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BMJ Paediatrics Open

Non-fatal child drowning death and its associated risk factors in Bangladesh: Urgent call for actionable measures

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Keywords:	Child Abuse, Child Psychiatry, Epidemiology

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3 1 *Article type: Original Research Letter*
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10 4 **Md. Jamal Hossain¹, Md. Al-Mamun², Morshed Alam³, Mst. Rukaia Khatun^{4,5}, Md.**
11
12 5 **Moklesur Rahman Sarker¹, Md. Rabiul Islam⁶**

13
14 6 ¹ Department of Pharmacy, State University of Bangladesh, 77 Satmasjid Raod, Dhanmondi, Dhaka 1205,
15 Bangladesh

16
17 8 ² Department of Sociology, Bangabandhu Sheikh Mujibur Rahman Science and Technology University,
18 Gopalganj-8100, Bangladesh

19
20 10 ³ Institute of Education and Research, Jagannath University, Dhaka-1100, Bangladesh

21
22 11 ⁴ Department of Public Health, Varendra University, Rajshahi 6204, Bangladesh

23
24 12 ⁵ Seba Nursing Institute, Chapainawabganj 6300, Bangladesh

25
26 13 ⁶ Department of Pharmacy, University of Asia Pacific, 74/A Green Road, Farmgate, Dhaka 1215,
27 Bangladesh

28
29
30
31 16 *** Correspondence**

32 17 **Md. Jamal Hossain**

33
34 18 Department of Pharmacy, State University of Bangladesh, 77 Satmasjid Road, Dhanmondi, Dhaka-1205,
35 Bangladesh

36
37 20 **Email:** jamal.du.p48@gmail.com

38
39 21 jamalhossain@sub.edu.bd

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43 23 **Keywords:** *Child drowning; Insufficient parental supervision; Seasonality; Natural calamities;*
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29 **Non-fatal child drowning death and its associated risk factors in Bangladesh:** 30 **Urgent call for actionable measures**

32 **Abstract**

33 Drowning is one of the major public health concerns, and children are the most vulnerable victims
34 of non-fatal drowning death in Bangladesh, which has been a paramount threat to child survival.
35 Based on available data and raising concerns, we intend to underline the prevalence and associated
36 risk factors for child drowning deaths in Bangladesh. According to the Center for Injury Prevention
37 and Research, Bangladesh (CIPRB), about 19,000 people of all ages drown per year across the
38 country, where approximately 77% are children (<18 years), which means that over forty
39 Bangladeshi children drown per day. As of data collected from January 2020 to June 2021, the
40 death rate of child drowning has been found to be 83%. Insufficient parental supervision, mother's
41 illiteracy, lack of swimming ability, male gender, children under five years, geographical and
42 environmental conditions, seasonality, and natural calamities significantly contribute to child
43 drowning deaths in Bangladesh. We urge the governments and local administrations to address the
44 current crisis by coordinating and integrating several effective efforts to prevent child drowning
45 deaths.

46 **Keywords:** *Child drowning; Insufficient parental supervision; Seasonality; Natural calamities;*
47 *Bangladesh.*

49 **Main Text**

50 Drowning is a significant yet frequently overlooked public health hazard in both developing and
51 developed countries. According to the World Health Organization (WHO) Global Report-2019,
52 320,000 people worldwide die every year from drowning as the world's third-leading death cause.¹
53 Drowning is the eighth most significant cause of mortality and the twelfth leading source of illness
54 burden in South-East Asia, including Bangladesh.² Over half of all drowning deaths occurs in the
55 Western Pacific and Southeast Asian region. As of data published by Unicef and the National
56 Institute of Population Research and Training (NIPRT), drowning-death accounted for over one-

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3 57 fourth (26%) and two-fifths deaths (42%) of all deaths of children aged 1 to 4 years in Bangladesh
4 58 in 2003 and 2011, respectively (Figure 1).² Notably, children aged 0 to 4 years are near three times
5 59 more likely to drown than children aged 10-17 years.³ Besides, the prevalence of death rate from
6 60 the drowning of rural children is significantly higher than urban children in the country.^{2,3}

