.215
Picture of safe sport, with no abuse or sexual harassment	3.80	1.19	3.78	1.46	0.592
Picture of pleasant physical activity	3.51	1.25	3.63	1.26	0.409
Increase in the number of spectators and fans	3.44	1.23	3.33	1.33	0.725
Increase in the number of recreational athletes	3.28	1.19	3.41	1.46	0.273
Health promotion in the general population	3.23	1.25	3.17	1.33	0.815
Health promotion of recreational athletes	3.13	1.33	3.22	1.28	0.779

contrast, our study was distributed among all the NSF, being addressed to the heads of the NSF and giving ample time for their response. The questions did not refer to numbers of personnel, just to the presence or absence of the same, so as not to upset those NSF who did not have personnel in the categories studied.

Studies have been conducted on the prevention of injuries in developing countries in other sports, predominantly football¹⁷, but no study had yet been made for swimming. In the case of African football, it was concluded that injury prevention required a pragmatic approach, knowledge of, and adaptation to the resources available¹⁸ and, although care should be taken when applying the results of one sport to another, it was considered that these contributions could be useful in swimming.

In our study, the profile of healthcare-related personnel showed no significant differences between the two economic levels, except with regard to physiotherapists and psychologists, and always with values of less than 50% (except for doctors of the NSF in developed countries where the value reached 58%), despite the fact that a recommendation has been made to integrate a range of personnel in the sports medicine team¹⁹. Our results indicated that a large number of NSF did not have the necessary personnel to promote the physical and mental health of their swimmers and that they had not applied the recommendations to diagnose, treat and rehabilitate, even when sufficient financial resources were available^{20,21}. Neither did the economic level appear to be significant with regard to having or not having a Medical Committee within the organisation chart of each NSF, in order to emphasise the importance of sports medicine for athletes and to demonstrate the readiness of the NSF to progress in this field⁸.

Despite the economic divides between the NSF, no significant differences were found in their priorities, with the exception of Increasing the number of elite athletes, which was more marked for the NSF in developing countries. For both categories, the top priority was to Guarantee the best performance of the elite athlete, while the Health of the athletes was the third priority. The fact that the NSF in developing countries gave great importance to Guaranteeing the best performance of the athlete, while attending events without adequate medical support, indicated that they do not have the resources to allow them to offer the desired medical support to their athletes and many of these athletes could only be assisted by medical personnel forming part of the Championship staff.

For the NSF in developed countries, the Fight against doping was the second priority. Although the classification of this topic was the 4th priority for the NSF in developing countries, both groups gave almost identical levels of importance to this matter. This finding was to be expected given that all the governing bodies of the swimming organisations (FINA and the Continental Federations) are required, in accordance with the Code of the World Anti-Doping Agency (WADA) to adopt anti-doping measures during their national events and out of competition²². Compliance with the WADA code is also a precondition for taking part in the Olympic programme. Despite this, it was a matter of concern that the remaining 55% of the NSF did not consider doping to be a problem of top priority.

The NSF in developing countries had low levels for Injury Prevention and for return to competition following injury and very low levels in relation to the pre-participation medical Screening, however the NSF in

developed countries also had low levels and, in some cases, these were even lower. Returning to swim following an injury was more prevalent in the NSF in developing countries (25%) than for those in developed countries (7.2%) ($p < 0.05$). Despite the fact that physiotherapists play a key role in injury recovery²³, they were under-represented in the NSF in developing countries in relation to those in developed countries ($p < 0.005$).

The FINA Medical Rules emphasise the protection and promotion of the athlete's health during training and competition and the FINA conducts a comprehensive surveillance of injuries at its events^{10,11}. However, it was observed that many of the NSF were unaware of this policy, given that only 25% of the NSF in developing countries and 27.27% of those in developed countries stated that they were implementing these programmes in their own championships.

Recreational sport can be used as an activity to promote good health and also to contribute to health-related quality of life²⁴. However, up to now, the NSF have not been focussing on the Protection of the health of recreational athletes. Both NSF groups considered this problem to be either the last or penultimate priority. We believe that the lack of policies to promote the health of recreational athletes is a lost opportunity for the NSF given that there is a need to create policies to support and motivate the SF in general in order to address the health and wellbeing of non-elite athletes¹⁶.