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11 61 A survey conducted by the Center for Injury Prevention and Research, Bangladesh (CIPRB) in
12 62 collaboration with the Department of Health and Unicef reported that approximately 19,000 people
13 63 of all ages drown per year in Bangladesh. Among them, 14,500 (77%) are children.⁴ Another recent
14 64 survey performed by SoMaSHTe (Society for Media and Suitable Human Communication
15 65 Techniques) in support of Global Health Advocacy Incubator (GHAI) revealed that 83% of
16 66 children died from drowning in the last one and half years (January 2020 to June 2021), where
17 67 more than two-third (□ 69%) were below nice years (0 to 4 years = 36.66% and 5 to 9 years =
18 68 31.96%; Figure 1).⁵ The study also reported that the boys were significantly more victims from
19 69 drowning compared to the girls (60.82% vs. 38.65%), and the Dhaka (23%) and Chittagong (19%)
20 70 divisions showed the highest prevalence in terms of death rate in the country (Figure 1).⁵

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29 71 Children in low- and middle-income countries, including Bangladesh are more likely to drown if
30 72 they are not adequately supervised, male, there are no physical barriers between them and bodies
31 73 of water, and they are not proficient swimmers.^{1,2,3} In countries and regions where social,
32 74 economic, and geographic shifts occur, the risks of drowning deaths vary widely. Besides, parents'
33 75 illiteracy (no schooling) was associated with 3.7 times and 2.9 times higher risk of fatal and non-
34 76 fatal drowning, respectively, than secondary or higher-level education in Bangladesh.² Around
35 77 80% of the drowning deaths are happened due to the exposure of the natural water bodies like
36 78 ponds, channels, buckets and ditches, and within 20 meters of victim's home.^{2,4} Furthermore,
37 79 three-fifths (60%) drowning cases occur between 9 am and 1 pm, and children of large households
38 80 are riskier than children of small families.³ Particularly, children in Bangladesh's lower regions
39 81 (particularly in the southern part) are at greater risk than those in the country's higher areas because
40 82 of their geographic location. Moreover, lack of parenteral supervision and oversight, natural
41 83 calamities, lack of awareness of water safety, and unsafe behavior around water may be considered
42 84 as dominant factors behind child mortality due to drowning.^{2,3}

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54 85 The government of Bangladesh has already traced the issue of drowning as a prime concern of
55 86 children's death and initiated some pilot basis actions for child protection. However, the regular

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7 91 evident from pilot-based study that community-based supervision of young children and teaching
8 92 of swimming to older children reduced by 82% and 90% chances of drowning, respectively.⁶
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29 101 dissemination plans of this research.
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35 104 not-for-profit sectors.
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38 105 **Competing Interests**

39
40 106 None declared.
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43 107 **Contributors**

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45 108 MAM conceived the idea and MJH designed the study. MJH, MAM, MA, and MRK collected
46 109 data. MJH, MAM, MA, and MRK drafted the original version of the manuscript. MJH, MMRS,
47 110 and MRI critically revised and improved the manuscript. All authors reviewed and approved the
48 111 final version of the manuscript for publication.
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52 112 **References**

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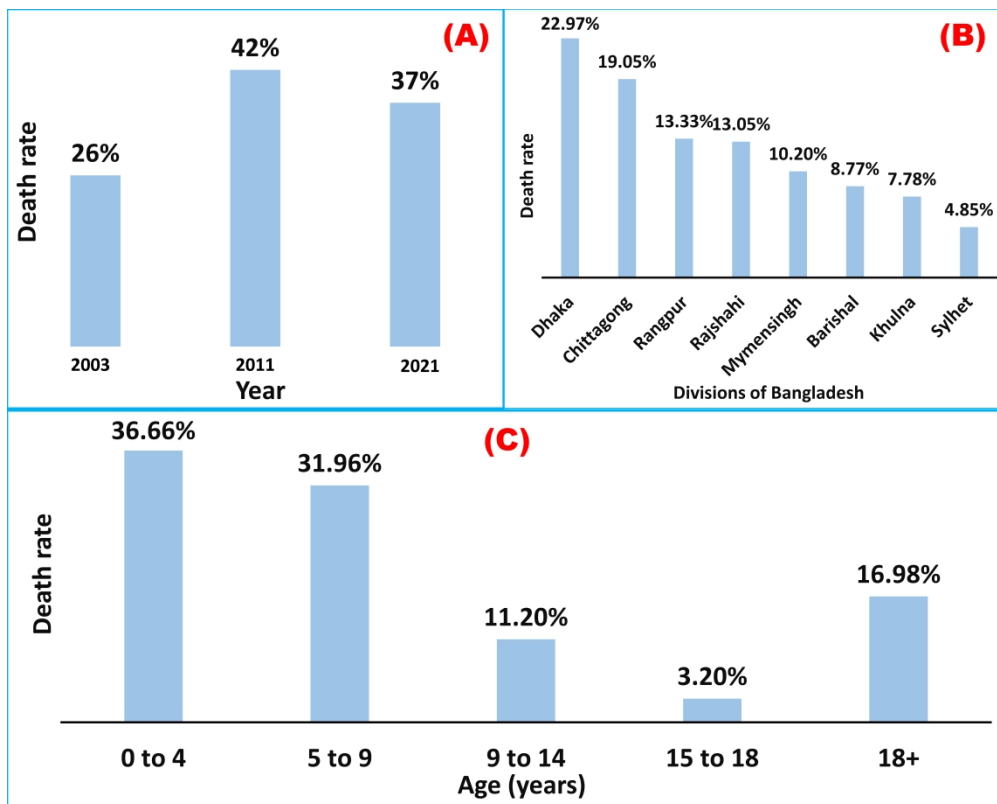
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Figure 1. (A) The prevalence of drowning death rate among children aged 1-4 years (2003 and 2011) and below 4 years (2021) in Bangladesh.^{2,5} (B) The distribution of child drowning death prevalence among the divisions of Bangladesh.⁵ (C) The distribution of child drowning death prevalence of Bangladeshi children according to age range.⁵

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Child drownings in Bangladesh: Need for action

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8 3 **Md. Jamal Hossain¹, Md. Al-Mamun², Morshed Alam³, Mst. Rukaia Khatun^{4,5}, Md. Moklesur**
9
10 4 **Rahman Sarker¹, Md. Rabiul Islam⁶**

11
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13 6 Bangladesh

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29
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31
32 17 Department of Pharmacy, State University of Bangladesh, 77 Satmasjid Road, Dhanmondi, Dhaka-1205,
33 18 Bangladesh

34
35 19 **Email:** jamal.du.p48@gmail.com

36 20 jamalhossain@sub.edu.bd
37
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29 **Child drownings in Bangladesh: Need for action**

31 **Abstract**

32 Drowning is one of the major public health concerns, and children are the most vulnerable victims
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34 available data, we intend to underline the prevalence and associated risk factors for child drowning
35 deaths in Bangladesh. According to the Center for Injury Prevention and Research, Bangladesh
36 (CIPRB), about 19,000 people of all ages drown per year across the country, where approximately
37 77% are children (<18 years), which means that over forty Bangladeshi children drown per day.
38 A recent survey reported that as of data collected from January 2020 to June 2021, 83% of
39 drowning victims were children. Insufficient parental supervision, mother's illiteracy, lack of
40 swimming ability, male gender, children under five years, geographical and environmental
41 conditions, seasonality, and disasters significantly contribute to child drowning deaths in
42 Bangladesh. We urge the governments and local administrations to address the current crisis by
43 coordinating and integrating several effective efforts to prevent child drowning deaths.