One of these opportunities could be in the anti-doping area; this is no longer limited to professional athletes but is increasingly becoming a problem among recreational athletes²⁵. However, the NSF considered that they had more important matters than addressing the protection of the health of recreational athletes.

Governments and private institutions such as the NSF are responsible for establishing sexual abuse prevention policies to promote "Safe Sport" in which the team doctors must play an important role in the prevention and early detection of sexual harassment and abuse in sport²⁶, particularly in the "stage of imminent achievement", which is the period of maximum vulnerability of young athletes to sexual abuse²⁷. It is vital to know that prevention and the successful eradication of abuse and harassment of athletes is based on the effectiveness of the leadership of the principal international and national sports organisation such as the NSF, in our case²⁸. However, the NSF in developing and developed countries alike classified "Safe Sport" as a topic of medium priority. Only some NSF in developed countries were aware of the problem and had adopted real measures. For example, Swim Ireland²⁹, USA Swimming³⁰ and Scottish Swimming³¹, have implemented harassment-free sports policies. Swimming South Africa also initiated its own child protection policy, including legislative initiatives and guidelines on this matter by the South African government³². Existing legislation and the guidelines established in the NSF in developed countries could serve to encourage other NSF to introduce the corresponding sexual harassment and child protection policies.

Exercise in water can benefit senior citizens, by improving their quality of life and reducing disability³³; improving or maintaining the bone health of post-menopausal women³⁴, reducing the risk of chronic and cardiac diseases and improving the health of persons with diabetes³⁵. However, both categories of NSF considered that the health of the general public was a matter of low priority (penultimate and last priority

respectively). This indicates that the NSF were more concerned with the wellbeing of their elite athletes than with that of the general public. Moreover, the NSF are possibly losing the opportunity to increase the general popularity of their sport in population groups, such as senior citizens. Although global ageing is increasing³⁶, the NSF of both groups showed low levels of concern for the promotion of the health of senior citizens, given that only 33.7% of the NSF in developing countries and 21.8% of those in developed countries, had programmes directed at senior citizens. The European Swimming League (LEN) has shown its interest in taking part in activities to promote the health of senior citizens with the programme entitled "Healthy ageing and master swimming (HAMS)"³⁷, directed at developing an awareness of swimming and increasing the participation in the over-sixties category, organising a series of Pool Open Days throughout Europe. This top-down approach could encourage more NSF to implement similar programmes of their own.

The low levels of programmes based on the prevention of chronic diseases in the general public indicate that neither the NSF in developing countries (12.5%) nor those in developed countries (9.09%) considered this problem to be their responsibility, although the NSF could have a role to play, considering the high mortality rates due to chronic diseases throughout the world and the proven health benefits of swimming³⁸.

An area in which the NSF were particularly active was that relating to the prevention of drowning/learning to swim/life saving. These programmes were by far the most popular programmes among the NSF in developing countries (58.7%) and those in developed countries (74.5%) ($p < 0.1$), being beneficial to recreational athletes and to the general public. Although no bibliographic reference has been found to orientate this point of the discussion, the Drowning prevention programmes may represent sources of income for the federations and for athletes, explaining why the presence of these programmes was significantly higher in the NSF than the other programmes assessed. Unquestionably these programmes could help attract swimmers and provide a social service to prevent death from drowning.

In future studies it would be interesting to obtain information on the available resources and the expenditure criteria in the health area for both NSF groups.

Conclusions

Despite the great economic differences between the NSF, there was hardly any difference in healthcare-related personnel, and a large number of federations did not have the personnel required to promote the physical and mental health of their swimmers.

No significant differences were found in their priorities, with the exception of increasing the number of elite athletes, which was more relevant for the NSF in developing countries.

The NSF in developing countries had low levels for Injury Prevention and for return to competition following injury in relation to the pre-participation medical Screening, however the NSF in developed countries were also low and, in some cases, were even lower.

For both NSF categories, the drowning prevention programmes were the most frequent healthcare programmes, however the Health of the general public, that of Recreational Athletes and "Sport without harassment" were matters of low priority.

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Conflict of interest

The authors have no conflict of interest whatsoever.

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