44 **Keywords:** *Child drowning; Insufficient parental supervision; Seasonality; Disasters;*
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47 **Main Text**

48 Drowning is a significant yet frequently overlooked public health hazard in both low and middle-
49 income and high-income countries. According to the World Health Organization (WHO) Global
50 Report-2019, 236000 people worldwide die every year from drowning, the world's third-leading
51 cause of injury-related death.¹ Drowning is the eighth most significant cause of mortality and the
52 twelfth leading source of illness burden in South-East Asia, including Bangladesh.² Over half of
53 all drowning deaths occur in the Western Pacific and Southeast Asian region. As of data published
54 by Unicef and the National Institute of Population Research and Training (NIPRT), drowning-
55 death accounted for over one-fourth (26%) and two-fifths (42%) deaths of all deaths of children
56 aged 1 to 4 years in Bangladesh in 2003 and 2011, respectively (Figure 1, Panel A).² Notably,

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4 58 years.³ Besides, the prevalence of death rate from the drowning of rural children is significantly
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12 63 survey performed by SoMaSHTe (Society for Media and Suitable Human Communication
13 64 Techniques) in support of Global Health Advocacy Incubator (GHAI) documented 1402 deaths
14 65 from 875 drowning incidents, where 83% (n = 1164) of victims were children in the last one and
15 66 half years (January 2020 to June 2021). More than two-thirds (□ 69%, n = 962) were below nine
16 67 years (0 to 4 years = 514 and 5 to 9 years = 448; Figure 1, Panel B).⁵ The study also reported that
17 68 boys were significantly more at risk of being victims of drowning when compared to girls (60.82%
18 69 vs. 38.65%), and the Dhaka (n = 322) and Chittagong (n = 267) divisions showed the highest
19 70 prevalence in terms of death rates in the country (Figure 1, Panel C).⁵
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28 71 Children in low- and middle-income countries, including Bangladesh, are more likely to drown if
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31 74 economic, and geographic shifts occur, the risks of drowning deaths vary widely. Besides, parents'
32 75 illiteracy (no schooling) was associated with 3.7 times and 2.9 times higher risk of fatal and non-
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106 **Competing Interests**

107 None declared.

108 **Contributors**

109 MAM conceived the idea and MJH designed the study. MJH, MAM, MA, and MRK collected
110 data. MJH, MAM, MA, and MRK drafted the original version of the manuscript. MJH, MMRS,
111 and MRI critically revised and improved the manuscript. All authors reviewed and approved the
112 final version of the manuscript for publication.

113 **References**

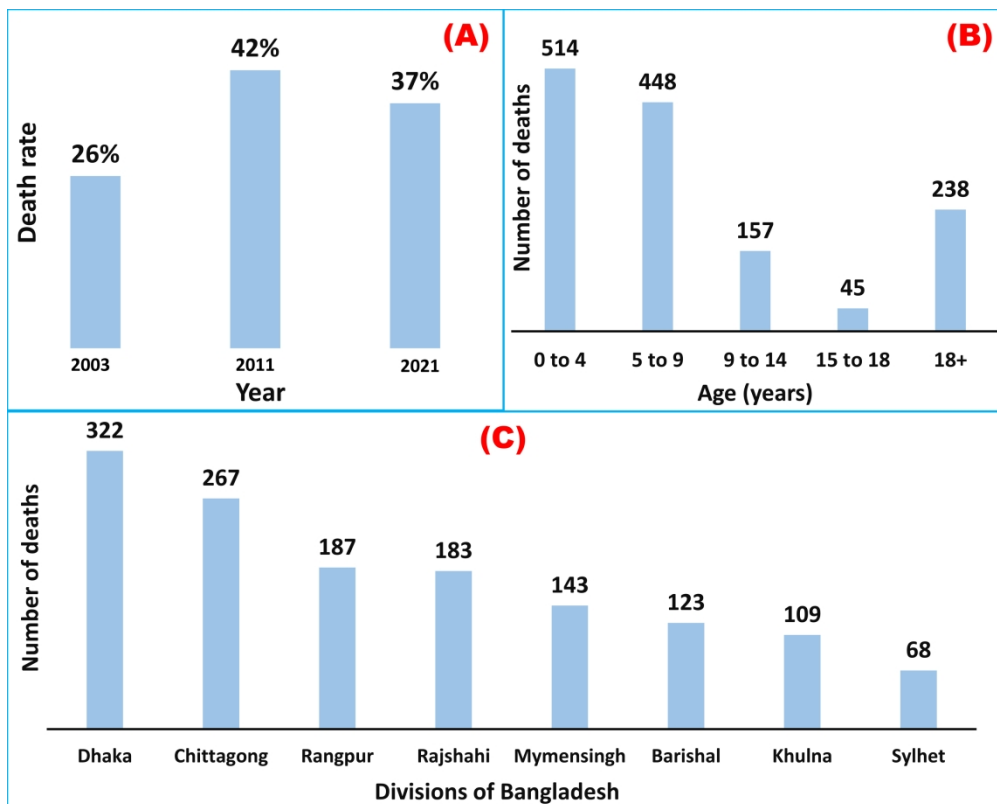
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Figure 1. (A) The drowning death rate among children aged 1-4 years (2003 and 2011) and below four years (2021) in Bangladesh.^{2,5} (B) The distribution of drowning deaths occurred among Bangladeshi children according to age range in January 2020 to June 2021.⁵ (C) The distribution of child drowning deaths among the divisions of Bangladesh in January 2020 to June 2021.⁵

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Child drownings in Bangladesh: Need for action

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Keywords:	Child Abuse, Child Psychiatry, Epidemiology

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6 2 **Child drownings in Bangladesh: Need for action**
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8 3 **Md. Jamal Hossain¹, Md. Al-Mamun², Morshed Alam³, Mst. Rukaia Khatun^{4,5}, Md. Moklesur**
9
10 4 **Rahman Sarker¹, Md. Rabiul Islam⁶**

11
12 5 ¹ Department of Pharmacy, State University of Bangladesh, 77 Satmasjid Raod, Dhanmondi, Dhaka 1205,
13 6 Bangladesh

14
15 7 ² Department of Sociology, Bangabandhu Sheikh Mujibur Rahman Science and Technology University,
16 8 Gopalganj-8100, Bangladesh

17
18 9 ³ Institute of Education and Research, Jagannath University, Dhaka-1100, Bangladesh

19
20 10 ⁴ Department of Public Health, Varendra University, Rajshahi 6204, Bangladesh

21
22 11 ⁵ Seba Nursing Institute, Chapainawabganj 6300, Bangladesh

23
24 12 ⁶ Department of Pharmacy, University of Asia Pacific, 74/A Green Road, Farmgate, Dhaka 1215,
25 13 Bangladesh

26
27 14

28 15 *** Correspondence**

29
30 16 **Md. Jamal Hossain**

31
32 17 Department of Pharmacy, State University of Bangladesh, 77 Satmasjid Road, Dhanmondi, Dhaka-1205,
33 18 Bangladesh

34
35 19 **Email:** jamal.du.p48@gmail.com

36 20 jamalhossain@sub.edu.bd
37
38 21

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41 23 *Bangladesh.*

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29 **Child drownings in Bangladesh: Need for action**

31 **Abstract**

32 Drowning is one of the major public health concerns, and children are the most vulnerable victims
33 of drowning death in Bangladesh, which has been a paramount threat to child survival. Based on
34 available data, we intend to underline the prevalence and associated risk factors for child drowning
35 deaths in Bangladesh. According to the Center for Injury Prevention and Research, Bangladesh
36 (CIPRB), about 19,000 people of all ages drown per year across the country, where approximately
37 77% are children (<18 years), which means that over forty Bangladeshi children drown per day.
38 A recent survey reported that as of data collected from January 2020 to June 2021, 83% of
39 drowning victims were children. Insufficient parental supervision, mother's illiteracy, lack of
40 swimming ability, male gender, children under five years, geographical and environmental
41 conditions, seasonality, and disasters significantly contribute to child drowning deaths in
42 Bangladesh. We urge the governments and local administrations to address the current crisis by
43 coordinating and integrating several effective efforts to prevent child drowning deaths.

44 **Keywords:** *Child drowning; Insufficient parental supervision; Seasonality; Disasters;*
45 *Bangladesh.*

47 **Main Text**

48 Drowning is a significant yet frequently overlooked public health hazard in both low and middle-
49 income and high-income countries. According to the World Health Organization (WHO) Global
50 Report-2019, 236000 people worldwide die every year from drowning, the world's third-leading
51 cause of injury-related death.¹ Drowning is the eighth most significant cause of mortality and the
52 twelfth leading source of illness burden in South-East Asia, including Bangladesh.² Over half of
53 all drowning deaths occur in the Western Pacific and Southeast Asian region. As of data published
54 by Unicef and the National Institute of Population Research and Training (NIPRT), drowning-
55 death accounted for over one-fourth (26%) and two-fifths (42%) of all deaths in children aged 1
56 to 4 years in Bangladesh in 2003 and 2011, respectively (Figure 1, Panel A).² Notably, children

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3 57 aged 0 to 4 years are near three times more likely to drown than children aged 10-17 years.³ The
4 58 risk of drowning is significantly higher in rural children.^{2,3}

59 A survey conducted by the Center for Injury Prevention and Research, Bangladesh (CIPRB) in
60 collaboration with the Department of Health and Unicef reported that approximately 19,000 people
61 of all ages drown per year in Bangladesh. Among them, 14,500 (77%) are children.⁴ Another recent
62 survey performed by SoMaSHTe (Society for Media and Suitable Human Communication
63 Techniques) in support of Global Health Advocacy Incubator (GHAI) documented 1402 deaths
64 from 875 drowning incidents, where 83% (n = 1164) of victims were children in the last one and
65 half years (January 2020 to June 2021). More than two-thirds (□ 69%, n = 962) were below nine
66 years (0 to 4 years = 514 and 5 to 9 years = 448; Figure 1, Panel B).⁵ The study also reported that
67 boys were significantly more at risk of being victims of drowning when compared to girls (60.82%
68 vs. 38.65%), and the Dhaka (n = 322) and Chittagong (n = 267) divisions showed the highest
69 number of deaths (Figure 1, Panel C).⁵

70 Children in low- and middle-income countries, including Bangladesh, are more likely to drown if
71 they are not adequately supervised, male, there are no physical barriers between them and bodies
72 of water, and they are not proficient swimmers.^{1,2,3} In countries and regions where social,
73 economic, and geographic shifts occur, the risks of drowning deaths vary widely. Besides, parents'
74 illiteracy (no schooling) was associated with 3.7 times and 2.9 times higher risk of fatal and non-
75 fatal drowning, respectively, than secondary or higher-level education in Bangladesh.² Around
76 80% of the drowning deaths occur due to exposure to ponds, channels, buckets, and ditches within
77 20 meters of victim's home.^{2,4} Furthermore, three-fifths (60%) drowning cases occur between 9
78 am and 1 pm, and children of large households (five or more children) are more at risk than children
79 of small families (less than three children).³ Particularly, children in Bangladesh's lower regions
80 (particularly in the southern part) are at greater risk than those in the country's higher areas because
81 of their geographic location. Moreover, lack of parental supervision and oversight, disasters, lack
82 of awareness of water safety, and unsafe behavior around water may be considered dominant
83 factors behind child mortality due to drowning.^{2,3}

84 The government of Bangladesh has already traced the issue of drowning as a prime concern of
85 children's death and initiated some pilot actions for child protection. However, the regular
86 epidemiological surveillance and the rigorous drive to boost awareness countrywide are still

87 unfocused. The government and all the relevant social organizations should be committed to
88 implementing a long-term national strategy based on proven interventions like establishing
89 community-based childcare institutions with daycare to curb the high incidence of drowning. It is
90 evident from a pilot-based study that community-based supervision of young children and teaching
91 of swimming to older children reduced by 82% and 90% chances of drowning, respectively.⁶
92 Besides, parents and guardians need to make sure the children understand the numerous places
93 where they could drown. Furthermore, attention and raising community awareness of proper
94 drowning rescue and resuscitation techniques should be a vital component of any program to
95 reduce the death toll in Bangladesh.

96

97 **Statements**

98 **Patient and public involvement**

99 Patients and/or the public were not involved in the design, or conduct, or reporting, or
100 dissemination plans of this research.

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104 **Competing Interests**

105 None declared.

106 **Contributors**

107 MAM conceived the idea and MJH designed the study. MJH, MAM, MA, and MRK collected
108 data. MJH, MAM, MA, and MRK drafted the original version of the manuscript. MJH, MMRS,
109 and MRI critically revised and improved the manuscript. All authors reviewed and approved the
110 final version of the manuscript for publication.

111 **References**

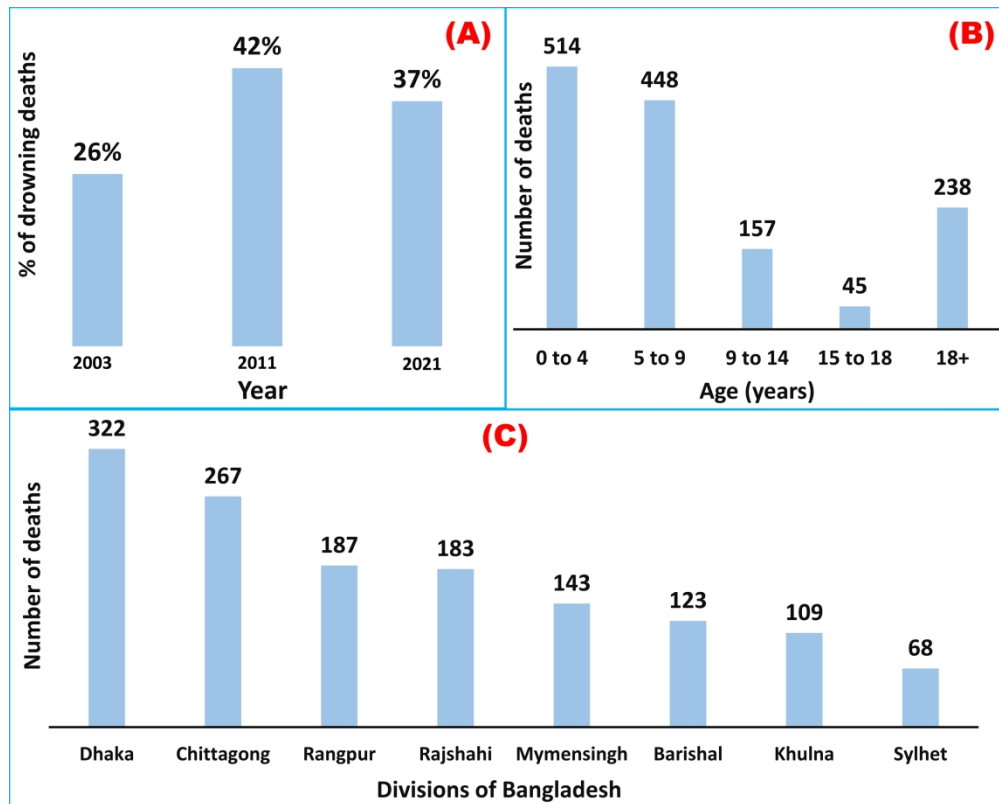
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